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From the Desk of the Editor

It is my great pleasure to bring forth the 13th edition of the PS-II Chronicles. This edition features over 733 articles from students (Pilani, Goa, and Hyderabad) sharing their experiences during II Semester of 2021-2022. This huge increase in numbers are a testimony to the usefulness of the PS- II Chronicles and its increasing popularity.

The primary aim of the PS-II Chronicles is to record the overall PS-II experiences of all the stakeholders – the students, the PS faculty and the Industry mentors.

The objectives of this Chronicles are manifold

- Prospective PS-II students can get to know about the experiences of their seniors, currently at PS – thereby increasing awareness in the student community.
- Increasing awareness among faculty about the nature of work happening at various PS-II stations.
- Bring back the experiences gained at PS-II station into academics - making the curriculum more industry relevant.

I would like to thank everyone who has participated in this activity - the students, the industry mentors and the faculties for sharing their experiences directly or indirectly. Thanks for making the 13th edition an even more bigger and better experiences.

I also would like to place my sincere thanks to Prof. Anil Gaikwad, who actually spearheaded this entire exercise since 2018 including the current edition. I would also like to thank Prof. Arun Maity, Prof. S. Murugesan and Prof. Mahesh Kumar Hamirwasia for reviewing the articles. I would also extend my thanks to Mr. Om Prakash Singh Shekhawat, and Mr. Varun Singh of the Practice School Division of BITS Pilani – Pilani Campus for their help in bringing out the edition of PS-II Chronicles.

I would be happy to receive any feedback regarding the Chronicles. Please feel free to email me at associatedeanpsd@pilani.bits-pilani.ac.in

Associate Dean

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Faculty	797
Name: Sandeep Kayastha	797
Student	797
Name: SIDDHARTH KUMAR DUBEY (2017B2A40717G)	797
Name: YASHODANANDAN NAYAK (2018A1PS0506P)	799
Name: G AALWAR SUNDARAM (2018A4PS0650H)	800
PS-II Station: Time Tooth, Noida.....	800
Faculty	801
Name: Arun Maity	801
Student	801
Name: PRATYUSH DUTTA (2020H1060137G)	801
Name: ASHWIN VASUDEVA (2020H1060211P).....	802
Name: MOTAMARRI SAI RAJENDRA (2020H1060270H)	802
PS-II Station: Trane Technologies, Bengaluru.....	804
Faculty	804
Name: Paramesw Chidamparam	804
Student	804
Name: BEVARA SATYA SIVANI (2020H1410203H).....	804
Name: M N INDRAJITH (2020H1480301H).....	805
PS-II Station: UBER, Hyderabad	806
Faculty	806
Name: Gaurav Nagpal	806
Student	806
Name: ANIRUDH GURURAJ TONASI (2018A4PS0335H).....	806

PS-II Station: UBS - Global Risk, Mumbai	807
Faculty	807
Name: Bandi Venkata Prasad	807
Student	807
Name: DHANESH A ITCHHAPORIA (2018A4PS0771H)	807
PS-II Station: UBS - Group Finance, Mumbai	808
Faculty	808
Name: Bandi Venkata Prasad	808
Student	808
Name: DEV H DESAI (2017B4A21550H)	809
Name: BALTHU SHARATH CHANDRA (2018A4PS0657H)	810
PS-II Station: UBS Business Solutions (India) Pvt. Ltd., - Group Operations, Pune	810
Faculty	810
Name: Bandi Venkata Prasad	811
Student	811
Name: YASH GUPTA (2017B4A20687P)	811
PS-II Station: Udaan, Bengaluru	811
Faculty	812
Name: Annapoorna Gopal	812
Student	812
Name: AMAN AGARWAL (2018A1PS0036P)	812
Name: UTKARSH KUMAR (2018A4PS0031G)	813
Name: RISHABH VAIDYA (2018AAPS0328G)	814
PS-II Station: Upgrad - Alumni Referral Marketing, Mumbai	815
Faculty	815
Name: Sidharth Mishra	815
Student	815
Name: SOUMADIP DE (2017B1A21757H)	815
PS-II Station: Upgrad - Career Services, Mumbai	816
Faculty	816
Name: Swarna Chaudhary	816
Student	816

Name: GADICHARLA VENKATA SAI ANIRUDH SREEVATSAV (2017B5A41122H).....	816
Name: IKSHWAK JINESH (2018A4PS0573P).....	817
Name: SAKSHI SAINI (2018B2PS1171P).....	818
PS-II Station: Upgrad - Content Strategy (Data), Mumbai	818
Faculty	818
Name: Swarna Chaudhary.....	818
Student	819
Name: NAMRATA VERMA (2017B4A40232G).....	819
PS-II Station: Upgrad - Content Strategy (Management), Mumbai	820
Faculty	820
Name: Sidharth Mishra	820
Student	820
Name: ABHYUDAYA MARYA (2020H1490839P)	820
Name: KAMALJIT KAUR BALBIR SINGH DHAMANCHALOTRA (2020H1490854P)	821
PS-II Station: Upgrad - Content Strategy (Tech), Mumbai.....	823
Faculty	823
Name: Swarna Chaudhary.....	823
Student	823
Name: ADITHYA (2017B4A41017G)	823
PS-II Station: Urban Company, Gurugram	824
Faculty	824
Name: Pradheep Kumar K.....	824
Student	824
Name: PRATEEK SINGH (2017B2A80668P)	824
Name: SHALEEN MAHESHWARI (2017B2A80986P).....	825
Name: ROHIT K BHARADWAJ (2017B4A70633P)	826
Name: DEEPAK JAIN (2017B5A30935P).....	827
Name: ARSHIT MODI (2018A7PS0191P).....	828
PS-II Station: UST Global - Trivandrum, Thiruvananthapuram	829
Faculty	829
Name: Sindhu S	829
Student	829

Name: RAHUL RAJPUT (2020H1060260H)	829
Name: SUYASH MISHRA (2020H1410210H)	830
Name: BHARATH LAL L (2020H1490825P)	831
PS-II Station: Viacom18 Media Pvt. Ltd., - Digital Ventures, Mumbai	832
Faculty	832
Name: SRINATH NAIDU.....	832
Student	832
Name: VARANASI KARTHIKEYA SHARMA (2018A8PS0775G)	832
PS-II Station: VMware Software India Pvt. Ltd., Bengaluru	833
Faculty	833
Name: Chandra Shekar R K.....	833
Student	834
Name: SHUBH MISHRA (2017B2A71647H)	834
Name: ROHAN DANIEL (2018A7PS0584H).....	835
Name: KEDAR PRIYANKA PURUSHOTTAM (2020H1030154H)	836
Name: AYUSH JAIN (2020H1120290P)	836
Name: HARSHINI N B (2020H1120297P)	838
PS-II Station: VMware Software India Pvt. Ltd., Chennai	840
Faculty	840
Name: SRINATH NAIDU.....	840
Student	840
Name: SAUBHAGYA SHUKLA (2018A7PS0535G)	840
PS-II Station: VMware Software India Pvt. Ltd., Pune.....	841
Faculty	841
Name: T Venkateswara Rao	841
Student	841
Name: AMIT KUMAR YADAV (2020H1030124P)	841
PS-II Station: Walmart Global Technology Services, Bengaluru	842
Faculty	842
Name: Vimal S P	842
Student	842
Name: RAHUL PODDAR (2017B3A70746P).....	842

Name: NIKHIL SHISHODIA (2018A7PS0038G)	843
PS-II Station: Western Digital (SANDISK), Bengaluru	844
Faculty	844
Name: Preethi N. G	845
Student	845
Name: GAHINA KARAK (2020H1030074G)	845
Name: HIMANSHU GUPTA (2020H1030121H)	846
Name: HARSHWARDHAN SINGH (2020H1030176H)	847
Name: PALKAR ROHAN JAYANT (2020H1230158G)	848
Name: MD ARIB FAISAL (2020H1230172G)	849
Name: BHAVYA KAUSHIK (2020H1230244P)	850
Name: MISHRA ABHISHEK PARMESHWAR (2020H1230325H)	851
Name: SHUBHI DUBEY (2020H1230334H)	851
Name: PANCHAGNULA PREETHIKASARAN (2020H1230344H)	852
Name: SHREYAS GHONGE (2020H1400111G)	853
Name: BANURI SHIVANI (2020H1400124G)	854
Name: VIKHE GAUTAM KAILAS (2020H1400169P)	855
Name: MUKKAVALLI VENKATA DEVI KARTHIK RAJA (2020H1400173P)	856
Name: AAKANKSHA PIYUSH GUJARATHI (2020H1400181P)	857
Name: JEEVARAAM K (2020H1400216H)	858
Name: SHRI LAKSHMI.A (2020H1400217H)	859
Name: POLICE MANOJ KUMAR REDDY (2020H1400246H)	861
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Faculty	861
Name: Benu Madhab Gedam	862
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Name: KUSHAGRA LUTHRA (2020H1060214P)	862
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Student	863
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Name: BIJIVEMULA VIJAYA SIMHA REDDY (2020H1060277H).....	865
Name: DANSON D (2020H1410082G)	866
PS-II Station: Yugabyte, Bengaluru	867
Faculty	867
Name: Jyotsana Grover.....	867
Student	867
Name: SYED AHSAN ABBAS (2017B3A70507P).....	868
Name: RAHUL GANESH PRABHU (2018A7PS0193P).....	869
PS-II Station: Zeotap India Pvt. Ltd., Bengaluru	870
Faculty	870
Name: Raja Vadhana P.....	870
Student	870
Name: MUNIGALA SHIVA (2017B3A70494H)	870
PS-II Station: Zetwerk Manufacturing Businesses Pvt. Ltd., Coimbatore	871
Faculty	871
Name: Glynn John	871
Student	871
Name: WAMORKAR MAYURESH MADHAV (2020H1410097G).....	871
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Name: Glynn John	872
Student	872
Name: MULANI SHOAIB MUNIR (2020H1060273H).....	872
PS-II Station: Zinnov Management Consulting Pvt. Ltd., (IT Project), Bengaluru	874
Faculty	874
Name: Pradheep Kumar K.....	874
Student	874
Name: PIYUSH VIG (2020H1410163P)	874
Name: RISHABH KUMAR SRIVASTVA (2020H1420189P)	875
PS-II Station: Zinnov Management Consulting Pvt. Ltd., (Non - Tech), Bengaluru	876

Faculty	876
Name: Ramesh Venkatraman	876
Student	876
Name: KARTIK KOTHARI (2018A1PS0797G)	877
Name: BALUSU KANDARPA DATTA (2018A4PS0561G)	877
Name: NEHA SAINI (2018B4PS1168P)	878
Name: AJAY GHOSH K J (2020H1060144G)	879
PS-II Station: Zluri , Singapore.....	880
Faculty	880
Name: Manoj Subhash Kakade	880
Student	880
Name: ANIRUDH SHARMA (2017ABPS0357P)	880
Name: MUKUL GUPTA (2018A4PS0596P).....	882

PS-II Station: A.T. Kearney Consulting (India) Pvt. Ltd., Gurugram

Faculty

Name: Anjani Srikanth Koka

Student

Name: ISHAN KHASNIS (2017B4AA1560H)

Student write-up

PS-II project title: Management consulting in the automotive sector

Short summary of work done during PS-II: Project 1: Cost Reduction Program - Managed certain workflows in the cost reduction program for different vehicle aggregates - Owned certain pieces of analysis to analyze cost changes with different parts and prepare business case based on that - Handled direct communication with client team as well as suppliers of different parts and negotiated with them. - Understood how large scale product cost reduction programs are run
Project 2: EV GTM Playbook - Visited various EV dealerships to understand how they operate and their business model - Researched on pricing vs range and payload to analyze how different brand price their vehicles and made recommendations on how a new entrant should price theirs. - Researched various marketing campaigns that brands launch - Analyzed total cost of ownership between EV and ICE vehicle to recommend which vehicle is better.

Tool used (Development tools - H/w, S/w): MS office.

Objectives of the project: Product Cost reduction for a player in the commercial vehicles industry, Go to market strategy for EV market in India.

Major learning outcomes: - Got a great insight into the management consulting industry.
- Understood how large scale product reduction programs are structured and run.

- Improved my communication skills.
- Learned how to analyze data and derive meaningful insights from it, while also communicating that effectively to the audience.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Kearney is an excellent place to work at. The peer group is very supportive and is ready to help at any point of time. The firm offers great quality of work to its interns as well and staffs them on client facing projects, which have very steep learning curves. The senior leadership of the firm offers great guidance, about how to navigate within the firm as well as general guidance for ones career.

Academic courses relevant to the project: Principles of Economics.

Name: PRANAV JAIN (2018A4PS0538P)

Student write-up

PS-II project title: Flagship Infrastructure Development Project

Short summary of work done during PS-II: Our team was supporting the client in their flagship infrastructure development scheme, more specifically, in strategizing and planning for the 2nd phase of the scheme as the 1st phase was nearing completion.

Tool used (Development tools - H/w, S/w): Excel, PowerPoint, SQL, Python.

Objectives of the project: Boost mobility in India

Major learning outcomes: Problem solving skills, technical skills, communication skills

Details of papers / patents: None

Brief description of working environment, expectations from the company: Great work culture and very high impact project. Company expects the student to be a quick learner and adaptable.

Academic courses relevant to the project: OS.

PS-II Station: Aditya Birla Science & Technology Company Ltd., Mumbai

Faculty

Name: Santosh Sopanrao Khandgave

Student

Name: AADITI SUSHIL BASARKAR (2017B2A10305G)

Student write-up

PS-II project title: A study on increasing the steam economy in a multiple-effect evaporator plant

Short summary of work done during PS-II: An evaporator plant can use up to 30% of the consumed energy to give the desired concentration of a product. Steam is used as a major heat load source in this evaporator plant that produces concentrated alumina solutions. This use of steam has to be optimized efficiently and further bring down the usage so that the effective steam economy will increase. This will be of both economical and resource-based profit for the plant. The study analyses and tracks down what parameters are responsible for the calculation of steam economy and how each parameter has an impact on the same. A few methods are suggested to implement on-site that theoretically show improvement in steam economy. Further to this, as an

additional study, a predictive analysis-based model is in the works to predict the total outlet of the evaporator plant in terms of strong evaporated liquor.

Tool used (Development tools - H/w, S/w): MS Word, MS Excel, MS PowerPoint.

Objectives of the project: Data analysis of factors counting in to the steam economy and principal component analysis of the same.

Major learning outcomes: Timestamped Data Analysis, Mass & Energy Balance, Predictive model building from Python.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very comfortable working environment, even though the internship was completely remote, my mentors and managers made sure they were not imposing any unnecessary tasks as important.

Academic courses relevant to the project: Chemical Process Calculations, Heat Transfer, Fluid Mechanics, Process Dynamics and Control.

Name: GURBAAN SINGH SABARWAL (2018A1PS0041H)

Student write-up

PS-II project title: Development of predictive model for relating process parameters with structures of carbon nanotubes

Short summary of work done during PS-II: Gained knowledge about CNT and CVD and undertook an udemy course to learn python and ML, Collected data of process parameters and CNT structures (length and diameter) for acetylene, ethylene and methane as a carbon source for CVD process from literatures, These models can be used for predicting properties for any new

data sets, evaluated various machine learning algorithms for prediction of CNT length and diameter.

Tool used (Development tools - H/w, S/w): Python and Machine Learning.

Objectives of the project : To create ML models to predict the length and diameter of carbon nanotubes produced using Chemical vapor deposition method.

Major learning outcomes: CNT synthesis process, Machine learning models, Python programming.

Details of papers / patents: None

Brief description of working environment, expectations from the company: A very positive and lenient working environment, had to meet the mentor once every week and that's it. Working hours also flexible. Easy to get leaves as well.

Academic courses relevant to the project: PDP, Separation processes.

Name: BHAVI JAROLI (2018A1PS0863H)

Student write-up

PS-II project title: Development of Machine Learning Model for Multi-stage Flash Evaporator

Short summary of work done during PS-II: Online WFH internship. Month-1, Knowing about the staple fibre process and where my project objective comes.

Month-2, Being through with theoretical knowledge came the developed code in hand to learn about it, learnt python and automation.

Month-3 Modifying code to understand it's working and replication to other 2 plants as first objective of project.

Month-4,5 Developing new model from scratch taking new control parameter.

Month-6 Coming with a theoretical approach to confirm if dependence on ML model is necessary or not,

In conclusion the theoretical model failed as it could not account for multiple interacting parameters, while the models replicated and developed worked fine and could be used as blueprints for replication in future requirements.

Tool used (Development tools - H/w, S/w): Python, SPYDER, Automation, Excel, Word, Aspen, Matlab.

Objectives of the project: 1) Replication of given code to 2 plants.

2) Developing new model taking steam pressure as control parameter.

3) Checking for a classic theoretical approach for prediction.

Major learning outcomes: Machine Learning ,Automation, Coding in-depth, Data analysis, Application of ideal heat equation into real case scenerio.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is professional and motivating, even though company only recruits Ph. D and M. Tech graduates they still motivated and helped me learn a B. E. student to the best of their capabilities, developing a professional sense of work despite the internship being online.

Academic courses relevant to the project: Heat Transfer, Thermodynamics, Fluid mechanics.

PS-II Station: Adobe Systems, Bengaluru

Faculty

Name: Vimal S P

Student

Name: PRATYUSH BANERJEE (2018A7PS0312H)

Student write-up

PS-II project title: Analytics Library Integration & Dynamic Alert Thresholds

Short summary of work done during PS-II: Analytics Library Integration 1. Comparison of new library with existing library 2. Integration of new library for sending analytics events in place of an existing library in C++ 3. Creating test cases for code changes 4. Rolling out to users using feature flags.

Dynamic Alert Thresholds 1. Research on various time series analytics techniques 2. Comparing models for current use case 3. Implementing and tuning models 4. Automation for generating and updating dynamic thresholds.

Tool used (Development tools - H/w, S/w): C++, Apache Hive, Splunk, Python, Jenkins, Git, Xcode, VS Code.

Objectives of the project: 1. To integrate a new library for sending analytics events related to cloud sync. 2. To create dynamic thresholds for alerts using Machine Learning techniques.

Major Learning Outcomes: Analytics Library Integration

1. Testing various scenarios to gauge performance and utility
2. Managing tradeoffs and taking design decisions
3. Software testing and rollout principles

Dynamic Alert Thresholds

1. Evaluating tradeoffs between ML techniques
2. Process automation

Details of papers / patents: None

Brief description of working environment, expectations from the company: Excellent working environment, supportive and helpful manager, mentor and team members, flexible working hours as well as focus on learning new technologies and skills.

Academic courses relevant to the project: Data Structures & Algorithms, Object Oriented Programming, Database Systems, Operating Systems, Applied Statistical Methods, Deep Learning.

Name: SAMINA SHIRAJ MULANI (2018A7PS0314P)

Student write-up

PS-II project title: IntelliStyle

Short summary of work done during PS-II: My work consisted of contributing to the development of a feature for automating styling of content in InDesign. I worked on the backend aspects (strengthening the current implementation and adding more enhancements) and some of the frontend as well. Codebase was primarily C++. InDesign has its own Document Object Model and way of running scripts in JSX, which were leveraged for the purpose.

Tool used (Development tools - H/w, S/w): C++, Git, JSX, Postman, Xcode.

Objectives of the project: The objective of the project was to develop and refine some of the backend and frontend pieces of a feature that aims to automate the process of styling textual content in the product InDesign.

Major learning outcomes: Good code practices and development in a professional environment. Greater knowledge of low level C++ constructs and usage.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The internship was entirely remote. People are helpful and make you feel comfortable in the environment. I also got to attend the Tech Summit which happened in May, which was pretty great. Workload wasn't stressful.

Academic courses relevant to the project: Yes, OOP was pretty relevant as I saw many design patterns in use.

Name: ANSH GUPTA (2018A7PS0338H)

Student write-up

PS-II project title: Smart Copy & Paste feature

Short summary of work done during PS-II: Studied and analysed various research papers relevant to the problem statement. Then, worked on a deep learning model to improve the processing of transparent objects present in an image, when we paste it over a new background. Also developed a sample application for macOS, which integrated the deep learning model developed in order to demonstrate a working prototype of the solution. Further details cannot be shared as the solution developed has been filed for patent.

Tool used (Development tools - H/w, S/w): Python, Photoshop, Objective-C, xCode, VS-Code, AWS, PyTorch, Tensorflow, CoreML, Microsoft Suite.

Objectives of the project: To improve the copy-paste workflow by processing the transparent objects of an image properly.

Major learning outcomes: By the means of this internship I was able to work in the field of deep learning and application development. This internship helped me improve my technical as well as professional skills.

Details of papers / patents: A patent has been filed for the solution.

Brief description of working environment, expectations from the company: Adobe is a great company to work for. Everyone is always ready to help and guide you at every step of your internship. Your mentor is very approachable. The University Recruitment team organises various events to make the internship fun and enjoyable. I got a chance to visit the Noida office, the office is really beautiful and very lively. Overall it was a really great experience to intern at Adobe Systems.

Academic courses relevant to the project: Machine Learning, Deep Learning, Software Engineering, Data Structures and Algorithms.

Name: PRANAVI MARRIPUDI (2018A7PS0507H)

Student write-up

PS-II project title: Data Driven Recommendations

Short summary of work done during PS-II: Worked on data collection, many ML models like KMeans, decision trees, MLP, GPT3, and so on. Integrated this model with the codebase.

Tool used (Development tools - H/w, S/w): Python, React, JavaScript.

Objectives of the project: Recommendations have become very popular for increasing customer engagement and retention. With many recommender systems available it becomes equally important to rank these recommendations. Using ML / AI and user data design a model to show sensible, sma.

Major learning outcomes: Learnt about various recommender systems and how to provide increased personalization to users. Understood how to design and implement solutions to technical problems from scratch.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The company has a very friendly working environment. All the team members are always approachable and ready to help. You are expected to finish your assigned tasks on time.

Academic courses relevant to the project: Machine Learning, Information Retrieval.

PS-II Station: AFour Technologies Pvt. Ltd., Pune

Faculty

Name: Srinath Naidu

Student

Name: ADIT GANDHI (2018A7PS0575H)

Student write-up

PS-II project title: AI ML Training

Short summary of work done during PS-II: Learnt about various Machine Learning Algorithms and create notebook and documentation for them. learn about AWS services like Forecast, Comprehend, Lex, etc.

Tool used (Development tools - H/w, S/w): Software - Google Colab, Visual Studio, Jupyter Notebook, AWS services.

Objectives of the project: Learnt about various ML topics and create documentation and python notebook for them.

Major learning outcomes: Various algorithms for ML, time management, Increase in Python Language knowledge.

Details of papers / patents: None

Brief description of working environment, expectations from the company: We had a great learning environment where we had a daily meets discussing our learnings teaching our team members and learning from them. Team leader was very active and helping at every turn so we are not stuck anywhere.

Academic courses relevant to the project: Software Engineering, Data Structures and Algorithms.

PS-II Station: Airmeet - Business Analysis & Strategy, Bengaluru

Faculty

Name: Anjani Srikanth Koka

Student

Name: AGRAWAL ROHAN RATAN (2017B1AB1045P)

Student write-up

PS-II project title: Building an Automated Web Data Scrapping Model and Competiton Benchmarking

Short summary of work done during PS-II: Made newsletter of the above mentioned activities and send that to the stakeholders. This was a monthly task that has to be done. Other work done

on competition was a project that ran for almost the whole PS, but cannot mention due to confidential reasons. Was working on this project since the PS done in the last semester at Airmeet.

Tool used (Development tools - H/w, S/w): Python, Hubspot, Tableau.

Objectives of the project: Objective was to keep update to about about the competitive product and their features, so as to not loose out on the market and to automate multiple tasks that reduces manual efforts. For instance, automating the profile extraction of the participants.

Major learning outcomes: Learnt python libraries, competition benchmarking, communication skills, team work.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company : The company was remote. The hours were not defined, had to work sometimes late hours, but there were days when the work was going smoothly.

Academic courses relevant to the project: DSA.

Name: AMADHYA JAIN (2017B4A11023G)

Student write-up

PS-II project title: Founder's Office - Business Analysis and Strategy

Short summary of work done during PS-II: The project involved everything under the sun that you can expect at a strategic role. I've handled and made materials for investor calls, ran RCA exercises, worked on improving conversions across the funnel, researched acquisition opportunities etc.

Tool used (Development tools - H/w, S/w): Tablea, Hubspot, Chargebee, Excel, 10xGoals, SQL

Objectives of the project: This project involves performing market and industry research, and building go-to market strategies. This requires a thorough process of documenting ongoing tasks, analysing other virtual-events platforms, studying who's our ideal customer and how we could attract them.

Major learning outcomes: How to conduct oneself in a professional environment, communicating with stakeholders, crisis management, Excel, Vlookup, Tableau,SQL, Strategic Mindset, Looking beyond numbers, research.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work can be gruelling at times, at Founder's Office, it's always a crisis management situation and you might be required to work long hours, sometimes sacrifice weekends and holidays. You get to work at the same scope as an employee, directly correspond with stakeholders and freedom to run your own exercises. A lot of ownership is up for grabs but the expectations are equivalently high.

Academic courses relevant to the project: POE, TRW.

PS-II Station: Airmeet - Business Development, Bengaluru

Faculty

Name: Anjani Srikanth Koka

Student

Name: BANDI BHAVANI SATISH (2018A8PS0584G)

Student write-up

PS-II project title: Business Development and growth at Airmeet

Short summary of work done during PS-II: Conducted market research on a wide range of domains such as IT and Media for over 4000 companies, aiming to partner with the firm as a potential client. Involved in gaining hands-on with HubSpot for Inbound marketing, sales, and lead generation. Devised marketing strategies for the firm's products across various businesses and organizations. Succeeded in pitching demos of the platform to clients across IT and Media sectors and gained experience in handling real-time corporate issues.

Tool used (Development tools - H/w, S/w): Hubspot, Apollo, Excel, LinkedIn.

Objectives of the project: This project aims to generate ideas to increase user data and help businesses and organizations collaborate with Airmeet's platform to stand competitive in the market. Identify different channels to onboard a new user base in AIRMEET. Own customer journey.

Major learning outcomes: Market research, sales development, improved communication skills, learnt about Hubspot, apollo and LinkedIn.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Company works on a remote model, so its WFH even in Non-COVID situation. Flexible working hours, managers and mentors are extremely friendly and helpful. Work environment allows you to explore other areas of your interest and not just the duties related to your title. Positive and encouraging work environment.

Academic courses relevant to the project: Principles of Management, Professional Ethics.

PS-II Station: Airmeet - Data Analytics, Bengaluru

Faculty

Name: Anjani Srikanth Koka

Student

Name: KANDELA VISION REDDY (2018A2PS0157H)

Student write-up

PS-II project title: Enhancing the performance of Airmeet using data analytics

Short summary of work done during PS-II: I've worked on many analytical tasks and created multiple dashboard which serves different teams.

Tool used (Development tools - H/w, S/w): SQL, TABLEAU, EXCEL.

Objectives of the project: Serve multiple teams with their day to day tasks.

Major learning outcomes: Leading a team or project.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working hours were flexible and they expect us to know SQL before hand.

Academic courses relevant to the project: NA



Name: NADAR THERI ADITHYA MARIAPPAN (2020H1420199P)

Student write-up

PS-II project title: Enhancement of airmeet product using data analytics

Short summary of work done during PS-II: Understanding stakeholder requirements, data collection and preparation, data visualization, analysing data and insights generations, communicating it back to stakeholder and automating it for future reference.

Tool used (Development tools - H/w, S/w): SQL, Tableau, Power BI, Ms office, AWS.

Objectives of the project: To perform data analytics.

Major learning outcomes: Analysing data and insights generations.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Wide knowledge about executing SQL Queries, good communication skills with stakeholders, medium knowledge about visualization tools. Insights generation plays a vital role in data analysis.

Academic courses relevant to the project: NA

PS-II Station: All Rounder Cup (Melio) - Non-Tech, Bengaluru

Faculty

Name: Raghuraman S

Student

Name: THAKKAR KARAN ARVINDKUMAR (2018A3PS0245G)

Student write-up

PS-II project title: Competitions Management

Short summary of work done during PS-II: Working as an SSP is always interns main Objective. SSP means Screen Sharing Partner. We have to host the quiz on Kahoot and children will join platform via link. Apart from that we have to frequently edit slides and audio for children and create question bank for quizzes as well.

Tool used (Development tools - H/w, S/w): Kahoot.com, Quizizz.com, Canva

Objectives of the project: Making online quiz game for Class 1 to 8.

Major learning outcomes: Because of the amazing atmosphere of organization created by the AllRounder Cup my communication skills are improved. Using Canva for creating presentation slides, my presentation skills have improved.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The environment is very good in company. Everyone is friendly to each other because ARC have to make quizzes for children. So people frequently try to remember their past memories as children so that they can understand children's mentality better and make relevant fun quiz for kids.

Academic courses relevant to the project: Requires basic knowledge of subjects from class 1 to 8 and editing skills.

Name: SIDDHARTH MISHRA (2018A8PS0452P)

Student write-up

PS-II project title: Competitions Management

Short summary of work done during PS-II: Managing Melio's competitive team was my primary responsibility. My duties included designing and launching new challenges, setting up the challenges' whole back-end, and improving the already-existing challenges. In addition to this, I was able to spend some time working on products and product marketing. When I started, the team was still very small, so I had more opportunities to focus on topics like business development.

Tool used (Development tools - H/w, S/w): G-Suite, Excel, Google script.

Objectives of the project: Control the competition team.

Major learning outcomes: I had first-hand experience with starting a firm, managed a number of my own projects, and saw how major business decisions were made.

Details of papers / patents: None

Brief description of working environment, expectations from the company: While creating Swiggy, the company's founders met. Overall, it offers a wonderful learning curve in a very laid-back environment. The full-time staff treat the interns with the same respect and assign them the same duties. As a result, you are responsible for your work as well.

Academic courses relevant to the project: OOP, Computer Programming.

PS-II Station: AlmaConnect, Gurugram

Faculty

Name: Mahesh K Hamirwasia

Student

Name: AISHWARYA PRATAP SINGH (2018A1PS0085G)

Student write-up

PS-II project title: Jobs Roles at AlmaConnect

Short summary of work done during PS-II: First month was dedicated to prospect research. Second prospect research and job consultancy. Third month was prospect research intern handling and job editing. Fourth month was Jobs editing publishing promotion. And Fifth month was teaching ps1 students about jobs module.

Tool used (Development tools - H/w, S/w): Google sheets, Lusha prospecting tool, Freshdesk.

Objectives of the project: To cover about the various job roles that were given to the trainee through the course of the training session.

Major learning outcomes: Communication skills, time management, data handling, client handling, intern management.

Details of papers / patents: Company MOU for jobs consultancy.

Brief description of working environment, expectations from the company: Easy work not technical, freedom in working hours though a lot of work load to handle.

Academic courses relevant to the project: Business operation and management.

Name: SHOBIT PANDITA (2018A5PS0967P)

Student write-up

PS-II project title: Identifying Institutes and Creating a Viable Database for Advancement Assistance

Short summary of work done during PS-II: Managed AlmaConnect news product and worked with several clients to ensure functioning of the product. Working in marketing and reaching out to potential clients. Creating database for pitching and trial of new products. Maintenance of AlmaConnect social media product for institutes and organizations. Worked with many members and interns in the organization. I interacted with various other interns and checked the work to be finally submitted to the organization.

Tool used (Development tools - H/w, S/w): NA

Objectives of the project: To aid the organization in rolling out new products and their maintenance.

Major learning outcomes: Learnt work in operations and improved management skills with hands-on experience.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was positive. Some disadvantages may exist due to the online-mode and reduced coordination at times. Those working in the organization are helpful and responsive to queries. The interns are managed well by various members of the organization. The assigned work is explained well.

Academic courses relevant to the project: NA

PS-II Station: Amazon - Machine Learning, Hyderabad

Faculty

Name: Seetha Parameswaran

Student

Name: ZAWAR RUSHIKESH BALKRISHNA (2017B1A70977P)

Student write-up

PS-II project title: Fraud detection in online order concessions

Short summary of work done during PS-II: Developed machine learning methods to make a fraud detection system that can detect online orders that might claim for false concessions or return damaged or different products.

Tool used (Development tools - H/w, S/w): Python, SQL, etc.

Objectives of the project: Detect frauds in online orders.

Major learning outcomes: Machine learning methods and working with large datasets.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Remote work. No restriction on time of the day, so I can work anytime I want. Expectations were realistic and the people were quite understanding.

Academic courses relevant to the project: Machine learning, Computer programming, Database systems, etc.

Name: MANAN SONI (2017B4A70495P)

Student write-up

PS-II project title: Scalable Customer Anecdote Mining

Short summary of work done during PS-II: My major work was in the domain of Natural Language Processing. I trained and evaluated multiple models. Also suggested changes to the existing pipeline - including changes to data ingestion techniques and model architectures. Also worked on alternative architectures that were based on the Metric Learning framework.

Tool used (Development tools - H/w, S/w): Python (PyTorch, sklearn, huggingface), AWS SageMaker.

Objectives of the project: Check feasibility of converting the current multi-model setup into a unified single-model architecture.

Major learning outcomes: Learnt a lot about how Deep Learning models are trained, validated and evaluated at Amazon's scale.

Details of papers / patents: Submitted one paper to Amazon's internal ML conference.

Brief description of working environment, expectations from the company: The working environment at Amazon was excellent. The people that I worked with were extremely smart and hard-working. They were also very knowledgeable and encouraged new ideas. Sometimes, I needed to work overtime to finish pending work and I was encouraged to take up multiple projects at the same time. But overall, the workload was manageable and I got to learn a lot from the internship.

Academic courses relevant to the project: No course particularly, but you should be comfortable with coding state-of-the-art papers and should be able to read research papers.

Name: PRAKHAR SURYAVANSH (2017B4A71017H)

Student write-up

PS-II project title: Demand Forecasting

Short summary of work done during PS-II: The work done involved extracting the relevant data from the overall dataset of digital order items data. The table contains information of every order item and corresponds to a single ASIN identified by DO_ITEM_ID. We identify each item using ASIN which is Amazon Standard Item Number sometimes also known as Amazon Standard Identification Number. ASIN is Amazon's SKU used to uniquely identify all products in Amazon's worldwide catalog. After extracting the relevant data, the Machine Learning models were created to train the data for predicting demand.

Tool used (Development tools - H/w, S/w): Python.

Objectives of the project: One of the most common metrics used by any business to optimize price is demand. In this age of digital transformation, optimizing predictive modelling for demand forecasting requires the consideration of an increasingly complex web of variables.

Major learning outcomes: During the work, I learnt about handling the dataset and various machine learning algorithms including Linear Regression, Logistic Regression and K Nearest Neighbor.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: This work involved a lot of research as it was to be done from scratch. The research involved studying about

what type of Machine Learning models can be used, how similar problems have been solved in the past and some research papers involving similar domain.

The product development was completely new and done from scratch. Testing involved a team of people constantly reviewing the code and giving feedback.

Efficiency was improved from time to time after receiving feedback and trying different things.

Academic courses relevant to the project: Machine Learning.

Name: AVINASH MANOJ SONTAKKE (2017B5A70667P)

Student write-up

PS-II project title: Multilingual model for predicting replenish-able products

Short summary of work done during PS-II: Created a Proof of Concept to utilise multilingual NLP model such as XLM-R and mT5 in a binary classification model to predict whether an item is replenish-able or not. The project involved literature review of the various multilingual NLP models and selecting one based on the requirements. The project also involved data preparation and cleaning along with feature engineering. The final steps were model training and analysing their performances and areas of error.

Tool used (Development tools - H/w, S/w): Python, Spark, AWS, Jupyter notebooks.

Objectives of the project: Create a Proof of Concept where a multilingual model along with a classifier can be used to predict replenish-ability of items in Amazon's catalog.

Major learning outcomes: AWS ecosystem, Dataset preparation and cleaning, Model training and hyperparameter tuning, AWS computing, Error analysis in model training, Effective documentation and coding practices.

Details of papers / patents: The project work has spawned ideas for papers that can be presented in the future.

Brief description of working environment, expectations from the company: The internship was WFH which was beneficial since the team was split between the US and Indian timezones. The working environment is very healthy as the entire team is interested in your work and provides active feedback and suggestions to your problems. No one is expected to work really late. The expectations from the company are that you provide regular updates and involve yourself in the stand-ups and sync-ups.

Academic courses relevant to the project: Data Mining, Machine Learning, Information Retrieval.

PS-II Station: Amazon Development Center, Bengaluru

Faculty

Name: Ashish Narang

Student

Name: MASHRU HARSHIT SANDEEP (2017B1A70792P)

Student write-up

PS-II project title: Tax system modifications

Short summary of work done during PS-II: Made the tax system of the Amazon Marketplace in the seller side much more efficient in storing data between different systems of the taxing Ecosystem.

Tool used (Development tools - H/w, S/w): Java, JavaScript, HTML, Angular, System Design, Data Structures, Algorithms.

Objectives of the project: To make the seller side taxing system of the Amazon marketplace much more efficient.

Major learning outcomes: Java, System Design, JavaScript, Angular, Soft Skills, Writing Skills.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Very positive and helpful team that encouraged me throughout the course of the internship. They helped me when I faced a new challenge that turned out to be a blocked. It was a pleasure working for my team "Taskless".

Academic courses relevant to the project: OOP, DSA, DBMS.

Name: ASHISH KUMAR (2017B1A70854P)

Student write-up

PS-II project title: Upgrading encryption / decryption subroutine for preferences system

Short summary of work done during PS-II: Worked on the project - upgraded library dependencies to latest versions - resolved some tickets.

Tool used (Development tools - H/w, S/w): Java. IntelliJ Idea.

Objectives of the project: Upgrade encryption / decryption subroutines to comply with the policy.

Major learning outcomes: Java, Development practices

Details of papers / patents: None

Brief description of working environment, expectations from the company: Excellent

Academic courses relevant to the project: OOPS.

Name: TUSHAR AHOOJA (2017B1A70987P)

Student write-up

PS-II project title: Disassociating the various solution layers of the architecture

Short summary of work done during PS-II: To design the architecture of the system in such a way that latency is less, the throughputs is high, transactions per second are more, idempotent messages are handled and the various solutions layers of the architecture are loosely coupled with respect to each other.

Tool used (Development tools - H/w, S/w): Java in IntelliJ, Postman, Internal amazon tools.

Objectives of the project: To design the architecture of the system in such a way that latency is less, the throughputs is high, transactions per second are more, idempotent messages are handled and the various solutions layers of the architecture are loosely coupled with respect to each other.

Major learning outcomes: Learning best practices being used in industry, writing clean and effective code, exposure in a MNC.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment was very good. The project which we were working on was a green field project, so everyone including my manager had very prior knowledge about the project, as a result had a lot to learn. The entire team was also very supportive and friendly.

Academic courses relevant to the project: OOP, Java.

Name: YATHARTH SREEDHARAN (2017B2A30517P)

Student write-up

PS-II project title: Transient Compute & External Orchestration

Short summary of work done during PS-II: Created a library that can be used to migrate workflows running on long running clusters to transient clusters. Orchestration of this workflow is done using a serverless step functions. One workflow as a proof of concept was completely productionised to run on transient cluster using the aforementioned library. Templated the application code for better reusability.

Tool used (Development tools - H/w, S/w): AWS - Step functions, EMR, S3, Lambda.

Objectives of the project: Migrating big data workflows running on long running clusters to transient clusters orchestrated by AWS step functions.

Major learning outcomes: Big data architectures, AWS.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Completely work from home. Daily standups and weekly 1:1 with mentors. Working hours are flexible but most of the team worked from 10-6 PM.

Academic courses relevant to the project: Object oriented programming.

Name: SHAH SHREY TARUN (2017B2A71038P)

Student write-up

PS-II project title: Self Service Data Store

Short summary of work done during PS-II: Created DynamoDB table through AWS SDK -
Created codec files for communication between DynamoDB table and Java objects.
Created CRUD (Create, Read, Update and Delete) REST APIs that interact with the backend and does the required operation with DynamoDB table.
Migrated data from older DynamoDB table to the new DynamoDB table.

Tool used (Development tools - H/w, S/w): Java, DynamoDB, AWS SDK, Mockito, git, Amazon Development tools (Brazil, CRUX).

Objectives of the project: To model and create the DynamoDB table that will be maintained instead of maintaining the multiple database instances.

To maintain historical versions of data using DynamoDB streams and AWS lambdas.

To implement AWS lambdas.

Major learning outcomes: Learnt how to design and implement DynamoDB table and access patterns

- Learnt to write and execute AWS Lambda functions
- Learnt to write REST APIs
- Learnt unit testing in Mockito
- Learnt about development tools at Amazon

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment in my team was supportive. The project had realistic expectations and my mentor pushed me to design and write code of the highest standards. The expectations from the Company were to complete the deliverables that were planned for an internship. Overall, the expectations were such that they push you for betterment.

Academic courses relevant to the project: Object Oriented Programming, Data Structures and Algorithms, Database Systems.

Name: KESHAV SETHI (2017B3A30657P)

Student write-up

PS-II project title: Pricing Document Explorer

Short summary of work done during PS-II: Document explorer consists of two parts - schema viewer and query constructor. Schema viewer helps user to go through the schema with descriptions and its arguments. Here most of my learning were in knowledge of graphql and its features. It also involves a lot of product development and management. Query constructor is platform where user can easily construct graphql queries by clicking checkboxes, it involves usage of AST and design patterns. Here I learnt design principles and its usage in real world along with a lot of usage of algorithms.

Tool used (Development tools - H/w, S/w): Java, React, Spring, AWS.

Objectives of the project: Document explorer smoothen the document and schema viewing and query construction experience. It caters to all kinds of audience and clients both tech and non tech. It also improves on boarding experience and introduce new hires to the schema architecture.

Major learning outcomes: GraphQL, Project Management, ReactJS, Unit and Integration testing.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Supportive and great team with lots of flexibility.

Academic courses relevant to the project: DSA, OOP, DBMS, CP.

Name: KSHITIJ GUPTA (2017B3A70601P)

Student write-up

PS-II project title: Experiment dashboard

Short summary of work done during PS-II: "Experiment Dashboard" was a full stack project. It required me to develop the frontend of the dashboard, backend APIs and subsequently integrating them (<https://quip-amazon.com/ltSYA9bBDx5b>). The project involved three major milestones. First, to display all the configurations of a given experiment, in a user-friendly table. The table contains information about config values (control and treatment), config key, hierarchy (Region, Marketplace, Merchant, GL, Lister) and context key-values. This table supports options like sorting and searching. Second, to validate if "ACTION_LIST" configuration is set for the lab, if not then display a warning message to the user. Third, to display lab metadata like Implicit/Explicit Trigger, SES/Manual lab on the dashboard. For completing all these milestones I developed different APIs using coral service. Furthermore, separate react components are created for each milestone and are added to the main Dashboard component. Every API is integrated to the frontend by following the best coding practices by using reducer and actions. For each API and the frontend UI, unit test and integration test were written.

Tool used (Development tools - H/w, S/w): Tools: IntelliJ, AWS

Objectives of the project: Experiment Dashboard aims to present all information regarding experiment configurations and metadata to the customers at one place. It also aims to perform certain validation checks to see if a lab is set up correctly or point out misconfigurations.

Major learning outcomes: Java, Spring, React, Redux, Coral Services, DiamondToolkit, Mockito.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment was very good. The team was very supportive and friendly. It was expected that intern should complete their project in the given time.

Academic courses relevant to the project: Object oriented programming.

Name: GODHALA MEGANAA (2017B3A70973H)

Student write-up

PS-II project title: Amazon fraud detector as the fraud evaluator

Short summary of work done during PS-II: The main project for the internship is based on integrating Amazon Pay with Amazon Fraud Detector which is an AWS based fraud vendor which uses ML and deep learning to build fraud models. The model which we are planning to use currently is the Transaction Fraud Insights model which has been recently launched by AFD team. Previously Amazon Pay has been tested with AFD using the 'Online Fraud Insights' model in shadow mode and tested in production for various use cases. Due to IMR constraints it has been dialed down. Hence the major steps involved in achieving this would include data-extraction based on historical fraud data available, decide on important features that will improve the performance of the model, build and train the model, make decision rules to evaluate outcome based on the performance metrics of the model, build a detector with defined set of rules and finally integrate the model with Oreo which interacts with third party fraud vendors.

Tool used (Development tools - H/w, S/w): JAVA, AWS, S3, Amazon fraud detector.

Objectives of the project: Integrate Amazon fraud detector with Amazon pay to evaluate buyer fraud risk.

Major learning outcomes: There are a numerous learning outcomes from the project which include, learning the optimistic query to run a job to extract training data efficiently and understanding different ways to outsource the data from other teams. Finding the most important

columns that will be used in model training to evaluate fraud buyers , which required understanding the important variables that are actually required and a trade-off between the variables that can be populated at the time of order confirmation. The model also requires encrypting some of the fields and pre-process the data columns to obey the constraints set by Amazon fraud detector in order to successfully train the model. Finally understanding the architecture of fraud evaluation that takes place in the packages of Amazon Pay and how the fraud check is done, inspired me to understand how different micro-services integrate with packages through some api's and their function.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: As part of my internship at amazon I work in the team of Amazon Pay which is regarded as a tier-1 service for providing payment services to various merchants and third-party transactions across the world. As of now my team integrates with payment solutions across United States and operates the back end development phase of Amazon Pay. Hence any changes or development that takes place here is of utmost importance since it's a tier-1 service which directly affects the revenue of the company.

My role as a software development engineer Intern in Amazon pay TPM/CX involves to understand the goals and requirements of my team in improving the services and solving the high priority risks associated with the charge service API's and Fraud evaluation tasks related to Transactions that are handled by my team.

Academic courses relevant to the project: ML, OOPS, IR.

Name: BANDEWAR ANJALI SUDHAKAR (2017B4A30639P)

Student write-up

PS-II project title: Web portal development and other tasks (resolving issues)

Short summary of work done during PS-II: It's been a great experience interning at Amazon so far. I've learned how to use java, javascript, jsp and intellij for web development. I've got a great experience of team work with amazing talented people. I will be now working on the further development of this portal to enhance user experience with more features.

Tool used (Development tools - H/w, S/w): Java, JSP, Amazon DB, Amazon AWS

Objectives of the project: 1. To add an alert notification pop-up when the user enters invalid data into the UI. 2. To reduce the loading time of the portal page. 3. To add the button to the UI which downloads the required tsv files based on certain filters. 4. To verify and improve the same.

Major learning outcomes: Learnt team work, discipline and how to work with tight deadlines. Learnt various tech stacks like Java, Java script, JSP, IntelliJ idea, functional of Mac OS, cloud desktop, dynamo DB.

Details of papers / patents: Nothing

Brief description of working environment, expectations from the company: Working environment was very comfortable and professional.

Academic courses relevant to the project: Object Oriented Programming.

Name: DIVYANSHU SINGH (2017B4A70547P)

Student write-up

PS-II project title: Data warehouse flow migration

Short summary of work done during PS-II: Basically the work involved making code changes related to AWS services. Exact details are confidential.

Tool used (Development tools - H/w, S/w): Java, IntelliJ IDEA, Guice, Mockito, AWS services.

Objectives of the project: Architectural changes to decouple data warehouse flow from database.

Major learning outcomes: Design and implementation of software, soft skills.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work life balance was good (this is totally team dependent). Expectation from an intern were not too much and was easily manageable. PPO chances highly depend on current headcount requirement so don't go by previous stats.

Academic courses relevant to the project: DSA, OOP, DBS.

Name: RIYA BHANDARI (2017B4A80773P)

Student write-up

PS-II project title: GameX-Leaderboard

Short summary of work done during PS-II: I have created multiple APIs for leaderboard named: Create, Get, Update, List and reward leaderboard from end to end. Create leaderboard is used to save entry in DynamoDB table. List Leaderboard is used to list entries from DynamoDB table based on partition key. Get leaderboard is used to get a specific entry from table based on partition key and sort key. Update leaderboard is used to update the entry and lastly Reward leaderboard is used to reward leaderboard winners.

Tool used (Development tools - H/w, S/w): IntelliJ, Coral, Google Guice, Java, DynamoDB.

Objectives of the project: To develop a Leaderboard for games on Funzone.

Major learning outcomes: I learnt how to create APIs with the help of DynamoDB and to test them.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment is pretty flexible in terms of number of hours and as well as timings. Colleagues are very friendly and helps you most of the time when blocked. The company expects you to complete whatever one has committed to.

Academic courses relevant to the project: Object Oriented Programming and Data Structures and Algorithm.

Name: KAUSTUBH DWIVEDI (2017B5A70615P)

Student write-up

PS-II project title: Creation of batch invoice operations API

Short summary of work done during PS-II: My work was in the Data Ingestion team at the Transportation Financial Systems Organization at Amazon. My task was to create APIs in order to trigger validation for thousands of invoices at the same time and provide appropriate output for each of them. The other API was related to trigger variance adjustment for a batch of invoices.

Tool used (Development tools - H/w, S/w): Coral, Spring, IntelliJ.

Objectives of the project: To create APIs in order to trigger validation and variance adjustment for multiple invoices at a time.

Major learning outcomes: How to create APIs, how to write clean JAVA code, how to do documentation.

Details of papers / patents: No papers / patents

Brief description of working environment, expectations from the company: The work environment and the kind of work given at Amazon is team dependent. At the data ingestion team where I was working in, everyone was really supportive and gave enough time to me to get used to the tools used by the team. My team members were always supportive and helped me whenever I approached them for some help.

Academic courses relevant to the project: Data Structure and Algorithms, Object Oriented Programming.

Name: SANAGAPALLI DEVENDRA DHEERAJ GUPTA (2017B5A70670H)

Student write-up

PS-II project title: Feed migration to event based system

Short summary of work done during PS-II: Design and implement new architecture to migrate a data feed from a batch job based system to real time system using notification services like AWS SNS and SQS.

Tool used (Development tools - H/w, S/w): AWS, Java, Scala, TypeScript, Junit, Mockito.

Objectives of the project: Migrate a data feed from batch job based system to real time notification system.

Major learning outcomes: Software architecture, AWS, system design.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: PS was mostly virtual. Company expects you to keep up with the pace and complexity of the projects they deal

with. They expect you to show their "Leadership principles" along with technical skills. Look them up if you don't have an idea of what I'm talking about. Prior development experience is definitely useful, otherwise might face some difficulty. Document everything you do from the beginning as you need to give a "conversion doc" for the final evaluation, if you're looking for a PPO. The doc should explain why you are a good fit for the company and the team.

Academic courses relevant to the project: OOPS, DSA.

Name: SOBAT SINGH (2018A3PS0313P)

Student write-up

PS-II project title: FSR benchmarking tool and automation

Short summary of work done during PS-II: When a user searches for an item on the Amazon page, there is a slight delay in the processing of results, apart from the internet delay. This delay is basically due to the deep learning model employed to give the most relevant results. The FSR infrastructure works on improving the latency and increasing the throughput. We have to test the benchmarks for different types of models and improve them using different platforms. The science team recently delivered matching ranking combine models for inference on the FSR platform. We benchmark the models using different available tools such as performance analyzer, Model Analyzer, and Inferentia. These tools do not provide a great user experience in their usage. We develop a user-friendly CLI tool around Inferentia and model analyzer such that the user can provide command-line arguments and get the benchmark results and plots.

Tool used (Development tools - H/w, S/w): EC2 machine, Nvidia Triton server, Nvidia TensorRT, Model analyzer, Inferentia.

Objectives of the project: Researching new benchmarking tools and integrating it with existing FSR benchmarking tool.

Major learning outcomes: Scala, Nvidia Triton Server, Nvidia TensorRT, Performance Analyzer, Model Analyzer, Documenting, Presentation.

Details of papers / patents: None

Brief description of working environment, expectations from the company: We have joined the Final Stage Ranker (FSR) team as software development interns. This team is a part of the larger, Search Engine Technologies (SET) team. SET designs, implements and operates the backend of the Amazon product search. They provide the most relevant search results at low latencies while constraining costs and absorbing growth in the catalog (documents) and traffic, as well as addressing new requirements from business teams. The team invests in these areas: advancing the query engine; adding support for new forms of learning and ranking; simplifying and streamlining data ingestion, and operational excellence.

Our team works on the final stage ranker algorithm which drastically improves the search speed for any search engine. The team tests the deployment of the FSR model in various regions across the globe and maintains the model for all the regions where it is already in production.

My managers team was fairly new and hence we were part of a pilot project where the mentor was from US. The working environment was great I feel, I had the liberty to work according to my comfort and only expectation was to deliver the results on time.

Academic courses relevant to the project: Object Oriented Programming, Operating System.

Name: ISHITA AGGARWAL (2018A3PS0343P)

Student write-up

PS-II project title: Backporting service development, timber migrations, supplier procurement app development

Short summary of work done during PS-II: As a part of backporting project, implementing code changes in order to allow back porting database changes to legacy system using native AWS services such as AWS Lambda, SQS etc.. in order to provide unhindered customer experience

for customers using legacy system and allow its deprecation simultaneously. As a part of timber migrations, creation of new timber hosts in order to deprecate old hosts and prevent shared timber logging. As a part of supplier procurement app development, development of a new Argo application in order to deprecate existing portal for communication with vendor for production schedules.

Tool used (Development tools - H/w, S/w): NAWS, react native, Java, GraphQL.

Objectives of the project: Reduce operational burden, deprecation of current systems and move to new and improved architecture.

Major learning outcomes: Native AWS services, Ruby on Rails, react Native, GraphQL.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Differs from team to team, but in general work is fast-paced but work environment is flexible and cordial.

Academic courses relevant to the project: DSA, DBMS.

Name: HEENA (2018A7PS0160P)

Student write-up

PS-II project title: Project 1: Gizmo throttling for Sherlock

Project 2: Onboarding SD non-endemic ads/S'more books for moderation

Short summary of work done during PS-II: 1. The project involved extensive reading on various load-shedding and throttling mechanisms. As a part of this project, I analysed past 1 year data for all of service's APIs to derive a threshold limit for various environment and clients. As a next step, I defined rate-limiting policies and integrated the service-side throttling framework with the service.

I got to learn about various discovery mechanisms for finding peers in a network and to synchronize the states among them.

2. The project revolves around the workplace, process, subprocess and queue that are used for moderating an ad. The project was to develop a new workflow for non-endemic ads. As part of this project, I created workflow for all the marketplaces and subprocesses. I got to learn about the moderation process flow after an ad is rejected by ML models.

Tool used (Development tools - H/w, S/w): IntelliJ, Java, Amazon Internal Dev tools, Git.

Objectives of the project: 1. The project was to enforce a throttling mechanism to prevent users from making inconsistently high requests and prevent the service from experiencing latency spikes and unavailability. 2. Amazon has decided to host non-endemic ads on its website. Non-

Major learning outcomes: Object Oriented Programming, System Design, Design Patterns, Working in Teams, Communicating effectively.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The features developed by me had direct customer impact. Despite being an intern, I was given the same amount of responsibility as a full time developer on the team. My team and manager helped me come up with effective ways to manage my tasks.

Academic courses relevant to the project: OOP, DSA.

Name: KUMAR PRANJAL (2018A7PS0163H)

Student write-up

PS-II project title: Cross border fulfilment

Short summary of work done during PS-II: I worked on multiple small tasks, all aimed at improving the system. I worked with the team on both frontend and backend tasks to get to know the complete architecture of the system. I worked on fixing UI issues, upgrading the UI library, fixing integration tests for the deployment pipeline and migrating data storage from away-team systems to our systems.

Tool used (Development tools - H/w, S/w): IntelliJ, VS Code, Java, TypeScript, React.

Objectives of the project: To improve the system used by an already built portal by which sellers can export their goods to different countries using Amazon.

Major learning outcomes: Presentation and communication skills, web development, teamwork, and time management.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The team I was working on was amiable. They helped me in every step of my project. I had the flexibility to work anytime I wanted. I just had to attend daily standups at a scheduled time. I regularly interacted with the manager and mentor to discuss progress and blockers, if any. Overall, I enjoyed working with my team.

Academic courses relevant to the project: Object-Oriented Programming and Software Engineering.

Name: MANAV P MEHTA (2018A7PS0164G)

Student write-up

PS-II project title: Interview solicitation tool

Short summary of work done during PS-II: We tried building a portal where all employees can submit their availability for interviews and the recruiters submitted the list of candidates for whom the interviews need to be arranged. We had to write a scheduling algorithm and build a full stack application from scratch.

Tool used (Development tools - H/w, S/w): Frontend: React + Typescript, Backend: Java, Coral, Dagger, Jooq.

Objectives of the project: Create an interviewer portal from scratch, where all employees can submit their daily availabilities. Also write scheduling algorithm which will match candidate demand to availability.

Major learning outcomes: Using AWS and all its functions. Uploading a File to S3, ReactJS frontend design of a new website, JAVA OOPs, Jooq for creating Data Access Object Layer.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work environment was on the hectic side since our project had hard deadlines to fulfil and we needed to keep up with the deadlines and had to meet with recruiters every week. On average, we worked around 8 h / day and at times had to work on weekends as well.

Academic courses relevant to the project: OOP, DSA, DBMS, CP.

Name: PARIKH KAIVAL NISHITH (2018A7PS0176P)

Student write-up

PS-II project title: Search backend optimization

Short summary of work done during PS-II: My project revolved around enhancing quality and number of results on marketplaces, by incorporating information about dynamic fields like

availability, one-day-delivery, etc during closest product retrieval itself. This product retrieval involves semantic search and can be costly, especially when some products are dropped at later stages of checking for these filters. After enabling this functionality, we can give the next most relevant results to users, and also predict the result set better.

Tool used (Development tools - H/w, S/w): Java, Python scripting, IntelliJ (Editor, Debugging, Profiling), Git, GitHub, Jira.

Objectives of the project: Enhancing the quality and number of results on Amazon marketplaces by enabling pre-filtering on dynamic fields.

Major learning outcomes: Learnt about search algorithm optimization, open-source contribution, insights into production systems, development workflow and corporate work environment.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Amazon provided a holistic work environment, with a team spread across India, Europe and USA. My mentor and manager were really supportive, and helped me with technical challenges along with overall growth. The project was well defined, and gave me exposure to production systems as well as open-source contribution.

Academic courses relevant to the project: Data Structures and Algorithms, Object Oriented Programming.

Name: SIDDHARTH SHARMA (2018A7PS0199G)

Student write-up

PS-II project title: Addition of certain features across different services

Short summary of work done during PS-II: I was a part of AFT Receive Team which owns the tools and services related to receiving of pallets, containers and other items in Amazon Fulfillment Centers. The tasks were largely related to feature addition to the web portal, integration of a new workflow in our services, and enhancement of security features for our services.

Tool used (Development tools - H/w, S/w): Java, JavaScript, AWS.

Objectives of the project: Addition of certain features across different Services.

Major learning outcomes: OOPS, Problem Solving, Communicating effectively with teams, managers and skip managers.

Details of papers / patents: Not Applicable

Brief description of working environment, expectations from the company: At Amazon, the team is going to be extremely helpful and are ready to help whenever in trouble. The tasks assigned to me were extremely diverse and interesting. In my team, the interns were assigned tasks of SDE-1 level, which proved to be a great learning experience. Also there will be some cases where the interns will be expected to completely own the projects and tasks. I will advise the interns to give their updates on work on the regular basis, so that the appropriate help can be provided by the team, if needed.

Academic courses relevant to the project: Object Oriented Programming.

Name: AGRAWAL TANISH RAJESHKUMAR (2018A7PS0202G)

Student write-up

PS-II project title: Accessibility and receive core service enhancements

Short summary of work done during PS-II: I was able to implement all the changes that would make our website accessible. The changes were made and then communicated with associates

with disabilities to ensure that they were up to the mark. The changes made for the project have been merged into the main codebase and have been sent for beta testing to ensure that they are working properly before deploying them worldwide. Once these features have been deployed worldwide, they would definitely open up more opportunities for disabled people to work as part of the receive process at the Amazon fulfillment centers. The changes also help us to make sure that we are providing the best customer experience to our customers.

Tool used (Development tools - H/w, S/w): AWS, Git, Java, Spring framework, HTML, CSS, JavaScript, JSP, XML.

Objectives of the project: My goal was to make the primary website of my team accessible.

Major learning outcomes: I learnt about the vision and the leadership principles of Amazon. I have been introduced to various services within the software domain and the uses for each of them. I have also learnt about a lot of new tools and technologies like API, AWS, Git. While I was working on the back-end development, I learnt about Java, Spring framework and debugger. Then I started with the front-end development and learnt about various languages and frameworks like HTML, CSS, JavaScript, JSP, XML. There has also been a significant improvement in my soft skills. I also got the chance to connect with many different people in my organisation.

Details of papers / patents: Not applicable

Brief description of working environment, expectations from the company: The working environment at Amazon was pretty great. Everyone was supportive throughout the internship and you could ask anyone for help. The work life balance is also great in my team. There were also happy hours every week to ensure that everyone stayed connected while working virtually.

Academic courses relevant to the project: OOP, DSA.

Name: AARJAV JAIN (2018A7PS0222P)

Student write-up

PS-II project title: Reconciliation system

Short summary of work done during PS-II: Provides visibility into the services, to the developers and clients Raises a ticket as soon as there is an error in the backend provides information in the tickets to help debug the error Limits the risk to the organization by enabling a credit limit for every shipper.

Tool used (Development tools - H/w, S/w): Amazon's internal tools, AWS CDK, Google Guice, Springboot and ReactJS.

Objectives of the project: Reconciliation System is an optimized service performance measurement tool used to verify the completion of the workflow. This report talks about the overview, the problems and their solutions, and the design features of the project.

Major learning outcomes: Set up a project on AWS CDK which automatically generated resources in the AWS stack and automated their execution. Enabled a feature for Indian clients, where a credit limit can be enforced on the business they do with the organization to limit risk. Learnt and worked on Amazon's internal tools, AWS CDK, Google Guice, Springboot and ReactJS.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: I expected to learn new tech stacks and gain experience in the corporate world. I learned a lot about large scale decision making. I worked on challenging tasks which had direct customer impact. I also had great support from my team to settle into Amazon culture.

Academic courses relevant to the project: OOP, DBMS.

Name: HARSH SHARMA (2018A7PS0230P)

Student write-up

PS-II project title: Improving the catalog operations tooling

Short summary of work done during PS-II: I worked on two projects. The first involved adding support for newer attributes to Amazon Music's catalog tooling system and supporting audits as well. The second project involved using configurations for onboarding new attributes to the tooling system.

Tool used (Development tools - H/w, S/w): IntelliJ IDEA, DynamoDB, SNS, SQS, G2S2, Coral, Horizonte, Mockito, Junit.

Objectives of the project: To improve the catalog tooling system of Amazon music by adding support for more attributes, adding support for audits and implementing onboarding of new attributes via configuration files.

Major learning outcomes: Software Development best practices, backend development, AWS, Coral, Horizonte, CI/CD, Unit testing and integration testing.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Agile is used for planning projects. Deadlines are not very flexible, so potential delays need to be accounted for while planning the project. The company provides a lot of autonomy, and you get to take ownership of the software development cycle. The work environment is friendly and you can reach out to anyone if you need help.

Academic courses relevant to the project: OOP, DSA, Computer networks.

Name: HRITWIK GOKLANEY (2018A7PS0238P)

Student write-up

PS-II project title: Implementation to handle authentication errors and migration

Short summary of work done during PS-II: 1. Data analysis and implementation to handle authentication error statuses received from 3DS partners. 2. Handle library migration for APIs to fetch and update DynamoDB table for charge validation specific use-case. 3. Implement delete API to support removal of payment method from amazon side.

Tool used (Development tools - H/w, S/w): AWS Lambda, SQS, Kibana, QuickSight, JAVA.

Objectives of the project: Work on various tasks to improve existing payment services MFA architecture. (Data Analysis, Design and Implementation).

Major learning outcomes: Learnt about data analysis and visualization using QuickSight and Kibana, using Google Guice for dependency injection, GraphQL APIs, AWS lambda, SQS and object oriented programming.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The internship was work from home. Work culture and environment is really good and interns are treated as full time employees. Manager, mentors and team help you out in case you are stuck/blocked on something. You are expected to take complete ownership of your project and lots of opportunity to grow your skills through various sessions organized by Amazon.

Academic courses relevant to the project: Object Oriented Programming, Data Structures and Algorithms, Computer Networks.

Name: SHREYAS SAMIR KOLTE (2018A7PS0376P)

Student write-up

PS-II project title: Bulk lot-Vviewer tool for business-end entities of Amazon

Short summary of work done during PS-II: My project was to build a new tool at Amazon for sellers, specifically so that they can view data such as MRP, Expiry Date, available units, etc. for all their products on Amazon. The first few weeks were spent in learning the Java Spring Framework, brushing up on HTML/CSS and JS and learning Java Server Pages. Also completed some mandatory trainings on Amazon/AWS services such as EC2, S3 Buckets, DynamoDB and Lambdas. Following this received the Business Requirement Document for the project, with review for Client-side view. Started project development by creating a design wiki (document containing all information about the project) with High-level and Low-level design. After this had a review of the design, made effort estimates for all components of the design and started development. Basically the project involved making an Excel Processing Lambda which extracts seller details from Excel sheet received as input and feeds them to a FIFO AWS SQS queue. These data are then processed at the backend and a table is returned for each element in the SQS queue. The tables are then returned to the frontend. This was the first part of the project. The second part was to develop a pagination mechanism for showing these tables along with a cache (made from DynamoDB) to store already visited pages at the controller (Sorting functionality was also implemented, with objects stored in cache having a key for sorting column order as well). Final part was to make some components of UI configurable such that no code change would be needed to change them. This was done using an internal tool of Amazon called G2S2.

Tool used (Development tools - H/w, S/w): S/w: Java Spring Framework, Amazon DynamoDB, AWS Lambda, AWS SQS, AWS S3 buckets, AWS EC2, Java Server Pages, HTML/CSS.

Objectives of the project: Building a bulk version of the existing Lot-viewer tool for Amazon sellers to view their product data in Amazon stock keeping units.

Major learning outcomes: Java Spring Framework, Amazon DynamoDB, AWS Lambda, AWS SQS, S3 buckets, EC2, Java Server Pages, MVC Design Pattern.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Unlike what I had heard from seniors and previous employees, the work culture was superb and my team was very understanding. All members, including the manager were ever ready to solve any and all

queries and removing all blockers in the work. Never felt high work load and received lot of support and learnings not only on technical side but also on how teams operate and what processes exist for every task carried out within Amazon.

Academic courses relevant to the project: OOP, DSA.

Name: HARSHIT AGRAWAL (2018A8PS0484P)

Student write-up

PS-II project title: Final stage ranker benchmarking and automation

Short summary of work done during PS-II: I started with understanding my team's benchmarking tool for benchmarking trained deep learning models on Triton Inference Server. I benchmarked 12 different production models, analyzed the results and documented them. I also explored Nvidia TensorRT and used it to improve the benchmarks of the models. I also worked on a new technology, AWS Inferentia for optimized deep learning inferencing. I developed a user friendly CLI tool in Python to enable user to pass their model and parameters as command line arguments and obtain the results. Finally, I enhanced the current benchmarking tool by adding a recommender feature in Scala for model tuning.

Tool used (Development tools - H/w, S/w): H/w: Triton, Perf analyzer, Model analyzer, Inferentia, NeuronPerf, AWS S3, EC2, ECS, Docker.

S/W: Scala, Python.

Objectives of the project: 1. Benchmark different FSR models using Perf analyzer benchmarking tool. 2. Evaluate the models and benchmark using Pytorch, ONNX, TensorRT formats. Develop CLI tools for NeuronPerf (Inferentia) and model analyzer. 4. Add automation recommender feature in the model.

Major learning outcomes: During this PS2 internship, I learnt using tools such as Triton, Performance Analyzer, Docker for benchmarking trained deep learning models. Amazon focus a

lot on writing standards and this helped me enhance my writing skills (Writing documentation effectively is critical for smooth functioning of team). I learnt best coding practices in Scala and Python, writing production level code and unit testing the most important fragments. My researching skills also improved as a lot of my work involved exploring different tools and technologies for the first time in my team. Another learning outcome was Amazon's leadership principles which are automatically inculcated into us working with them.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment was overall chill and balanced. My manager and team were new but we worked quite efficiently. Amazon is a customer centric company and focuses a lot on its leadership principles and inculcates them into us.

Academic courses relevant to the project: Neural Networks and Fuzzy Logic, Computer Programming.

Name: KETAN GOYAL (2018A8PS0900H)

Student write-up

PS-II project title: Out of band subscription using ideal for living room devices

Short summary of work done during PS-II: Partially completed Integration testing. • Made email templates that needs to be sent to the customers. • Made changes in the code base following the design doc and the approaches discussed. • Project design document was updated and approved. • Arranged sync ups with US teams and discussed the approaches. • Attended team scrum meetings and events.

Tool used (Development tools - H/w, S/w): Spring – Java.

Objectives of the project: iDEAL is an online payment method offered by Dutch banks as part of their online banking service and enables e-commerce customers to pay online through their own bank. During the checkout process, the customer is automatically redirected to the customer's portal.

Major learning outcomes: Got to learn plenty of new tech stacks such as,
Made changes in the main team services and play around with the workflow.
Learnt how to write Integration tests.
Learnt how to work in a team and make code changes based on certain approach.
Learnt how Design docs are made and various steps to be taken to create one.
Performed a routine task and got a better grasp of things.
Got to learn a lot about team specific services and related tech stacks.
Onboarding tasks gave a very good exposure of the company's culture and expectations.

Details of papers / patents: Made several commits and deplyments.

Brief description of working environment, expectations from the company: Many teams at Amazon are flexible and provide supportive work environments with ample opportunities for career development and growth.

Academic courses relevant to the project: OOPS, OS, DSA.

Name: V ABHIJEET (2018A8PS1032H)

Student write-up

PS-II project title: Amazon Go: Automating Regression Testing of Network Device Configurations and Automated Alarm Suppression for WAN Maintenance

Short summary of work done during PS-II: Worked on developing Python scripts for regression testing.

Tool used (Development tools - H/w, S/w): Python, IntelliJ PyCharm.

Objectives of the project: Automating regression testing of network device configurations and automated alarm suppression for WAN maintenance.

Major learning outcomes: Python development, regression testing, automation.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Good working environment, company expects you to finish the assigned work on time. However, guidance is also excellent.

Academic courses relevant to the project: OOP.

Name: SHRUTI RATHORE (2020H1030066G)

Student write-up

PS-II project title: Offshore Marketplace Returns- Return Resolutions Non-Eligibility Reasons

Short summary of work done during PS-II: Learnt lot of new technologies like react, Spring, Springboot. Built a solution that could help both the Amazon client and Amazon employees. Organized several events. Dived deeper into things. Learnt leadership skills.

Tool used (Development tools - H/w, S/w): Python, IntelliJ PyCharm.

Objectives of the project: 1. Prioritize consistency over specificity, by having a uniform design for all offshore marketplaces rather than one specific marketplace (internal or external).
2. Prioritize use over reuse, by limiting the changes that must be made within CReturns native.

Major learning outcomes: Learnt new technologies. Got to know how to relate the knowledge acquired from Masters in real life. Explored leadership skills.

Details of papers / patents: NIL

Brief description of working environment, expectations from the company: Great working and learning environment. Amazon provides a huge learning curve for interns. It provided me a scope of doing and accomplishing and taking the ownership of the whole project. Great colleagues, very helpful. Overall a very good environment.

Academic courses relevant to the project: Adv Algorithms, Cloud Computing.

PS-II Station: Amazon Development Center, Chennai

Faculty

Name: T Venkateswara Rao

Student

Name: KSHITIZ KHOSLA (2017B2A81039P)

Student write-up

PS-II project title: Integrating a new TV Input Service in FireTV

Short summary of work done during PS-II: Worked on 2 major projects: 1) Work with external vendor's engineering team to integrate them as a new TV input service in FireTV to achieve Live playback, EPG, PVR recording and channel scan functionality. Test the APKs and debug for the issues observed. 2) Built an Android application to connect the Android device to the FireTV

remote through Bluetooth, and receive the KeyEvents from the FireTV remote. Validate if the remote is functioning properly by doing Monkey testing. Other than these worked on small tasks like making small code changes, fixing bugs, etc.

Tool used (Development tools - H/w, S/w): Java, Kotlin, Android.

Objectives of the project: Integrating a new TV Input Service in FireTV to achieve Live playback, EPG, PVR recording and channel scan functionality.

Major learning outcomes: Java, Kotlin, Android.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Work from Home - No Log in / Log out timings. I was in the FireTV devices organisation. My team majorly worked on Amazon FireTV (JP edition). Manager / mentor were pretty chill and understanding. The entire team was approachable and helpful. Deadlines were somewhat tight which led to long working hours.

Academic courses relevant to the project: OOP, DSA.

Name: BADJATE AMAN SANJAY (2017B3A70559H)

Student write-up

PS-II project title: 1) Enhancing Fire TV search experience on partner EPG app 2) Adding DishTV as a provider in set top box onboarding

Short summary of work done during PS-II: 1) To provide search ingress into partner OTA EPG app from “Search in apps” row in search results UI. Clicking on EPG app icon from “Search in apps” row will take the customer directly into search results page within the EPG app, as described below. This experience would be similar to how Youtube search is integrated. 2) User

can use alexa to tune to a channel by saying "Tune to <channel name>" or "Tune to <channel number>". User can start the onboarding process by going to Settings → Equipment Control → DTH Set Top Box. User then has to go through a STB onboarding/setup flow where the user selects their provider. After selecting their provider, we ask for input slot in which STB is plugged in and then we do IR profiling of STB provider. Add DISH TV as a provider here.

Tool used (Development tools - H/w, S/w): Android Studio, Postman, OOP, Multi threading.

Objectives of the project: 1) To add 3P app in search in apps row when a user searches anything on FireTV 2) Add DISH TV as STB provider.

Major learning outcomes: Android development, Production cycles, Unit testing, Multi threading.

Details of papers / patents: No papers / patents for my projects.

Brief description of working environment, expectations from the company: For my team, work environment was very chill. All the team members were very helpful. My manager was very supportive and would understand if I faced any problems.

Academic courses relevant to the project: OOP, DBMS, DSA.

Name: ABHISHEK PRATIK (2017B4A30864P)

Student write-up

PS-II project title: Critical Bug Fixes for ValU Public Launch

Short summary of work done during PS-II: Worked on 7 bugs, fixed 6 of them. My team catered to the Middle East and Africa Region. We launched Buy Now Pay Later for the 1st time in Egypt in 2022.

Tool used (Development tools - H/w, S/w): Amazon internal tools.

Objectives of the project: To solve critical bugs that were blocker for the launch.

Major learning outcomes: Working in a big IT firm, coding of the highest standards, documentation of the highest standards.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good work environment, company expects utmost dedication and seriousness.

Academic courses relevant to the project: OOP.

Name: SHIVAM KANKAL (2018A3PS0174H)

Student write-up

PS-II project title: Monthly Warranties Signup Asgard Migration

Short summary of work done during PS-II: Digital Purchase Workflows (DPW) is a pluggable container for Digital Ordering business logic. It is a common-platform for all the type of content acquisitions (sample/buy/borrow/rent/purchase/subscribe) and returns/refund/redemptions. It gathers all the data required for placing, ordering request with relevant systems. Today each Digital category (Kindle, MP3, etc.) and to a lesser extent each surface (Retail Web, EInk, Tablet etc) has separate end-to-end implementations of content purchase workflow, with each category having at least one business logic layer in different platforms (Kindle in KIS; MP3 and Audible in Coral). While all of them use same platform for order-placement, they each maintain separate business rules (pricing, payments, offer selection, device eligibility etc) and UI pages to control the eligibility of purchase. Currently the digital purchasing logic is being hosted by dpw and it has a good number of onboarded clients. But since dpw has some issues like tightly coupled architecture, latency, throughput, and difficult to debug. To overcome those issues, asgard is introduced which is a modified version of dpw and has good latency, throughput and pretty straight forward approach for the clients. So, this project is to migrate the clients from dpw to asgard and

prove the correctness of asgard to the clients by performing shadow testing. This solution simplifies the usage of DPW for our clients. This solution makes easy for the developer to debug. This solution will decrease the implementation time. This solution makes the execution as abstract as possible for the developers.

Tool used (Development tools - H/w, S/w): JAVA, Spring framework, Kotlin.

Objectives of the project: Migrate warranties team sign-up services from DPW to Asgard.

Major learning outcomes: I enhanced my software skills during the Internship. In addition to that i got to learn about the leadership principles of Amazon.

Details of papers / patents: No paper published.

Brief description of working environment, expectations from the company: Amazon has a great working culture. Every person in the firm is brilliant and highly intellectual and one can easily learn a lot from them. The culture allows us to explore and learn new things throughout the internship. It enables us to deep-dive into the issues and to learn from them. The company has some leadership principles and they expect us to own those principles and apply them in our daily working. Applying these principles increases our efficiency and helps us achieve our goals. It also helps us to understand the client expectations in a better way.

Academic courses relevant to the project: OOPS, Computer Programming.

Name: AYUSH SHARMA (2018A3PS0326P)

Student write-up

PS-II project title: Integrated Device Management System and Tickets Trends Service

Short summary of work done during PS-II: Developed a REST APIs in backend using Jersey and an internal framework of Amazon. Created Stepfunction in AWS to send automated emails

and schedule it using Eventbridge. Frontend development was done using React and Typescript, and the changes were deployed in AWS by creating Hosted Zones for our endpoints. Created AWS infrastructure using AWS CDK for all the services that I worked on.

Tool used (Development tools - H/w, S/w): Macbook, Developer desktop (EC2), Docker, Java, REST APIs, React, Typescript, SQL, Aurora DB, AWS (S3, ECS, Lambda, API Gateway, IAM).

Objectives of the project: Full stack development of features in the tools being developed by the team.

Major learning outcomes: Backend development using Java, Frontend development using React Typescript and deploying using AWS.

Details of papers / patents: Not applicable

Brief description of working environment, expectations from the company: My team had great work environment for interns, but I could see my mentors and other teammates working hard. When the team was in WFH setup, people can ping at any time even after dinner, but you can ignore it if you're not logged in as people have different working hours. In office, I used to reach at 10 AM and work till 6 pm most of the days.

Academic courses relevant to the project: OOP, DBMS and DSA.

Name: ABHINAV SHANKAR (2018A7PS0105G)

Student write-up

PS-II project title: Web application for handling multimedia files

Short summary of work done during PS-II: My tasks were mainly adding features to the existing application. I was involved in enhancing the user interface of the application and improving the user experience. I made the application more efficient in connecting to internal services for user

authentication. While working on the project, I learnt about new technologies and was able to apply these skills in completing tasks that enhanced the product. My first task was to change the mechanism in which credentials were delivered to the application. My second task was to create a new page in the web application that gave more information about the metadata of the multimedia files. My third task was to modify the file name while downloading to give more information about its metadata to its user. Finally, my last task was to move the existing application to a new architecture. I learnt about AWS services and web development methodologies.

Tool used (Development tools - H/w, S/w): React, Flask, MySQL, AWS services, Python, Android Framework, Java.

Objectives of the project: The project deals with creating a useful tool for storing multimedia files and offering various functionalities to search and download these multimedia files.

Major learning outcomes: Web development, React, Flask, AWS services.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: I had a great experience throughout my internship. I had engaging discussions with my mentor and team mates during regular meetings. My manager was very helpful in providing me advice to navigate Amazon's vast internal resource system. The work environment was nice and I got to interact with several members of my team. Intern channels were created by the Amazon HR team that really helped me interact with other interns.

Academic courses relevant to the project: Yes, I found several courses that I had taken at BITS useful in giving me a base to further expand my knowledge upon. OOP, Computer Networks, SDPD were some of the most helpful courses in my internship.

Name: DEVANSHU (2018A7PS0194P)

Student write-up

PS-II project title: Migration of application from one platform to another

Short summary of work done during PS-II: Worked on 2 projects, 1st project was getting the list of users, send them an email and write unit test cases for this work. 2nd project is migration of some application from Platform 1 to Platform 2 as there were many drawbacks in existing platform.

Tool used (Development tools - H/w, S/w): GitHub, VS Code editor, IntelliJ, Slack, Asana, Postman, Docs and many internal tools.

Objectives of the project: The goal of the project is to migrate some application from Platform 1 to Platform 2 as there were many drawbacks in existing platform.

Major learning outcomes: Got to learn front-end technologies like React, Angular and also worked in Java, AWS and CDK.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Flexible working hours, no fixed timings. Work was generally on a higher side. Got to work on full stack development (React and Java).

Academic courses relevant to the project: OOP and DSA.

Name: SIDDHARTH KAPOOR (2018A7PS0232P)

Student write-up

PS-II project title: 1) Improving Stylus user experience using touch prediction
2) End to end solution for downloading language packs

Short summary of work done during PS-II: 1) Experimented with the touch prediction algorithms being developed at Amazon for their fire tablets and implemented new features to improve the predictions and reduce error. 2) Designing and implementing the Android client and AWS backend for a service to download updated language packs on to fire OS device.

Tool used (Development tools - H/w, S/w): Android studio, AWS, Git.

Objectives of the project: 1) Come up with ways to improve the touch prediction algorithms under development at Amazon 2) Design and implement a client and the backend for downloading language packs onto a device.

Major learning outcomes: Learnt about Android development, AWS development, Software Engineering in industry, git version control, HCI and UX research.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The team was good. The manager and mentor were very understanding and supportive. They helped me out and provided resources and direction whenever I required it. The work given to me was also really interesting and not some small jobs. The work life balance was also pretty good, and working over weekends or at night was never required.

Academic courses relevant to the project: OOP, DSA, Networks, OS, DBS.

Name: KOUNDINYA KUPPA (2018A7PS0283P)

Student write-up

PS-II project title: Tablet Maps app routing migration

Short summary of work done during PS-II: As a part of this project, I was expected to develop a package to facilitate the changes occurred due to update by a third party company. So, I have

used various annotations to develop input and output model classes, libraries like moshi to work on networking. I also learnt about various testing methods to test the developed packages.

Tool used (Development tools - H/w, S/w): Android studio, Amazon internal tools, Tablet device to test the changes.

Objectives of the project: To develop a package in Java to accomodate changes in Maps routing

Major learning outcomes: Quality of code writing improved, learnt about various tools used to build APIs, testing methods.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is good. Since the mode of work is WFH, I had flexible hours to work. The employees in my team are friendly and are always ready to help when I had doubts. The expectations from the company are reachable and there are no hard deadlines given to me by my team.

Academic courses relevant to the project: Data Structures and Algorithms, Object Oriented Programming.

Name: DHRUV ADLAKHA . (2018A7PS0303H)

Student write-up

PS-II project title: Automating weekly tasks using Quicksight and code and code review based Quicksight changes and batches reload extension

Short summary of work done during PS-II: First project - My team did some manual processes every week to generate data which concerns the metrics of services. It took 3 hours every week to make the powerpoint presentation. With my work the time taken for making that has reduced to self service saving a lot of dev efforts. Amazon Quicksight was used with an internal tool. Now

the users get a place where they can access the metrics directly and do not have to perform long time consuming tasks. Second project - Amazon Quicksight does not have any link with Amazon's code review based process. My task was to build a process of linking both which would be simple for the user and saves replication time. Reload of batches needs to be triggered from the Quicksight dashboards so I worked on that later. After these projects were completed I was assigned tickets which are related to feature requests or improvements in the team's systems. These tickets ranged from writing jobs to adding code to existing packages.

Tool used (Development tools - H/w, S/w): Amazon Quicksight, SQS-SNS, IntelliJ, AWS.

Objectives of the project: Optimizing existing process for the team and analyzing approaches & implementing for new usecases.

Major learning outcomes: Software development, AWS, Java, SQL, Code quality improvements.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: My team at Amazon was very helpful throughout the intern. The whole team was very experienced with the services the team offers. The work time is flexible, only for the daily meetings you need to be present on time rest when you work is up to you. The work was planned in the sprint meeting biweekly and then a standup daily to track the progress. Everything is very organized at Amazon from the starting onboarding process to the exit review process. Things are documented very well which saves lot of time for the developers.

Academic courses relevant to the project Software engineering, Database systems, Object oriented programming, Data structures and algorithms.

Name: VANSHAJ AGGARWAL (2018A7PS0309H)

Student write-up

PS-II project title: Barcode scanner in MShop application for bill-payments, addition of pricing plan fields to the transaction model and Cloud-Auth onboarding

Short summary of work done during PS-II: 1. A proof of concept for MASH Barcode Scanner done and android version for it is being deprecated. 2. Added the required pricing plan fields and it is being correctly reflected in the incoming orders in prod. 3. Completed the cloud auth onboarding for a new reminders service.

Tool used (Development tools - H/w, S/w): Android Studio, Xcode, IntelliJ, Java, Javascript, Kotlin and Perl.

Objectives of the project: POC for MASH 1.5 API's Barcode scanner and backend tasks.

Major learning outcomes: In-depth knowledge of new packages, Communicating with multiple teams in different time-zones, New coding practices especially writing unit tests.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Working environment at Amazon is very much team dependent. For my team, there was very little time for onboarding and was given tasks very early. The team was very collaborative but the deadlines were a little tight sometimes. My mentor was very helpful and my immediate manager was very considerate as well. The office hours were very flexible and taking leave for genuine was given without much hassle. But sometimes I had to work in multiple time zones to contact away teams. My senior manager was a little strict on deadlines sometimes. Overall environment is very rewarding and a great learning experience.

Academic courses relevant to the project: Data Structures and Algorithms, Database Management.

Name: RAGHAV RAMAN GARG (2018A7PS0312P)

Student write-up

PS-II project title: Unified search

Short summary of work done during PS-II: Mainly worked on the client side of unified search system application for Amazon fire tablet devices. Solved bugs and crashes that occurred frequently in production and implemented some new features as well. Revamped the logging system for the app to get more analytical data.

Tool used (Development tools - H/w, S/w): Java, Kotlin, Git, Android studio.

Objectives of the project: Develop the Unified Search Android application which uses internal and external services to display structured results to Amazon Fire Tablet users. Implement a new feature of pre-loading Search Results to reduce the User Perceived Latency by up to 60%.

Major learning outcomes: Android development, Java, Kotlin, Git.

Details of papers / patents: Not applicable

Brief description of working environment, expectations from the company: The development team had 4 members with 3 quality assurance engineers and an SDM. The work was defined well and every task/issue is tracked in a JIRA using Confluence tool. There were daily stand ups to discuss progress and address doubts. Mentor and buddy were very helpful in solving day to day problems. Manager was very understanding and assigned increasingly complex tasks to ensure learning as well as impact as an intern. Overall, I liked the work and found it challenging.

Academic courses relevant to the project: Object oriented programming, Computer programming, Computer networks.

Name: ABHIJITH S RAO (2018A8PS0651H)

Student write-up

PS-II project title: Full stack development for Amazon academy

Short summary of work done during PS-II: I was part of the Amazon academy team. I did 3 projects during my internship. First one was relating to migrating the backend trigger for notifications in Amazon academy from an experimental setup to a more permanent setup using AWS services. Second one was a POC investigating possibility of Automate Front End React Code generation from Figma components using AWS amplify service. Final project consisted of improving the error handling system for playlist upload in Amazon academy.

Tool used (Development tools - H/w, S/w): Mostly internal Amazon tools for package management, deployment and dependency management; multiple AWS services.

Objectives of the project: Developing, testing and deploying software.

Major learning outcomes: First major exposure to industry-standard software development. So the entire tenure consisted of a learning curve.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was pretty good in my team. My teammates and mentor were really helpful. But before reaching out to teammates for help, make sure you do adequate research on your own. Working hours are flexible, you just have to be available for all meetings. Coming to expectations, in the first month, you are expected to quickly ramp-up to the internal tools and services used by your team. After that, you are expected to deliver results, in an incremental basis wrt to the project assigned to you. Workload is mostly team-specific, for me it was manageable. Had to put in late nights when issues came up or when a release is taken into production. But otherwise, it is manageable.

Academic courses relevant to the project: DSA, OOPS, OS, DBMS.

Name: DHANUSH BALAJI R D (2018A8PS1034P)

Student write-up

PS-II project title: Just-in-Time OOBE

Short summary of work done during PS-II: I was a part of the FireTv welcome experience team. My team mainly focused on the OOBE(Out-of-the-Box-Experience) for customers using FireTv devices. I was asked to develop a POC in which I had to add a 'remind later' option for features in the OOBE process, and then devise methods to deliver reminders for these features to the customers. Designed an interface in which partner feature client teams could trigger notifications on their own.

Tool used (Development tools - H/w, S/w): Java, Android studio, ADB shell commands.

Objectives of the project: Worked on designing a notification based reminder system for customers to get reminders of features that they see during the FireTV device setup.

Major learning outcomes: Android development, Software design principles, Documentation.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The work environment is very dynamic and fast paced. You will be expected to take complete ownership of your project and be responsible for everything right from analysis, design, implementation and co-ordinating with all stake-holders to deliver results as per the deadline.

Academic courses relevant to the project: OOP, DSA, DBMS.

Name: SHREYASH GUPTA (2018AAPS0444H)

Student write-up

PS-II project title: Application development for FireTV and tablet

Short summary of work done during PS-II: Amazon Appstore Monetization team specializes in providing a monetization framework for apps and enable AppStore for app developers. An enhancement feature related to In-App Purchasing (IAP) apps needs to be added as the same could be supported only in Eclipse IDE but not in Android studio. Furthermore, for the new feature launch in the developer portal, DynamoDB database integration was required to enable new options for customers.

Tool used (Development tools - H/w, S/w): IntelliJ Idea, Android Studio, DynamoDB

Objectives of the project: * Launching of new feature in developer portal.

*Migration of services.

*Making IAP apps compatible for Android studio.

Major learning outcomes: Enhancement in technical and soft skills, work-life balance, learnt new tech stacks.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Fast-paced work environment, contributing to the team as and when required, asking seniors for guidance without hesitation.

Academic courses relevant to the project: OOPS, DBMS, DSA.

PS-II Station: Amazon Development Center, Hyderabad

Faculty

Name: Vijayalakshmi Anand

Student

Name: SAHIL KATTNA (2018A7PS0154P)

Student write-up

PS-II project title: Favorite enhancements in Amazon pay

Short summary of work done during PS-II: I was part of the IN-Payments P2P (Peer to Peer) team in Amazon Pay. At first an SDE bootcamp was to be attended to get familiarized with the tools used by the team. After that, I was allotted a simple metrics addition task to get familiar with the codebase flow of the team. Then, I was allotted a Favorite Enhancements project in which I have to work upon three tasks. These were adding search functionality for favorites, to make enter amount page faster, and adding delete favorite functionality. Backend work was mainly in Java and frontend was in react-native. Then in last week, I did the deployment for two packages successfully.

Tool used (Development tools - H/w, S/w): React-Native, Java, SpringBoot, Typescript, DynamoDB, IntelliJ, VS Code, AWS CloudWatch, JUnit, Mockito, Jest.

Objectives of the project: To add/modify favorite service features in Amazon pay.

Major learning outcomes:

1. Understanding the end-to-end process and workflow of APIs.
2. Learnt to write production-level code, design principles and practices from senior SDEs via code reviews.
3. Learnt about design process and writing technical design documents for projects.
4. Hands-on experience working with production systems and pipelines. Learnt about the entire development process from ideation to production.
5. Various testing frameworks like Mockito, Jest, JUnit.

6. Front end development using React-Native.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: My internship was work from home. There are lots of different teams at Amazon therefore the work culture differs from team to team. In my case, it was very good. Teammates are very supportive and they will help you with your tasks. The expectation from an intern is the same as the SDE, which in a way is good, like I got to work on a live project and my project was a significant one. There are daily standups organized to update the team about the work done on the previous day. While developing projects at Amazon, there are various challenges as there are multiple internal tools present. So, while working on any project, one faces a lot of errors (like I got stuck in the testing part for a long time for one of my tasks) and knowledge gaps and this requires some effort to understand. Apart from this, the culture is pretty friendly, one can always communicate with their manager regarding any problem. Amazon also stresses on documentation and you are expected to maintain SIMS/Docs for almost everything you do. Apart from this, there are fun Fridays and social meets organized for fun activities.

Academic courses relevant to the project: Data Structures & Algorithms, Database Systems, Object Oriented Programming.

Name: SRINATH SWAMINATHAN (2018A7PS0204P)

Student write-up

PS-II project title: Service for abstraction of database operations

Short summary of work done during PS-II: I was assigned to develop 11 APIs handling database operations on 4 tables. These 11 APIs were grouped into 6 types - Get (Basic), Get (Batch), Delete, Update (Basic), Create (Basic) and Create (Batch). I completed coding, unit testing, sanity testing, and beta testing all the APIs. I raised a code review for each API and got all the reviews approved. At the time of writing this summary, I have deployed 7 APIs to

production, and working on deploying the rest as well. I also onboarded clients to use 2 of the APIs for their business requirements.

Tool used (Development tools - H/w, S/w): Kotlin, JUnit, Mockito, Google Guice, Hibernate.

Objectives of the project: Develop a service containing APIs that abstract database operations. This allows clients to simply use API calls rather than handle the logic for database operations themselves.

Major learning outcomes: Gained a lot of knowledge and experience about API development. Understood about how to perform complicated database operations using a combination of code and SQL queries. Also enhanced my communication and collaboration skills through constant interaction with my team as well as external clients.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work at Amazon is very fast paced. There are always deadlines to be met and clients to be handled. Work can get very hectic and we have to manage time very well to ensure that we don't feel stressed.

The technologies used are state of the art and incredible to work with. The quality and standards of code are extremely high as well. The developers and managers are very supportive of the interns and our work. They give us all the necessary resources and are also readily available to help us overcome any roadblocks. Overall working at Amazon is very exciting, but can get hectic if we are not careful about time management.

Academic courses relevant to the project: Good knowledge of Object Oriented programming (CS F213) was necessary, including a decent grasp of Java. Some knowledge about Database Systems (CS F212) was needed to design and optimize queries for database operations.

Name: KUSHAGRA LAVANIA (2018A7PS0216H)

Student write-up

PS-II project title: Slot cancellation and update as part of capacity planning

Short summary of work done during PS-II: Two major projects involving slot cancellation and update as part of capacity planning of customer service agents. It involved writing Java code, unit and integration testing as well as XML models. It also involved formal documentation and code review along with deployment to pipeline.

Tool used (Development tools - H/w, S/w): Git, JUnit, XML, IntelliJ, Cloud desktop.

Objectives of the project: Slot cancellation and update as part of capacity planning.

Major learning outcomes: Java code and testing.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Formal working environment, cordial teammates, team bonding events, regular meetings with mentor and manager were a part of work environment.

Academic courses relevant to the project: DSA, OOP, DBMS.

Name: SHREYANS JAIN (2018A7PS0253P)

Student write-up

PS-II project title: Caching solution for payee management UI

Short summary of work done during PS-II: Deployed a web-cache using AWS ElastiCache, deployed a sync job that runs on a schedule using AWS Lambda and EventBridge, changes in Rails controllers, big part of the internship was to lead design meetings in the team.

Tool used (Development tools - H/w, S/w): Java, AWS CDK, Ruby, AngularJS.

Objectives of the project: Amazon issues payments to various third party entities called payees. The details of these payees are recorded and stored in the payee management UI, which is a web-application my team maintains. Clients can perform various CRUD operations on these payees.

Major learning outcomes: Java, Ruby, AWS ElastiCache, AWS Lambda, AngularJS.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Almost all interns get to work on projects that full-time engineers would usually handle, which means your work matters to your team. Senior SDEs are very supportive in letting you onboard to the internal development tooling, which is quite extensive and has a bit of a learning curve. The expectation from interns is to work more than full-time engineers, but it is possible to manage the work easily in 6-7 hrs per day. Projects are interesting and you'll get to learn about decision making in the corporate environment. You will be the one working on your projects end-to-end, which includes the high level design, organizing team meetings to review those designs (you'll be the one leading these calls), coding everything up and finally deploying it.

Academic courses relevant to the project: OOPS, DBMS, DSA.

Name: MANU GUPTA (2018A7PS0316H)

Student write-up

PS-II project title: LiveHelp chat across MyHR

Short summary of work done during PS-II: During the internship I worked on the 3 tasks which were to create dashboards and alarms, write integration tests and implement CSRF protection mechanisms. After which I started working on my project.

Tool used (Development tools - H/w, S/w): React, Redux, Java, typescript, NodeJS, AWS.

Objectives of the project: Our team develops a tool that provides our employee's various mediums to solve their issues. One of the mediums we provide is live chat with an agent. Currently this feature has few limitations. As part of this project I was given the opportunity to fix the same.

Major learning outcomes: Web development, AWS, Communication skills.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The internship was work from home. The work culture at Amazon was very good, and all the team members were very supportive in all aspects, and helped me a lot.

Academic courses relevant to the project: Software Engineering, Object-Oriented Programming.

Name: Parveen Jakhar (2018A7PS0623H)

Student write-up

PS-II project title: Downtime management

Short summary of work done during PS-II: I started with preparing design of the whole system. Once approved, I created necessary infrastructure using AWS-CDK including tables, lambdas, roles, policies, queues, API Gateway, VPC etc. Then I implemented the whole functionality for scheduling and disabling alarms. The flow is like this: User -> API -> API Gateway -> Lambda -> DynamoDB -> Lambda -> Internal Scheduling Service -> SQS -> Lambda -> CloudWatch -> Email. I tested it thoroughly from end-to-end. Then I worked on creating front-end for that. That was simple compared to back-end because UI had to just show the response of the APIs. Finally with team's approval, it was deployed to production.

Tool used (Development tools - H/w, S/w): IntelliJ, VS Code, Terminal, Git, AWS SDK.

Objectives of the project: During downtime of dependent services, someone from the team has to disable the metric alarms manually. Otherwise, the team gets false severity tickets. This task was painful to on-calls because services generally go under maintenance or downtime at midnight.

Major learning outcomes: I completely owned this project and everything was created from scratch, including creating a package, creating infrastructure through CDK, complex coding, code deployment, API testing, using many of the AWS services and a lot more. This internship helped me in improving my coding, communication, design and presentation skills.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is absolutely stress free. In my team, the work is similar to whatever I have learned in CS CDCs and Electives, except integration with different services. Also, the team members are super helpful and always ready to guide and unblock you whenever required. There is surely a deadline assigned for each task but it is fine to take more time. The only expectation from an intern is to complete the given task keeping in mind the scalability and vulnerability aspect of service.

Academic courses relevant to the project: Following academic courses were relevant to the project: OOPS, SE, DSA and Android development.

Name: D M VISHNU VARDHAN (2018A8PS0855H)

Student write-up

PS-II project title: Unified invoice ingestion

Short summary of work done during PS-II: Amazon has many vendors who supply the goods and services to the company. These vendors are primarily of three types: Digital, Corp and Retail. These vendors offer respective goods and services for which Amazon pays them. The vendors are paid when their invoices are ingested and processed successfully. Currently, each category has a separate channel for ingesting the invoices. With the increase in the number of vendors in each category, the ingestion and processing of these payments has become very cumbersome. Hence there is a need for a standard channel that can ingest and process invoices from all three categories. For this, a service called Unified Invoice Ingestion(UII) service is being developed that can cater to invoices of all types. A service called QR Code decoder, which is part of the UII, had to be implemented as a part of the internship. This QR code Decoder will be responsible for extracting the QR code details from the e-invoices submitted by the vendors for validation purposes. The QR Code will contain information like vendor name, invoice amount and other relevant details in the encoded form required for processing the invoice. My internship was mainly focussed on building this service along with other tasks.

Tool used (Development tools - H/w, S/w): Primarily: AWS Services and Amazon internal tools.

Objectives of the project: To build services that are part of the unified invoice ingestion.

Major learning outcomes: CI/CD engineering practice; Design patterns (Dependency injection, facade, singleton); Programming languages like Java, Kotlin and Typescript; Unit Testing frameworks (JUnit, Mockito); AWS components (AWS compute solutions - Lambda, EC2, ECS, StepFunctions; AWS CloudWatch, Dynamo DB).

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work culture at Amazon was very good, and all the team members were very supportive in all aspects, and helped me a lot with all the basics at the start of the internship. Even an intern is included completely into the team, almost like a full-time employee. I was expected to complete all the projects assigned to me. In addition to this, I also was given routine tasks of the team, such as carrying out production deployments, updating metric dashboards, and reducing software risks of the team's services by frequently updating consumable environments and ensuring latest versions of dependency packages. I also participated in meetings, collaboration hours, design

discussions and operational excellence reviews. My team also had a virtual happy hour meeting scheduled every week to play fun small games.

Academic courses relevant to the project: DSA, OOPS, DBMS.

Name: SAI NAGA SHASHANK SRIRANGAM (2018AAPS0347H)

Student write-up

PS-II project title: Common invoice pipeline

Short summary of work done during PS-II: Create a new API from scratch, setting up alarms and dashboards for various services to monitor them via cloud watch in AWS.

Tool used (Development tools - H/w, S/w): AWS, Git, Brazil cli, AWS cli.

Objectives of the project: Create a new API, alarms and dashboards for different services for the team.

Major learning outcomes: Using git, AWS tools, understanding basic flow of software development.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Depends from team to team, but, interns are also treated as a full time employee and are expected to work in a similar fashion after a month or two. The team was always there to support and help and we're very friendly.

Academic courses relevant to the project: DSA,OOPS.

Name: MUDIT MATHUR (2018AAPS0461H)

Student write-up

PS-II project title: Incident management platformization

Short summary of work done during PS-II: The work involved creating a new platform for Incident Management utility to enable other teams to onboard as clients, which involved setting up a new infrastructure, creating business and evaluation logic for rules setup, check the alarm status/failures in those configured rules and inform the onboarding teams of the outages based on alarm status through the usage of library which is merged directly in client services.

Tool used (Development tools - H/w, S/w): Java, Horizonte (Spring MVC based web framework) back end development platform, JUnit 5 testing framework, Mockito, Dagger, AWS resources, Pipelines.

Objectives of the project: The work involved creating a new platform for Incident Management utility to enable other teams to onboard as clients, which involved setting up a new infrastructure, creating business and evaluation logic for rules configured, check the alarm status.

Major learning outcomes: The main learnings that were achieved within duration of training period are,

- Horizonte (Spring MVC based web framework) backend development platform.
- Junit 5 testing framework.
- Mockito for mocking dependencies.
- ACBDA pattern (Activity layer, Component layer, Builder layer, DAO layer, Accessor layer) for developing services.
- Java design patterns.
- Abstraction favoring development by using interfaces and abstract classes in Java.
- Working with AWS resources like DynamoDB, Lambda, CloudWatch etc.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is pretty decent. You are allowed to work at your comfort as long as you deliver result. You can approach and share your ideas with pretty much every one. The development is fast paced and there is a lot to learn.

Academic courses relevant to the project: Object Oriented Programming.

PS-II Station: Amazon Development Center, New Delhi

Faculty

Name: Sugata Ghosal

Student

Name: NITYA MANGAL (2018A7PS0216P)

Student write-up

PS-II project title: Project primebox & Project resiliency

Short summary of work done during PS-II: I first prepared a low level design for the part I was going to work on. Then I worked on implementing the changes. It involved working with DynamoDB, DynamoDB streams and Amazon SQS. So I got a flavor of working with AWS. Code reviews helped me improve my code quality a lot. I also wrote unit tests and integration tests for any changes that I made. Second project involved working with PWAs. We had to cache the pages to make it work in offline mode. We used IndexedDB as a persistent storage to store the data required for the PWA module to function in offline mode.

Tool used (Development tools - H/w, S/w): Git, IntelliJ IDEA, Android studio, Java, JavaScript, React, Guice, Kinesis Client Library, AWS.

Objectives of the project: Project Primebox - To reduce latency of operations at a delivery station to support various IoT initiatives. Project Resiliency - To make delivery station operations work in offline mode as a part of prime peak readiness.

Major learning outcomes: Worked on backend, frontend as well as android development. Got to experience the complete development lifecycle. Improved code quality a lot to match Amazon's high standards.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: At Amazon, we are given complete ownership of the assigned task. One can reach out to people when stuck, but it is highly encouraged to go through all the available resources first and try to resolve the problem yourself. Reach out to others after thorough research only. Documentation is another thing that's highly encouraged. Everything's very well documented. Things move really fast at Amazon, which is why it might feel a bit hectic.

Academic courses relevant to the project: Data Structures and Algorithms, Object Oriented Programming and Computer Networks.

PS-II Station: American Express - AI Lab, Bengaluru

Faculty

Name: Ambatipudi Vamsidhar

Student

Name: ROHAN MAHESHWARI (2017B4A70965H)

Student write-up

PS-II project title: Segment wise analysis using multi-output models

Short summary of work done during PS-II: My work was primarily focussed on creating a model that can distinguish "segments" of data i.e., change in data occurring due to shift in some variables distribution's. We first worked with synthetic data to fine tune the model and then worked on company data to see how the model was performing on huge real-world datasets. I was also responsible for adding TreeSHAP Interaction Value support for an internal XGBoost implementation.

Tool used (Development tools - H/w, S/w): ML Studio

Objectives of the project: Create a model that could distinguish between segments of data separated by change in distribution of the variables.

Major learning outcomes: Multi-output models, combining entropy functions for a unified information gain metric, model explainability, SHAP values.

Details of papers / patents: NIL

Brief description of working environment, expectations from the company: People at Amex were quite helpful and motivated, the culture puts more emphasis on quality of work rather than hard deadlines. Even though, I was working in online environment, interactions with colleagues were quite smooth and engaging.

Academic courses relevant to the project: Machine Learning, Optimization.

Name: SHUBHAM AGARWAL (2018A7PS0301P)

Student write-up

PS-II project title: Document intelligence services

Short summary of work done during PS-II: Document Intelligence services aim to deal with document data using intelligence that is powered by cutting-edge AI techniques. With the increasing use of digital documents for various purposes, the user uploaded data usually contains multiple documents like ID, Bills captured together on the same image. Also, most of the downstream analyses and works primarily require only specific fields and information to be extracted from such documents. Any manual solutioning or rule-based automation fails to carry out these tasks due to the vast diversity of input data that is being dealt with in the industry. The work done during PS-2 aimed to automate these document processing workflows using some state-of-the-art Deep Learning techniques like Computer Vision, and Natural Language Processing. A major part of my work revolves around these two projects that concluded with two end-to-end production-ready prototype solutions.

Tool used (Development tools - H/w, S/w): Python language, Deep learning libraries like Keras, TensorFlow, PyTorch, numpy, pandas, object detection models, multimodal transformers, etc.

Objectives of the project: Automate various document processing workflows using state-of-the-art deep learning techniques.

Major learning outcomes: Exposure to research, and learnt about the use of AI and ML technology in the real-world problems for business use-cases.

Details of papers / patents: Idea for a review paper has been proposed based on the works done during PS-2.

Brief description of working environment, expectations from the company: The work culture is great and offers flexible timings for work. Everyone is very cooperative and understanding. Also, a lot of cutting edge research based work is going on in most of the teams. Also, the organisation has been hiring across various levels.

Academic courses relevant to the project: Artificial Intelligence, Machine Learning, Deep Learning, Data Structures and Algorithms, Image Processing.

PS-II Station: American Express - AI Labs, Gurugram

Faculty

Name: Ashish Narang

Student

Name: ATHARVA ANAND JOSHI (2018A3PS0515P)

Student write-up

PS-II project title: RNN self learning template

Short summary of work done during PS-II: My project was focused on developing a Self Learning Framework. Self Learning / Continual Learning is an end-to-end ML pipeline, which enables automatic model retraining on a continuous stream of fresh data. It saves a lot of computational resources and makes the process of model deployment much more efficient. I worked mostly on the backend training codes, stitching together of the steps of the pipeline using Airflow and automatic validation of the Self Learning Pipeline. I also created a few Self Learning Pipelines out of simple examples as well as Amex-specific production use cases. We used these to later demonstrate the working of the framework to modelling teams and higher leadership.

Tool used (Development tools - H/w, S/w): Python, PySpark, Spark SQL, Hive, JupyterLab, TensorFlow and Keras, Git, Airflow.

Objectives of the project: Developing a framework that allows users to seamlessly deploy end-to-end Continual Learning pipelines for their Sequence Deep Learning models.

Major learning outcomes: Good understanding of their enterprise AI/ML platform: Both functional and technical aspects, applications of MLOps and Big data in real-world scenarios: For instance, predicting the probability of credit default by a customer.

Details of papers / patents: None

Brief description of working environment, expectations from the company: American Express has a wonderful employee-friendly work culture. There is effectively no difference between an intern and a full-time employee here. You get enough freedom to make decisions and explore new approaches in your project. Employees are encouraged to maintain a good work-life balance and take some time out for personal development and recreation. The work deadlines were not difficult to achieve. My teammates were very approachable and helpful. I got ample time to brush-up on concepts and learn new skills on the job. My manager placed a high emphasis on understanding where our work fits in the big picture.

Academic courses relevant to the project: OOP, NNFL or DL, ML, FDS.

PS-II Station: American Express - Credit & Fraud Risk (Capabilities), Bengaluru

Faculty

Name: Ashish Narang

Student

Name: R MRUNALINI (2017B5AA1616H)

Student write-up

PS-II project title: Big data analysis and management

Short summary of work done during PS-II: I worked in the Data Steward team that is in charge of several daily refresh tables. I worked on understanding and clearing data metric alerts when we noticed variables behaving out of order and in enhancing the tool that generates the alerts to minimise the number of false alerts received.

Tool used (Development tools - H/w, S/w): HiveQL, PySpark, PostgreSQL.

Objectives of the project: Enhancement of an internal tool to reduce the number of data metric alerts.

Major learning outcomes: HiveQL, PySpark, PostgreSQL.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The team expects someone enthusiastic and hard working who would complete any given the task in the time frame provided.

Academic courses relevant to the project: DSA, DBMS, OOP, OS.

Name: UTKARSH KUMAR SINGH (2018A3PS0368P)

Student write-up

PS-II project title: Data analysis for authorization modernization programme

Short summary of work done during PS-II: Credit default models need multiple indicators, my job was to create the data for different months for these indicators. Previous project included working on online-offline scorematching(validation) process for other credit default and total structural risk models. Other minor projects/daily tasks were also given along the way, none too significant or particularly difficult. Fairly run-of-the-mill stuff.

Tool used (Development tools - H/w, S/w): HiveQL, PySpark, SAS.

Objectives of the project: New variable creation to be used in credit default models, score-match and validation process, identifying and collating mismatches in old and new data sources.

Major learning outcomes: HiveQL, PySpark, Organizational communication and collaboration.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very collaborative and supportive environment, ample time is given to familiarize with tech stack and project(s) allotted. Interns are assigned a mentor who keeps in constant touch and typically huddles are held daily to keep track of the progress.

Academic courses relevant to the project: DSA, OOP.

PS-II Station: American Express - Credit & Fraud Risk (Capabilities), Gurugram

Faculty

Name: Ashish Narang

Student

Name: AASHYA (2017B5A30981P)

Student write-up

PS-II project title: 1) Automation of ownership certification for users
2) Building capability to create performance files for users

Short summary of work done during PS-II: I worked on two projects. In the first one, I created an API to find the incorrect email configurations so that they can be corrected and validated in order to ensure that the right users are configured to handle any alert properly. In the second one, I built the Hive code to find out the defaulters who need to be written off in 24 months to ensure minimum losses.

Tool used (Development tools - H/w, S/w): Java, Hive, SQL.

Objectives of the project: 1) To automate the certification process in order to find the incorrect user configurations. 2) To build a capability in order to create performance files for International Consumers and Small Business Services with definition of write-off in 24 months.

Major learning outcomes: 1) The importance of maintaining data integrity and quality to ensure timely action on issues.
2) System flow of finding out the defaulters and various conditions that are used in the process.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: I find the environment and the work culture of the company to be satisfactory.

Academic courses relevant to the project: I will say the academic courses do layout a base or foundation in some sense in order to work on real time projects.

Name: RISHAV DATTA (2018A3PS0910H)

Student write-up

PS-II project title: Automate US CPS ADSS model data creation

Short summary of work done during PS-II: My project involved two parts- creation of a table containing all the necessary variables and using this table to automate the entire modeling data creation process. The data creation process was done in SaS. After that the various modules present in the modeling data creation process were automated using pyspark.

Tool used (Development tools - H/w, S/w): Python, Hive, SaS, Excel.

Objectives of the project: 1) Create Analytical Data Layer (ADL) which will be used as a source for all the modeling and performance variables needed in the US CPS ADSS model creation process. 2) Create the end-to-end data automation tool to automate creation of US CPS ADSS modeling.

Major learning outcomes: 1) Real time project experience. 2) Exposure to Big data capabilities like Hive, Python, Spark. 3) Managing projects within tight timelines. 4) Managing end-user expectations and building products as per their requirement and ease.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was really nice at American Express. I had the freedom to approach my mentor or manager anytime I had some doubts or was stuck at a problem. I had daily connects with my team where all of us gave updates about the current status of our work. I spent the first week in the internship doing some mandatory training courses(related to laws and regulations). After that I was allotted my project, the whole project was divided into multiple parts and there was a deadline for each part. The deadlines were manageable and I always had the help of my mentor to complete the work in before the deadline. The company expected us to be well versed in python, SQL and ML basics.

Academic courses relevant to the project: Foundations of Data Science, Machine Learning.

Name: HITESH ARYAN ACHARYA (2018AAPS0384H)

Student write-up

PS-II project title: Credit and fraud risk (Capabilities)

Short summary of work done during PS-II: Amex holds a lot of records and data in data warehouses in the form of variables. Some variables, in due course of time, become redundant and ineffectual. Imperatively, such variables are removed to maintain sanity of data and reduce the storage. My job was to identify these variables using Python and align with partners to decommission such variables. I was also assigned work to migrate data from an older platform to a newer one to better analyze the risks Amex undertake during different transactions.

Tool used (Development tools - H/w, S/w): Python (PySpark), YellowBricks, SQL, Hive.

Objectives of the project: Clean the databases by removing redundant data. Also assess the risk factor by analyzing the risks in AMEX transactions.

Major learning outcomes: Data analysis; SQL; Big data analytics.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Amex has a very good working culture. You're treated as an employee and everyone around is happy to help.

Academic courses relevant to the project: DBMS will help you in SQL coding but other than that you learn on the go.

Name: MARYADA SAHITHI REDDY (2018AAPS0467H)

Student write-up

PS-II project title: Forecasting tool: Model integration and feature development

Short summary of work done during PS-II: I have developed a new feature that further customizes the input macros that will give more leverage to the user. I have re-versioned the entire tool package and integrated new generation models into the same.

Tool used (Development tools - H/w, S/w): Languages: Python- PANDAS, PySpark, SQL basics; Tools: ML studio, WinSCP, Hive, PuTTY, Excel.

Objectives of the project: To develop new features to the forecasting tool as per the requirements from the stakeholders.

Major learning outcomes: I've gained insights into AmEx, its organizational hierarchy, teams and working. I've upskilled my proficiency in python programming and data analysis. I've developed critical work habits; I see myself more proactive and communicating better.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: AmEx expects basic technical skillset along with strong communication and proactive interaction with the team. My team director always emphasized on the value I add to the project with the fresher perspective. The entire team is super-friendly and accommodative. I never felt left alone being an intern among the FTEs.

Academic courses relevant to the project: DBMS.

PS-II Station: American Express - Customer Servicing Management (Project 1), Gurugram

Faculty

Name: Ashish Narang

Student

Name: VYSHNAVI S K (2018A3PS0619H)

Student write-up

PS-II project title: Servicing personas using unsupervised learning and word cloud trending model

Short summary of work done during PS-II: Worked on two major projects: Servicing personas using unsupervised learning and creating Word Cloud trending model. The work is basically comes under Big data and advanced analytics. You need to learn Pyspark for the same, which is easy enough if you are good with Python and SQL. Servicing personas is basically a customer segmentation project which involves experimenting with several Unsupervised Learning methods to get the best business centric servicing clusters. The second project leverages multiple NLP techniques to get top trending words/form a word cloud of the transcripts from the customer care calls.

Tool used (Development tools - H/w, S/w): PySpark, HIVE, Python, SQL, Excel.

Objectives of the project: 1. Revamping Personas to a newer time period, using a new unsupervised learning technique to keep up with current trends and get clear and significant cluster cuts. 2. To get the top 200-300 trending words spoken by agents and customers on a weekly basis.

Major learning outcomes: 1. Working with big data. 2. Leveraging state-of-the-art NLP techniques like Word Cloud, NER etc. 3. Implementing Python ML in Pyspark.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Amex has a wonderful Work-Life balance. Hustling through the weekdays sincerely is worth the output and contribution we make to the company. Could work on very interesting, state- of-the-art, major impact projects and also easily work/talk with high position leaders who gave us quality feedback. One of the best companies to work for, PPOs are offered if you work hard enough and be smart in your approach to solving problems. WFH was a smooth process. Fun social events are organized by the CEG Team to facilitate fun and interaction between different bands of colleagues.

Academic courses relevant to the project: Machine Learning, FoDS, Natural Language Processing.

PS-II Station: American Express - Customer Servicing Management (Project 2), Gurugram

Faculty

Name: Ashish Narang

Student

Name: AETURI NAGA PAVAN KALYAN REDDY (2018A7PS0212G)

Student write-up

PS-II project title: Sentiment analysis of call transcriptss using nlp techniques

Short summary of work done during PS-II: With the use of XGBoost Model I was able to boost the model performance when compared to the current model helping better classify the sentiment of call transcripts. With the increasing importance of decisions being made by models, having an understanding of why and how the prediction was made becomes increasingly valuable. The strengths and weaknesses of the explain ability techniques must be examined thoroughly so as to ensure that these techniques can be applied effectively and the explanations which these techniques provide are trust-worthy themselves. When equipped with the right explain ability technique modellers across the enterprise can be confident about their models before deployment. With trustworthy explanations modellers can tweak their models to improve performance. The major benefit of explain ability would be the ability to build trust in the end user, the customer's trust is something which is paramount to the organization. I am glad that I was able to add MLFlow to the team's benefit, With the help of focal loss we were able to achieve our results with fair accuracy and f1-score without thresholding. With the duplication logic that I proposed we were able to remove almost 98% of the duplicate transcripts away from modelling. All in all this was a fun and fruitful experience with a lot of learnings.

Tool used (Development tools - H/w, S/w): Python, Pyspark ,Hive, GPU scripting.

Objectives of the project: Understanding of why sentiment analysis and what is our concern? Understanding challenges in sentiment analysis, exploring Xgboost and Random Forest techniques for sentiment analysis, Identifying metrics for evaluating performance, Testing available explain.

Major learning outcomes: Boosting techniques, Explainability tools, working on bias dataset, focal loss, deep learning.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is good. Mentor, manager were quite supportive through out the internship. They believed in me and what I am capable of and provided freedom to explore different techniques in regards to the project.

Academic courses relevant to the project: Yes

PS-II Station: Analog Devices India Pvt. Ltd., Bengaluru

Faculty

Name: Sanjay Vidhyadharan

Student

Name: DEVANSH GUPTA (2018AAPS0275G)

Student write-up

PS-II project title: Creating power quality software library

Short summary of work done during PS-II: Worked mostly on software end of designing an embedded system on STM32F413zh microcontroller. Extensively used CMSIS library provided by ARM to implement multiple IIR filters. I closely worked on improving the code quality by reducing the memory and timing overheads.

Tool used (Development tools - H/w, S/w): C, Python, Swigwin, ARM Cortex M4, ADE9430 IC, Keil micro-vision.

Objectives of the project: Create a software library for energy meters to meet IEC61000-4-30 power quality requirements.

Major learning outcomes: Embedded programming, ARM processor architecture, Code debugging, Process automation using python.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment was very good and friendly. Colleagues and seniors were very supportive and always ready to guide whenever necessary.

Academic courses relevant to the project: Embedded system design, Microprocessors and interfacing.

PS-II Station: Anand Automotive, New Delhi

Faculty

Name: Sudeep Kumar Pradhan

Student

Name: DESAI ANKIT SATISH (2020H1060135G)

Student write-up

PS-II project title: Life cycle assessment of BANJO Axle manufactured at DA IPL

Short summary of work done during PS-II: Initially went through lot of research papers to understand Life Cycle Assessment (LCA) methodology which comes under ISO:14040:2006. Additionally, I went through some case study regarding LCA on Automotive Component to get in detail idea about the implementation of the LCA tool. Gathered data from DANA ANAND India Pvt. Ltd. related to Axles manufactured. Understood the product and accordingly designed a flow to conduct the LCA. Programmed a group level Carbon Footprint calculator which helped to quantify carbon emission.

Tool used (Development tools - H/w, S/w): MS Excel with basic VBA & Macros, MS PowerPoint, Latex for report.

Objectives of the project: Assessment of each phase of the Life cycle of BANJO Axle w.r.t environment. Carbon Footprint is one of the main parameter to measure environmental impact due to numerous phases of a product. In case of any auto ancillary industry, 5 major phases are:
1. R.

Major learning outcomes: Sustainability, LCA, Axle production, MS Excel (For automation and carbon footprint calculator) & basic VBA, Macros, MS PowerPoint, Drive train system.

Details of papers / patents: Life Cycle Assessment of BANJO Axle manufactured at DA IPL.

Brief description of working environment, expectations from the company: ANAND Corporate Office located at Chakan, Pune has a positive work culture. You get to interact with all the Senior category members such as Chief executives, VPs, Executive officers etc. You can expect great advises and suggestions from them as well as learn about leadership, execution strategy, business management and how to represent yourself in front of Senior and Execution board. One major advantage of working in ANAND Corporate is that you have freedom to visit all the group companies such as, DANA, MAHLE ANAND Thermal systems (MATS), MAHLE ANAND Filter systems (MAFS), Gabriel etc. Great learning experience!!!

Academic courses relevant to the project: A bit relevant to Product Design Engineering (Comes under Environmental Design).

Name: VIRAL RAJULAL MALI (2020H1060149G)

Student write-up

PS-II project title: Heijunka frame and cost of quality

Short summary of work done during PS-II: Got indepth knowledge of importance of implementing Heijunka frame in production plant and comparsion with traditional production planning. Analysis of cost that been utilized by the organization in manufacturing a good quality product on the basis of different factors.

Tool used (Development tools - H/w, S/w): Microsoft Excel.

Objectives of the project: Cost of quality: The sole objective of conducting quality cost analysis is to ensure that the product to be delivered is a reliable one and it has a long-term impact on the minds of the end users. These costs must provide a realistic analysis or measureme.

Major learning outcomes: Importance of Heijunka frame and implementation of cost of quality.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work culture at Anand Corporate office was extremely good. The organization gave an excellent opportunity to interact with all the senior-level people and were cooperative in making things understood at the easiest level they can.

Academic courses relevant to the project: Product design.

Name: AKSHAY REMA (2020H1060150G)

Student write-up

PS-II project title: Deep learning based defect detection system

Short summary of work done during PS-II: I was part of team (Central Technical Services Department) that was handling the job of developing an existing Inspection POC setup with novel Deep Learning techniques so as to automate it. The task involved conducting a preliminary exhaustive defect analysis study of the Object (Piston rod) to gauge the frequency of occurence

of defects along the surface of the rod. This is followed by Setting up Image Acquisition setup with plan of mounting stations for camera and rod. The Assorted setup is utilized to capture more than 7000 images with annotation by VIA tool. The Deep Learning model (DL) - image instance segmentation is then trained from scratch for the custom dataset with optimal metric evaluations. The end of the project is marked by fine tuning the DL model according to a Automate 4 step plan (Fine tune accoring to Shop floor standards).

Tool used (Development tools - H/w, S/w): IV2 Vision Sensor camera, OpenCV, Deep Learning, Computer Vision, VIA annotator, Python.

Objectives of the project: To design an AI visual inspection system that detects surface defects of piston rods within shock absorbers assembly.

Major learning outcomes: Learnt about quality standards followed in defect detection technology. Development of standard POC (Proof of Concept) inspection setups with the aim to automate them and provide development in terms of efficiency standards.

Details of papers / patents: None

Brief description of working environment, expectations from the company: It was a learning experience with the freedom to explore new frontiers and ideas concerning project variables. Priority is given to research implementation and practical industrial applications.

Academic courses relevant to the project: Statistical Quality Control.

Name: JAI KRISHNA A (2020H1410084G)

Student write-up

PS-II project title: Valve tuning of train - 18 railway dampers

Short summary of work done during PS-II: Tuning of Train – 18 Yaw Dampers at velocities 0.01m/s and 0.1m/s as per the requirement form ICF. (96 Trials) Fine Tuning of Train – 18 Yaw dampers at velocities 0.01m/s, 0.02m/s, 0.03m/s, 0.04m/s, 0.05m/s, 0.1m/s, 0.2m/s and 0.3m/s (88 Trials) and Primary Vertical Dampers at velocities 0.01m/s, 0.05m/s, 0.1m/s, 0.2m/s and 0.3m/s (75 Trials). Repeatability Testing of Train – 18 YAW Dampers (8 Dampers) Repeatability Testing of Train – 18 PVD Dampers (5 Dampers) Tuning of WAG – 9 Primary Vertical Damper (18 Trials), Secondary Vertical Damper (65 Trials), Secondary Horizontal Damper (73 Trials). Benchmarking of KONI LHB Primary Vertical Damper. Compilation and preparation of Test Reports for customer Inspection. Preparation of Name plate and Roll Marking Designs. Preparation of LHB Dampers Service Manual for Indian Railways.

Tool used (Development tools - H/w, S/w): MTS Damping force testing machine (R&D), Assembly of dampers by hand using various machines in R&D Lab, Catia and AutoCAD for preparation of drawings.

Objectives of the project: To develop the dampers for the Train - 18 or Vande Bharat EMU introduced by Indian Railways.

Major learning outcomes: In-depth knowledge of Hydraulic dampers. Product development activities such as sourcing, tuning, sample development, conducting various performance tests, preparation of test reports, preparation of drawings of the child parts etc. Benchmarking activities.

Details of papers / patents: NIL

Brief description of working environment, expectations from the company: The engineers in R&D are supportive and let us try everything on our own and interfere only when necessary. In R&D, they give the freedom for the interns to explore and experiment anything. Fully loaded railway dampers would weigh nearly 19kgs. Tuning involves lifting them and mounting them on the vice to open and tune. Must be ready for such heavy physical tasks especially in R&D.

Academic courses relevant to the project: Product Design.

PS-II Station: ANS Commerce - Business Growth & Product, Gurugram

Faculty

Name: Sandeep Kayastha

Student

Name: GYAAN SINH AATREY (2018A1PS0920G)

Student write-up

PS-II project title: Business growth

Short summary of work done during PS-II: Did backend and frontend work on website for different brands, made different types of business report, coordinated with marketing, tech and catalogue team for different types of task, did SEO related work for different brands, attended clients meetings to understand business strategy. Also made daily tracker of metrics which helps in understanding day to day progress. Analysed FB, Google, Flipkart and Amazon Ads performance. Understood how to make marketing plan. Made various detailed report on Facebook and Google campaigns.

Tool used (Development tools - H/w, S/w): Kartify.

Objectives of the project: To generate revenue, lead through digital marketing and marketplaces

Major learning outcomes: 1. Digital marketing (FB Ads, Google Ads, marketing plans) 2. SEO 3. Website management.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Since the internship mode was online, therefore I couldn't explain in brief but the seniors, managers all were supportive, they all were ready to listen my ideas, always gives feedback on where to improve and appreciate for good work that adds value to them. Other department seniors were also supportive. As of now the company is hiring more employee as they are planning expand because of acquisition of Flipkart. Right now they have around 150 clients, but after sometime they will face more than 300+ clients.

Academic courses relevant to the project: No

Name: AYUSH SONI (2018A1PS0941G)

Student write-up

PS-II project title: Business model of ANS

Short summary of work done during PS-II: I was responsible for speaking with the brand SPOCs and business directors to handle their needs about websites and tasks related to brands in general. Aligning the tasks to proper teams and following up about the progress and delivering the results to the client was a major part of the internship. I got to work with the project team, creatives team, tech team and the product team during my duration at ANS. Cataloging was also one of the major tasks which involved proper communication with the brand to ensure timely deliverables and taking the products live on the website for revenue generation.

Tool used (Development tools - H/w, S/w): 1. Kartify 2. ASANA 3. Sublime Text 4. Google Ads 5. FB Ads.

Objectives of the project: Maintain and grow brand relations, brandstore management, revenue generation.

Major learning outcomes: 1. Stakeholder management 2. Website management 3. Ecommerce functioning 4. Performance marketing.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment was friendly and helpful. The seniors were always ready to support and guide whenever needed.

Academic courses relevant to the project: No courses were relevant.

PS-II Station: ANS Commerce – Non-Tech, Gurugram

Faculty

Name: Sandeep Kayastha

Student

Name: KOTHA SAMCITHA REDDY (2017A5PS1167H)

Student write-up

PS-II project title: Lead generation

Short summary of work done during PS-II: I worked on many potential D2C brands, involves obtaining contact details through sales navigation tools, appropriation of content through proposed communication channels, campaigning, validation of outbound and inbound tools, developing procedure for outbound lead generation to avoid gray area, evaluation of channels of communication .Dealing with client and checking if they can make SQL and MQL, once a client is qualified enough they are added into sales pipeline, immediate step would be creation of deals for greater accountability. I handed over 2-3 clients on weekly basis to inside sales manager while

adding detailed notes. My data set includes 1000+ leads involving around 500 brands. The domain of high-end brands contacted contains Unilever, P&G, Dabur, Reckitt and many more.

Tool used (Development tools - H/w, S/w): CRM management, Google data studio, Power BI, Asana, Google analytics, Excel, PowerPoint.

Objectives of the project: To draw potential D2C brands out and hand them over to end sales department.

Major learning outcomes: Working of CRM software, content creation, client management, presentation skills, database management, E-Commerce, team work.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Working environment was highly supportive and friendly. Founders of ANS Commerce look into most details and steps taken, so I had to say the chances of getting your work right is quite high. Mentors and seniors are always open to suggestions and provide us to think unconventionally also a great opportunity to grow, explore your creative skills and troubleshooting. Expectations are to be proactive, keep up with deadlines and reach out to mentors when situation demands.

Academic courses relevant to the project: None

PS-II Station: Apple India Pvt. Ltd., Hyderabad

Faculty

Name: T Venkateswara Rao

Student

Name: NIKHIL KUMAR (2017B5A70658P)

Student write-up

PS-II project title: Distributor data pipeline development

Short summary of work done during PS-II: The team I interned with works on building scalable distributed systems to process and analyze large amounts of sales data from Apple's resellers. My role was to conceptualize, design and develop software to automate the ETL process for distributor data, according to requirements given by the business team. I worked mainly with Scala, Apache Spark and an internal framework. This was my second semester at Apple. I also continued to work on the project I had taken up last semester, involving the actor model and reactive streaming.

Tool used (Development tools - H/w, S/w): Scala, Apache Spark, an internal framework, Apache Kafka, Amazon S3, Teradata, some Shell scripting, Maven, Git.

Objectives of the project: Automation of processing and storage of distributor data.

Major learning outcomes: Data parallelism, data engineering, batch / streaming ETL.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Autonomy and expectation of high levels of ownership. By far the best aspect of the internship. I got to design, develop and deploy to production a project with real business value to the organization. If you like being entrusted with responsibility, figuring things out for yourself and working with a smart team, you will enjoy your time here and learn a great deal.

Academic courses relevant to the project: Object Oriented Programming, Database Systems, Data Structures & Algorithms, Functional Programming (not a formal course on campus, but some background is useful as Scala has a lot of influence from FP).

Name: VYBHAV JAYASANKAR (2018A7PS0152G)

Student write-up

PS-II project title: Cannot disclose

Short summary of work done during PS-II: I worked with Adobe Experience Manager (AEM). My project was a learning-oriented project, in which the main focus was for me to become comfortable with AEM. I had to integrate an existing tool into an AEM project, which involved code reviews of the existing application. Reusing existing solutions was also a focus of my project, so I had to review several existing applications/projects and see if they could be used directly / adapted for my project.

Tool used (Development tools - H/w, S/w): Adobe experience manager, Java, OSGi, Apache Sling, Sightly (HTL).

Objectives of the project: Get familiar with Adobe experience manager and its tech stack, and then use this knowledge to integrate an existing internal tool into the AEM framework.

Major learning outcomes: 1. Adobe experience manager as content management solution.
2. Java, OSGi specifications, Apache Sling, HTL.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: My team - my mentor in particular was very helpful and was my point of contact for any technical and non-technical questions. Work-life balance is good. I was expected to take the initiative in deciding the direction of the project to a large extent - the project wasn't just a list of pre-decided tasks that I had to complete. While questions are encouraged, interns are also expected to be able to brainstorm and try and solve a problem on their own. I had an individual project and had to work on my own most of the time, which meant a lot of the design decisions were left to me.

Academic courses relevant to the project: NA

Name: NAVANEETH RAGHUNATH (2018A7PS0185P)

Student write-up

PS-II project title: Application of Graph Neural Networks in Clustering of Social Media Data

Short summary of work done during PS-II: The project was organised in a three phase manner, as a logical progression from the conceptualisation to the execution stage. The objective was to come up with an implementation using Graph Neural Networks that would enable the clustering of Apple-related mentions in Social Media data from Twitter, Reddit, Facebook etc. into thematic clusters. The first phase comprised a literature review, going through the state of the art implementations in the area of Graph Neural Networks. The second phase involved selecting and implementing a GNN model and training it on the given data. The final phase involved deploying the model in the team's pipeline, and building a GUI tool as a frontend for making use of the model's outputs.

Tool used (Development tools - H/w, S/w): Hardware : 1 Apple MacBook Pro, Software : Xcode, VSCode, Jupyter Notebooks, Quip, Webex.

Objectives of the project: Apply Graph Neural Networks to the domain of Social Media Clustering, and build a self-contained tool for cluster-based analysis of Social Media data.

Major learning outcomes: Python, PyTorch, Deep Learning Algorithms, Graph Neural Networks, Clustering Algorithms.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment was excellent, and the team was very warm and welcoming right from the start. The goals and expectations from the project were clearly laid out from the beginning, and there was

an amazing atmosphere to work, learn and have fun too. Everyone was very approachable, and the avenues for picking up new skills and knowledge were plentiful.

Academic courses relevant to the project: Machine Learning, Neural Networks and Fuzzy Logic, Data Structures and Algorithms, Database Systems.

Name: HIMANSHU PANDEY (2018A7PS0196P)

Student write-up

PS-II project title: Gamification framework

Short summary of work done during PS-II: Both the backend services as well as the UI of the framework were developed from scratch. A seamless onboarding framework and integrations with 3rd party apps were also done. Furthermore, some collaboration features were also built within the framework.

Tool used (Development tools - H/w, S/w): HTML, CSS, JavaScript, Springboot, Node.js, MySQL.

Objectives of the project: The objective of the project was to develop a framework which can help enhance user engagement of existing Apple tools.

Major learning outcomes: The project vastly improved my overall technical cognizance as it involved learning many new technologies and frameworks. I also improved my skills of understanding business requirements and selection of critical tasks. Furthermore, working at Apple also helped improve my overall project presentation skills. Finally, I got the opportunity to interact with many talented people and benefitted greatly from their expertise and experience.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The company had a great working environment with lots of opportunities for learning new things. People were easy to approach and very helpful.

Academic courses relevant to the project: Computer Programming, Object Oriented Programming, Database Systems, Data Structures and Algorithms.

Name: SAVIO JOMTON (2018A7PS0227G)

Student write-up

PS-II project title: Developing an internal tool for social media publishing

Short summary of work done during PS-II: This was proof of concept for a new project, we worked on developing both a back and frontend. The backend was a microservices based application built using Java and Spring Boot. The frontend was a React app written in Typescript.

Tool used (Development tools - H/w, S/w): Java, Spring, Spring Boot, MongoDB, HTML, CSS, TypeScript, React, Redux.

Objectives of the project: To develop a proof of concept for an internal service that can be used for social media publishing.

Major learning outcomes: 1. Technical skills: Experience developing using Java, Spring, Spring Boot, MongoDB, HTML, CSS, JavaScript, TypeScript, React, Redux. Industry best practices.
2. Communication and presentation skills: Talked with various stakeholders to get an idea of the features that they are expecting. We also presented our work to multiple teams.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Being almost entirely WFH, we could not experience the actual work environment. Given the basic idea of the

project, we were given full freedom to choose what features that we want the proof of concept to have, how to implement them etc. We were given ample time to learn about the various technologies that we would be using.

Academic courses relevant to the project: Database Systems, Computer Networks, Data Structures and Algorithms.

Name: ADITYA DESHMUKH (2018A7PS0246P)

Student write-up

PS-II project title: Image compression techniques for HEIC and JPEG images

Short summary of work done during PS-II: Work towards building new compression schemes so as to optimise device storage by reducing file size.

Tool used (Development tools - H/w, S/w): Xcode, Anaconda, Python, Swift, Objective C.

Objectives of the project: The aim of the project is to study various image compression algorithms currently employed and work towards building better techniques for image compression.

Major learning outcomes: Image Compression Techniques, Codecs, Different file formats and their compression schemes, good software development practices, iOS development, Machine Learning modelling.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment is good, the mentors, managers and other colleagues are very friendly and will help you whenever you reach out to them. The expectations are very high, because of the high work standards.

Academic courses relevant to the project: Image processing, Pattern recognition, OOP, DSA, OS, Computer architecture.

Name: MEREDDY AISHWWARYA REDDI (2018A7PS0276H)

Student write-up

PS-II project title: Reactive database

Short summary of work done during PS-II: Used a latest technology R2dbc which can replace the existing JDBC to achieve better performance in reactive application. Tested multiple combinations of the supporting technologies on top of R2dbc to achieve the best model. Performed thorough load and stress testing and compared both the technologies. Implemented a smaller version of MyBatis technology that suits best for the usecase. Made a working POC, developed and compared 8 different models to find the suitable one for our application.

Tool used (Development tools - H/w, S/w): Technologies: Java, Gradle, Spring webflux, SQL IDE/Tool: IntelliJ, Jmeter.

Objectives of the project: Build a POC using reactive database to improve performance of the reactive application.

Major learning outcomes: REST APIs, Backend development, Databases and application connectivity.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Good team culture, team members are helpful and guide you when stuck, regular meetings to track progress, enough time to ramp up with the new technologies. Importance to the presentations to the upper management.

Academic courses relevant to the project: OOP, Database systems.

Name: RUPSA DHAR (2018A7PS0376H)

Student write-up

PS-II project title: Text recognition using OCR technology

Short summary of work done during PS-II: The project aims at trying to harness the power of OCR technology (Optical character recognition) to be able to detect text from certain datasets of images used by an important Apple application. The model will help speed up the process of using this text from images and also remove the manual labour that would otherwise be needed to do the same. Craft Algorithm forms the backbone of our model which is further supported by grouping algorithms that print the appended outputs according to their affinity and need. The type of image dataset further dictates the post-processing function that will help give us the correct output for that specific type of image. Further, since the model has been deployed into production, the metrics have been evaluated and further feedback is awaited. Error-handling has also been given priority to help understand the short-comings of the model by more specific error messages.

Tool used (Development tools - H/w, S/w): Python, PyCharm, PyTorch, OpenCV, Postman, Company internal tools for deployment and testing, Jupyter Notebooks.

Objectives of the project: To develop an OCR based text recognition model to efficiently and accurately read text from natural images. The text recognized will be further used by an important Apple application to improve data and user experience.

Major learning outcomes: The project was in the Machine Learning domain. During the course of the project, I learnt about OCR technology in detail and how different OCR modules work to implement a solution. Also, since we were handling images, I got acquainted to a lot of image processing techniques. All of the code was written in Python. I also learnt how to start a model from scratch and deploy it to Production in an end to end flow. At Apple, we were given the responsibility to handle real-time projects and this really helped me gain a hands-on-experience

based on how the ML model pipeline looks like from its development to its deployment. Being a part of a global team, with team members both in India and US, I developed better skills in terms of effective communication and collaboration. Working to improve an important Apple application that has millions of users every day was an amazing and an overall great learning experience.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work environment was great. We were allotted mentors and buddies who would help us for all doubts both technical and general. We would have meets with our managers in regular intervals to give updates as well as to help clear any apprehensions about work. Working in a global team, we were responsible for our project on a large scale and had to talk to many people across teams, helping us gain a lot of exposure. In terms of company expectations, we had to try our best to complete a task and in case we were stuck, we were encouraged to reach out for help. Everyone, in the team and across, was very eager to help and I had no problem in getting work done. I had worked at the office in Hyderabad for a month, and it was a great experience, collaborating with the team in real-time. We had presentations to various leadership panels towards the end of our internship and that helped us gain a lot of confidence.

Academic courses relevant to the project: Foundations of Data Science, Machine Learning, Applied Statistical Methods, Software Engineering, Database Systems.

PS-II Station: Arup India Pvt. Ltd., Hyderabad

Faculty

Name: Naga V K Jasti

Student

Name: DONNIE SIMON (2020H1060279H)

Student write-up

PS-II project title: Introduction to Oasys suit, Ansys mechanical and LS Dyna

Short summary of work done during PS-II: I have done the internship in the technical support team of Arup India. The internship started with 3 weeks of Oasys suit software training. Oasys suit is a cluster of pre, and postprocessor used for engineering analysis applications. After the training in PRIMER, D3Plot, T/HIS I got the basic understanding of the capabilities of these software's and also how to setup a model and do the analysis. After that hypermesh and LS pre-post training were given. Hypermesh is an advanced meshing software used for creating a structured mesh in complex geometries. Most part of my internship was on learning Ansys Mechanical for the company's future support role. As a member in Ansys channel partner, I accessed the Ansys Learning Hub courses to learn the new tools and understand the concept in depth. After this training I am confident enough to support in structural analysis problems for various analysis systems.

Tool used (Development tools - H/w, S/w): Primer, LS Preipost, D3plot, T/HIS, Ansys Mechanical, and Hypermesh.

Objectives of the project: To learn different structural analysis softwares like Primer, LS Dyna, Hypermesh, and Ansys mechanical for the technical support.

Major learning outcomes: Learnt different structural analysis pre and post-processing software, including PRIMER, LS Dyna, Hypermesh, and Ansys Mechanical. Understood a step-by-step procedure to solve an engineering problem.

Details of papers / patents: No

Brief description of working environment, expectations from the company: Arup India Pvt Ltd provides software development and sales services to the Oasys software business. The technical support team in Arup India is dealing with consultancy projects as well as support to software like LS DYNA, Oasys Suits, etc. As an intern in the technical support team, the company

expected me to learn the Ansys Mechanical software for future support work. The working environment was very encouraging and friendly. With immense support from my mentors, the learning became more accessible and fruitful.

Academic courses relevant to the project: Finite Element Analysis, Fracture Mechanics, Theory of Elasticity and Plasticity.

PS-II Station: Atkins, Bengaluru

Faculty

Name: Mahesh K Hamirwasia

Student

Name: ARJUN SANJEEV PATIL (2020H1300080P)

Student write-up

PS-II project title: UK highway desing

Short summary of work done during PS-II: I have understood the UK design principles in terms of 1) Lane design 2) Roundabout design 3) Traffic signs 4) Understanding the workings of all the process from project conceptulisation to terminations 5) Went through essential training of softwares.

Tool used (Development tools - H/w, S/w): Auto cad, Civil-3D, Raster tool, Vehicle tracking, Naviswork management.

Objectives of the project: Learning UK highway design.

Major learning outcomes: During our internship project, I was subjected to major learning in the domain of highway design. I understood the design concepts of UK and how they are different when compared to the other countries including that of India. I used the knowledge gain by me for successfully completing multiple tasks like,

1) Compliance check 2) Area acquisition report 3) Round about design 4) Traffic sign check

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment was great. We all had a great time interning at WS Atkins. During our internship, we learnt all the essential skills and etiquettes required in the company. The team is highly collaborative at Atkins and hence up-skilling was easy. The provided resource library was overwhelming and hence learning about new softwares, understanding concepts and utilizing them was easy for us.

Academic courses relevant to the project: Highway Design.

Name: KATKAR SARANG SANJAY (2020H1300083P)

Student write-up

PS-II project title: A465 HOV

Short summary of work done during PS-II: Making alignment, Making VRS schedule, Making cross section, RRRAP report generation.

Tool used (Development tools - H/w, S/w): Civil 3D, Navis work, RRRAP.

Objectives of the project: VRS system design.

Major learning outcomes: Civil 3D, Alignment making, VRS schedule making, RRRAP.

Details of papers / patents: Not published

Brief description of working environment, expectations from the company: Working Environment is so good....Nice team, Great atmosphere.

Academic courses relevant to the project: Highway Design, Traffic Engineering.

Name: ANSHU PRAKHAR (2020H1300084P)

Student write-up

PS-II project title: Cycleway concept design

Short summary of work done during PS-II: During the PS-II, I have done design related work and checking. There are works like Site clearance, Swept path analysis, drawing checking, Concept design. In concept design, I have to design different kinds of cycleway facilities with proper tactiles, signs and markings. Also during the internship, I have worked on some project management tools like Bentley Projectwise and PAT.

Tool used (Development tools - H/w, S/w): Civil 3D, AutoCAD, Vehicle tracking, PDS line.

Objectives of the project: To check the feasibility of introducing a cycleway by designing the facilities as per design guidelines.

Major learning outcomes: Studied and understood various codes and guidelines related to highway design. Learnt to use design and management related tools and software.

Details of papers / patents: There are no papers or patents released during the PS-II.

Brief description of working environment, expectations from the company: The environment in the organisation is wonderful. People in the company help each other and there are lots of

project based works and training materials that are available for you to enhance your skills. As a beginner, this company will help you in learning and growing.

Academic courses relevant to the project: Highway design, Highway construction technology.

Name: RAKSHITH SANTHANAM (2020H1430028H)

Student write-up

PS-II project title: Design of waste water treatment plant structures and trash screen assessment

Short summary of work done during PS-II: The design of various waste water treatment plant structures were carried out. Since the location of the plant is in UK, Eurocodes had to be followed for the design of structures. Structures like Clarifiers, Tanks, Base slab, Wet well shaft, Jacking Collar were carried out according to EC 1990 and EC 1991. A special / unique design case/challenge was encountered with the design of a wet well structure. Detailed design reports were made for each structure and sent to contractor. Similarly I had assessed trash screens and screen locations based on CSOM and CIRIA 786 guidelines were carried out. The compliance of the screens with the guidelines were assessed and a detailed assessment report was made for each location.

Tool used (Development tools - H/w, S/w): ROBOT, Tekla TEDDS, Navisworks, Design excel spreadsheets.

Objectives of the project: The aim of the project was to design a waste water treatment plant initially for tender design stage and then for detailed design stage. In the tender design stage, the structures in the waste water treatment plant like tanks, chambers, clarifiers, jackin.

Major learning outcomes: 1. Bridging the gap between academic knowledge and the application aspect of it. 2. Knowledge of Eurocodes EC 1990 and EC 1991. 3. Knowledge of structural analysis and design softwares like ROBOT, TEDDS etc.

Details of papers / patents: Since I was involved in a real / live project from the start of the internship program and till the completion of the program, a research study was not carried out. A research paper couldn't be published.

Brief description of working environment, expectations from the company: My PS station was ATKINS, Bengaluru, Water & Environment division. The working environment in Atkins was very good. Although the work was challenging as I was involved in a live project from the start of the internship, the team members were very supportive and encouraging. The training sessions were planned and organized effectively. The working environment promoted collaboration, team work, communication, productivity etc. Also, the real time projects and communication with the UK team regarding the design tasks gave me a lot of exposure/insights about the work in a design consultancy firm. The mode of work was hybrid. The physical working space was also good and gave an opportunity to interact with team members more effectively thus increasing productivity and learning opportunities.

Academic courses relevant to the project: Advanced Structural Analysis, Design of Steel Structures, Advanced Foundation Engineering, Dynamics of structures, Prestressed Concrete structures.

Name: SACHIN M (2020H1430030H)

Student write-up

PS-II project title: Assessment of highway bridges

Short summary of work done during PS-II: I was part of assessment of a bridge project. I had to extract the information required for assessment like materials used in the bridge, properties and dimensions of the structural members from the as-built drawings. Then, I modelled the bridge in Midas civil software using the data extracted. In addition to this load on the bridge was calculated as per the latest codes. The model was analyzed and the results were extracted and assessment report was prepared.

Tool used (Development tools - H/w, S/w): AutoCAD, MS Excel, Midas civil, Autodesk Structural Bridge Design.

Objectives of the project: Getting a better understanding of the abnormal loading capacity of the structure and detailed analysis of cantilever slab and webs which showed substandard capacity in the previous assessment.

Major learning outcomes: - Understood the process followed in the assessment of the bridge and how assessment it is different from design.

- Modelling of the bridge in Midas civil.
- Determining the the flexural, shear and torsion capacity of the box section.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: I was working from home for first 4 months, company had provided laptop and access to softwares required for the projects. There are always people to help who has worked in the similar projects before.

Academic courses relevant to the project: Bridge Engineering, Advanced Structural Analysis, Finite Element Analysis.

Name: MISTRY VRUSHABH PRADEEP (2020H1430036H)

Student write-up

PS-II project title: Design and assessment of bridges

Short summary of work done during PS-II: During my PS-2, I started out with the fatigue assessment of 2 bridges which were at around 95% utilization. So a fatigue assessment was required to determine the further course of action for the 2 bridges. Later on, I was asked to assist in the design of an integral bridge. Here I was asked to calculate the loads acting on the structure and calculate the bending moment and shear force generated due to these loads. I was also

asked to check the capacity of the designed sections for this bridge. I also checked the whether the beams would be sufficient against lateral torsional buckling using MIDAS software. Apart from these there were many minor works where I had assisted my seniors.

Tool used (Development tools - H/w, S/w): LUSAS, MIDAS, AutoCAD, Excel, Autodesk Structural Bridge Design.

Objectives of the project: The objective of the project was to design and assess various components of a bridge such as the deck slab, abutment, piers and piles.

Major learning outcomes: The major learning outcomes were the attention to detail involved in each of the projects and how each and every design element was designed considering each and every factor such as construction stage, service stage, etc

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment is very good. Everyone is supportive and helpful.

Academic courses relevant to the project: Yes, the concepts taught were in college were applicable to the projects.

Name: TAPKIR RUSHIKESH RAMDAS (2020H1430042H)

Student write-up

PS-II project title: Assessment of highway structure bridges and culverts

Short summary of work done during PS-II: The different loading such as Dead Load, Superimposed Dead Load, Pedestrian loading, Vehicle Loading, Earth Pressure, Earth Surcharge, Special Vehicle loading and Accidental loading were studied and assessed same is done. Capacity calculation of the culvert section is also carried out with the help of CS 454. For

Wind load calculation, essential wind speed along with various correction factors such as height, fetch correction direction factors are calculated and total wind load on members are calculated.

Tool used (Development tools - H/w, S/w): LUSAS, AutoCAD, SAM, Excel, MIDAS, PowerApps, Power BI.

Objectives of the project: To Assess Highway Structures such as Bridges, Bridge components, Culverts. This structure has to be analyzed for different loading condition and has to be checked for load carrying capacity.

Major learning outcomes: Wind Load Calculation of Pedestrian Steel Footbridge, Assessment of Precast Highway Culvert, Assessment of Filler Beam.

Details of papers / patents: None

Brief description of working environment, expectations from the company: In WS Atkins, we have a free working environment; working hours are flexible. All the staff was supportive and easy to reach for query resolution. The work integrity and ethics were well maintained. The company wants us to work to our full potential with good support from the company.

Academic courses relevant to the project : Bridge Engineering, Advance Structural Analysis.

Name: SARGAM JAIN (2020H1430043H)

Student write-up

PS-II project title: Assessment of bridges

Short summary of work done during PS-II: Assessment of some bridges located in different cities in the UK is carried out as per DMRB codes. Software like AutoCAD, LUSAS, MS Excel, MS word and structural bridge design were used respectively for the purposes of modelling, analysing, calculating capacities of the sections and preparing reports.

Tool used (Development tools - H/w, S/w): Softwares- AutoCAD, LUSAS, Structural Bridge Design, MS Word, MS Excel.

Objectives of the project: The major deliverable of the present work is to learn the practical approach for the analysis and design of the structural elements from start to the end state of a proposed project and to apply the learned concepts/ theoretical knowledge to the real time.

Major learning outcomes: 1) Extraction of data from the as-built drawings
2) How to prepare AIP (Approval in principle) – Report Writing
3) Excel spreadsheet development for Assessment Calculations
4) Manual calculations of shear and bending capacity of prestressed structure using DMRB codes
5) Basics of assessment process of highway bridges
6) Manual calculations of assessment live loading (ALL model 1 & ALL model 2)
7) Modelling the bridge deck in LUSAS
8) Result extraction from LUSAS

Details of papers / patents: NA

Brief description of working environment, expectations from the company: 1) Great workplace 2) Supportive team & seniors 3) Insightful database 4) Interactive sessions & trainings 5) Appreciable work-culture.

Academic courses relevant to the project: 1) Bridge Engineering 2) Advanced Concrete Structures 3) Prestressed Concrete Structures 4) Finite Element Analysis 5) Advanced Structural Analysis 6) Dynamics of Structures

Name: NAGANAND S N (2020H1430046H)

Student write-up

PS-II project title: Design and analysis of integral structures

Short summary of work done during PS-II: In the initial period of PS-2 I was given training on basics of bridge engineering, different definitions used in practice and on Eurocodes. Later on, I was provided with the recorded videos of LUSAS to learn the usage of the same. Then I was appointed into the live project in which at first I was working on load calculation for an integral bridge such as DL, SIDL, Wind load, Impact loads, Creep and shrinkage. After this I worked on load calculation for an integral Underpass, calibration of the model and design of different structural elements of this underpass.

Tool used (Development tools - H/w, S/w): LUSAS, Autodesk structural bridge design, MS Excel.

Objectives of the project: Objective of the project is to provide detailed design and analysis of structural elements of Roe cross road bridge and Mottram Underpass.

Major learning outcomes: 1. Learnt softwares like LUSAS, Autodesk structural bridge design and Midas. 2. Understood and used Eurocodes. 3. Design of different structural elements.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Work environment here is highly structured and organized. As an intern we will be assigned with a buddy and mentor who will guide us throughout about both technical and non technical aspects of the company. Also, the company arranges many sessions for training on technical and non technical skills. Company also arranges many CSR activities such as sapling plantation drives, celebrating pride month by spreading awareness on LGBTQ+ community. The company expects us to be well versed with the basic concepts of structural engineering and strong will to learn new things.

Academic courses relevant to the project: Bridge engineering, Prestress concrete structures.

Name: KOLHARKAR ADITYA (2020H1430047H)

Student write-up

PS-II project title: Design and assessment of highway bridges

Short summary of work done during PS-II: In the span of 6 months I got opportunity to learn Euro Codes. I was also assigned for live projects. I started creating automated excel sheets for property calculations. I was also given opportunity to create FEM model in LUSAS, Truss foot bridge. I analyzed it for static and dynamic case. So as to get all the terms and conditions I again studied Euro code and analyzed according to it. Many corrections were suggested by the clients, I updated them and resubmitted them. I also worked for Viaduct, it was a challenging task, noted down all the necessary information required to create a model in MIDAS like Girder, Splice, Bracing details, their locations. Started with modelling and slowly incorporated all the required details and created a final model.

Tool used (Development tools - H/w, S/w): MIDAS, LUSAS, SAM, Auto CAD.

Objectives of the project: The main objective of this work is to understand the drawings and execute them as a model in FEM software and get the accurate results.

Major learning outcomes: I learnt how to read the drawings and collect required information and put them in the model so as to get accurate results and provide the design.

Details of papers / patents: Report of ongoing project was submitted, reviewed and approved.

Brief description of working environment, expectations from the company: The working environment is extremely good. All the people were willing ready to explain and clarify any doubts raised. If any mistakes were made knowingly or unknowingly they explained how it is to be done, and from next time hoe can that be ignored. All the seniors not only from BITS but other people were also friendly. As an intern company expects to learn the procedure that is followed so that if full time offer is given we follow the same as it is followed.

Academic courses relevant to the project: Yes, it was helpful. Few topics in Bridges really helped a lot.

Name: MULLANGI PRAVEEN KUMAR REDDY (2020H1430068P)

Student write-up

PS-II project title: Structural design of sewage & water treatment plants

Short summary of work done during PS-II: We have designed the new sewage treatment plants and also dealt with an existing one to increase its capacity.

Tool used (Development tools - H/w, S/w): ROBOT structural analysis, excel, bim 360, revit, Tekla tedds.

Objectives of the project: To make the structural design of the components involved in sewage, water treatment.

Major learning outcomes: Practical problems understanding and making changes according to prevailing situation, ROBOT software, making of automated excel sheets.

Details of papers / patents: No patents

Brief description of working environment, expectations from the company: We are expected to have sound understanding of basics and proficiency in excel and ROBOT give us extra edge over others.

Academic courses relevant to the project: Yes

Name: SHANKHA GHOSH (2020H1430065P)

Student write-up

PS-II project title: Design of foundation using Eurocode

Short summary of work done during PS-II: Mainly I worked in the water retaining structures.

Tool used (Development tools - H/w, S/w): Robot structures.

Objectives of the project: To learn robot structure analysis software and to learn eurocode.

Major learning outcomes: Exposure of Robot structure & Eurocodes.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is very good, all are helpful in nature.

Academic courses relevant to the project: Advance steel, Advance concrete structures & Earth quake engineering.

PS-II Station: Atkins, Gurugram

Faculty

Name: Mahesh K Hamirwasia

Student

Name: FARZAN A AZEEZ (2020H1430077P)

Student write-up

PS-II project title: Analysis and modelling of multi-storey buildings

Short summary of work done during PS-II: In the brief time of PS, there was a peek into various works undertaken in structural building discipline. For mastering it, as an initial phase of learning a small building has been modelled in ETABS as per ACI. Further, the quantity estimates of additional steel required in RC structural elements has been worked out. Other tasks involved performing checks in SAFE models based on geometry and loading, analysis of structural elements using ETABS, SAFE and TEDDS software as per BS Code for obtaining the capacities of the structural members, footing analysis and case studies were done. The modelling skillset was put to test on another complex multi-storeyed sample project followed by aiding in a project with rechecking and reviewing of models. All these tasks helped in the gaining knowledge in software and concepts. Finally, there was an exposure to drainage & culvert through CSOM guidelines.

Tool used (Development tools - H/w, S/w): ETABS, SAFE, TEDDS, Microsoft Excel

Objectives of the project: The major project work aimed in the outcome of gaining a practical approach to the analysis of structural elements with the application of conceptual knowledge in a new perspective. The projects undertaken for the study follows the ACI 318M-08, BS 6399 an

Major learning outcomes: The study was not limited to a single project but extended to various other tasks which was indeed significant to gain knowledge in many areas of building structures discipline.

- ☐ More insight into the modelling of structures using design software like ETABS, SAFE and TEDDS was attained.
- ☐ Limited to the design approach based on Indian Standards throughout has now been extended to ACI and BS Codes.
- ☐ Exposure to culvert and screen assessment through CSOM.
- ☐ Major deliverable of the work assigned was to learn the practical approach in application of learned concept or theoretical knowledge to real time projects.

Details of papers / patents: NONE

Brief description of working environment, expectations from the company: ATKINS as a company relies heavily on creative thinking and innovation, so work environment encourages communication and collaboration. Other words which can be used to describe the organization

are transparent, autonomous, inclusive, challenging, progressive, nurturing and utmost passionate. I strongly believe that ATKINS will uphold, follow and progress keeping the same principles and values it had been doing so for this many years, in the coming generations as well.

Academic courses relevant to the project: Design of multi-storey structures, Earthquake engineering, Advanced concrete structures, Advanced concrete technology, Advanced structural mechanics and stability, Advanced structural analysis.

PS-II Station: Avaamo, Bengaluru

Faculty

Name: Anita Ramachandran

Student

Name: ARYAN A SINGH (2018A3PS0407G)

Student write-up

PS-II project title: General improvements in Avaamo dashboard

Short summary of work done during PS-II: The work involved fixing bugs and issues in the Avaamo dashboard as well as implementing new features in the product.

Tool used (Development tools - H/w, S/w): Ruby on rails, angular js, git, gitlab, iterm2, macbook pro.

Objectives of the project: Fixing issues in the dashboard of the Avaamo product.

Major learning outcomes: Ruby on rails, angular js, git, gitlab.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The people are very helpful at Avaamo and you get to interact with a lot of teams and get involved in all aspects of software development.

Academic courses relevant to the project: DBMS, DSA.

PS-II Station: Bajaj Auto, Pune

Faculty

Name: R S Reosekar

Student

Name: GEETESH R KESHWANI (2018A4PS0327H)

Student write-up

PS-II project title: CAE and post processing methods, automation in HyperView

Short summary of work done during PS-II: Initially, it was a research project on Post processing methods and softwares and finding the one which was most suitable for our application. After selection and extensive discussion with senior team members, HyperView was decided as it also opened up the possibility of automating stress analysis through TCL language. This Next phase involved extensive coding as well as rigorous optimization of the code. The final run time of the code for a fine mesh was around 2.5 minutes, and for any component it would take much lesser

time than this. This script is really beneficial for the organisation as nearly 40engineers will use this daily. To make it more functional, instead of a single component, the script was modified to run for multiple components - an assembly and the material variability was considered as well. Area method was used for filtering the failure locations in the final iteration and it was incorporated by using hypermesh which is a part of the same HyperWorks bundle.

Tool used (Development tools - H/w, S/w): TCL/Tk, HyperView, HyperMesh, HyperWorks bundle, TWAPI, Python.

Objectives of the project: Finding the most suitable software for our application, writing a script to automate the identification of high stress spots, reporting the failure values, highlighting those locations in different images as well as one single image, inserting those image.

Major learning outcomes: Scripting, Learning TCL/Tk and various packages, understanding the capability of HyperView, HyperMesh and Scripting in general.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment was really encouraging and people were really supportive. Any doubts were explained in details and a bigger picture of the work we were doing was provided. All mentors, managers and employees were really approachable and enthusiastic in helping me out with any issue I had during work or with understanding anything.

Academic courses relevant to the project: Machine Design, Mechanics of Solids, Advanced Mechanics of Solids.

Name: JOSHI SMIT DASHRATHKUMAR (2018A4PS0516G)

Student write-up

PS-II project title: Automating and optimizing CFD analysis of intake port

Short summary of work done during PS-II: My job was to create parametric model of intake port and simulate it with the use of only open-source softwares. i also had to automate this task to do similar CFD analysis on an array of models which differ from each other by changing only one parameter.

Tool used (Development tools - H/w, S/w): CadQuery, Salome, OpenFOAM, Python.

Objectives of the project: To automate the process of CFD analysis.

Major learning outcomes: I was introduced to many open-source softwares in which I had to work. Learnt Python along the way to automate the process and understanding how to use the API fuctions of the softwares. CFD knowlegde was expected from the start.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work environment at the company is really very good and great learning opportunities.

Academic courses relevant to the project: Numerical Analysis, Fluid Mechanics.

PS-II Station: Bharat Forge Ltd., (onsite), Pune

Faculty

Name: Naga V K Jasti

Student

Name: PATIL HARSHAL SANJAYKUMAR (2020H1410092G)

Student write-up

PS-II project title: Design of combine gearbox for elevation and traverse

Short summary of work done during PS-II: The project was in to the defense department, in Artillery gun system in which we were suppose to design the combined gearbox for elevating the gun and traversing. Earlier the two different gearboxes were in use. Other projects was design of chain drive for BOD operation, design of leg (Gun Part) for a gun. etc

Tool used (Development tools - H/w, S/w): Solidworks, Ansys, Adams.

Objectives of the project: The main objective was to solve the Problem the Artillery gun is facing while its firing trial, which includes design combine gearbox for elevation and traverse, design of chain, and many small issues that was supposed to fix.

Major learning outcomes: Learnt about implementing the machine design procedure in real time project.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work culture is very cool, they will guide you well. Only the thing is timings are to be followed strictly.

Academic courses relevant to the project: FEM, SOM, Machine Design.

Name: MOHIT SHRIKANT DESHPANDE (2020H1410144P)

Student write-up

PS-II project title: Defense research and development design project

Short summary of work done during PS-II: Initially, I started with Design of Elevation and Traversing gearbox, Design of Chain Drive, Design of Locknut Tightening Tool, Design of Power Screws, Design of Worm and Worm wheel, Design of Ball screw mechanism for elevation mechanism, Design of Hypoid gearbox, Design of Timing Belt and Pulley, Design of Friction Springs, Design of Clutch Assembly and Finally the meshing of Wheel Lift Assembly.

Tool used (Development tools - H/w, S/w): Software tools - Solidworks, Hypermesh, Ansys, Adams Simulation. Hardware - Torque Wrench, spanner, Locknut Tightening Tool, etc

Objectives of the project: To help the organisation with design solution for the existing problems of a particular project and also to contribute new innovative ideas wherever possible.

Major learning outcomes: During my PS II, I learnt various design concepts like design for assembly, design for manufacturing, design for manufacturing and assembly, design for failure. I also learnt solid modeling, surface modeling, sheet metal and weldment design using Solid Works software. I learnt meshing concepts using Hypermesh software. I learnt Motion Study Simulation using Solid Works Software. I also learnt Multibody simulation using Adam's software.

Details of papers / patents: Since it's a research and development defense related project, so each and every project that I did required novel approach and innovative ideas. Currently no patent has been filed for any of the projects done by me.

Brief description of working environment, expectations from the company: Working environment was very cooperative, social and everyone always showed ready to help approach. Company expectations were discipline, punctuality and taking responsibility of your work.

Academic courses relevant to the project: Yes, all the design subjects like Machine Design, Strength of Materials, Theory of Machines, Theory of Elasticity and Plasticity, Fracture mechanics, Material Technology and Testing, Mechanical Vibrations, Micro electro mechanical systems, Product Design.

PS-II Station: Biocon, Bengaluru

Faculty

Name: Bharathi R

Student

Name: MAYURI DHOLE (2020H1010018H)

Student write-up

PS-II project title: Improvement in the settling duration of crystallization

Short summary of work done during PS-II: The project is all about reducing the settling duration of the crystallisation process. So, to deal with it DOE and OFAT were used where the parameter which has the impact will be decided. In this way the project was carried out and all the data was been captured lab scale.

Tool used (Development tools - H/w, S/w): No tools used.

Objectives of the project: The objective with this project is to reduce process time of a crystallization which will ultimately lead to improve the overall production cycle time.

Major learning outcomes: Learnt the industrial strategies and equipment.

Details of papers / patents: Not publishing any.

Brief description of working environment, expectations from the company: Working environment is very good. All are very co-operative.

Academic courses relevant to the project: Yes, it was quite evident that the equipment design subject were the utmost used.

Name: AAYUSH BELWAL (2020H1010021H)

Student write-up

PS-II project title: Monoclonal antibodies production: Cell culture and purification

Short summary of work done during PS-II: Since it was a production department and the operations inside was for the manufacturing of commercial batches so no as such major responsibility has been given just the small works like pH probes calibration and if possible then sometimes integrity testing but that to in the guidance of someone because everything executed inside the plant has to be recorded. So it was more like learning by observing rather than doing more of a practical work.

Tool used (Development tools - H/w, S/w): NA

Objectives of the project: To produce monoclonal antibody meeting quantity and quality attributes using cell culture methods in large scale for both commercial & clinical use.

Major learning outcomes: Everything mostly was a learning experience as being a chemical engineer most of the things in a pharmaceutical company is what is taught in a biotechnology courses and a bit from a chemical engineering subjects but it was overall a good learning about the monoclonal antibodies there working and most importantly there production and purification.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was very good everyone there are very supportive and encouraging. I expect company should take more UG students as well from the college apart from taking PG students only it will be a good experience for anyone who will work there.

Academic courses relevant to the project: From chemical engineering prospective Mass Transfer, Heat Transfer and somewhat Chemical Reaction Engineering can be said as relevant but i guess for Biotechnology background most of their subjects will be relevant for this project.

Name: SNIGDHA PALI (2020H1290006P)

Student write-up

PS-II project title: Cell based assays to determine the metabolic and mitogenic potency of insulin analogue

Short summary of work done during PS-II: Insulin being a potent biomolecule has been a key topic in the biological research industry for acting as an inducer for a series of metabolic and mitogenic signaling pathways in the human body. Further advancement in the biotechnological fields giving rise to recombinant DNA technology, clonal development methods, protein modification etc. led to creation of analogues of insulin which could act at varies range and less quantities. This project involves the execution and analysis of two cell based assays phosphorylation and mitogenic assay of insulin and its analogues to evaluate its efficacy and safety.

Tool used (Development tools - H/w, S/w): Biostatistics related analysis software.

Objectives of the project: To study the response of Insulin and it's signaling mechanisms through cell based biological assays.

Major learning outcomes: Learnt about cell culture as cell based assays.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Encouraging and comfortable working enviornmet.

Academic courses relevant to the project : Animal cell culture, Bio-statistics.

Name: VANSHIKA VERMA (2020H1290007H)

Student write-up

PS-II project title: Impact of different process parameters on growth characteristics of recombinant CHO cells

Short summary of work done during PS-II: For the particular engineered CHO cell line in the given study, definite parameters were studied which could potentially affect the cell viability or growth of the cells through the cell culture techniques such as passaging followed by the sampling to verify and compare the output attributes. iv The essential analysis factors were the cell count and viability, pH, glucose and lactate accumulation, osmolality, and the doubling time. The experimental procedure was designed with the help of a full factorial design model with two levels (on either side of the setpoint) for the input process parameters under study. The effect of these factors on the growth was determined by analyzing the doubling time. This would eventually help us optimize the process to enhance the product quality to the maximum. Further, the process was scaled up to the 1L bioreactor stage to infer the definitive effect of these modified inputs. It involved the design of the experiment with the help of the full factorial design model. The parameters, therefore, varied impacts growth pattern which was further analyzed to help us optimize the process for better product quality and to gain a suitable titer. These parameters were then plotted against the modified input process parameters around the reference point to estimate the range around which the growth remains undisturbed. Executed & monitored fed-batch reactor operations which involved reactor assembly and setup followed by daily sampling and analysis, feeding, and troubleshooting of the deviations observed. • Vial thaw procedures were understood and performed for this study trial. • Performed Cell banking/ Freezing of the cells. This evaluation helped optimize the input process parameters both at the shake flask stages and at the reactor stage through the understanding of the growth pattern of these cell lines under certain heterogeneous conditions. The same parameters would be monitored and kept at the optimized set points in the scale-up to higher volumes too to ensure uniformity and good product quality.

Tool used (Development tools - H/w, S/w): Fermenters, Perfusion columns, Sensor probes, Reactor pumps and controller units, Data analysis specific software, Enzymatic biosensors such as Cedex Bio, Cedex Bio HT and YSI biochemical analyzer. Others included AMBR 250, Vi-Cell counter, Osmometer, pH

Objectives of the project: To maintain the quality attributes of a therapeutic protein, the mammalian cell culture processes should be critically controlled in an orderly fashion. Therefore, the focus of this study was to design experiment cases based on the full factorial model so

Major learning outcomes: Since this process links the optimization of the input parameters from the shake flask stage to the bioreactor scale of 1L, this helps us understand the criticality of certain process factors and how the manipulation of these around the set point could affect the growth of the cells and subsequently, the product obtained from them. Furthermore, as the process generally follows the manner of scaling up to the manufacturing where higher volumes of culture are dealt with, this process optimization becomes a very significant process to secure the cost-effective operations.

1. Understanding the CHO cell line-based platform for the Monoclonal Antibody production.
2. Cell growth pattern characterization based on the regulation of the input process parameters.
3. Understanding the mammalian upstream development process for the production of biosimilars.
4. Process optimization so as to understand the feasible operating range and its integration at the scale-up level.
5. Principles and working of analysis-specific instrumentation such as Cedex Bio, Vi-Cell counter, Osmometer, pH meter and YSI biochemical analyzer.
6. Understanding the bioreactor operations and the platform process (Fed-batch, Perfusion, Short fed-batch).

Details of papers / patents: NAP

Brief description of working environment, expectations from the company: The work environment was very much inclined towards a positive side, and there was enough cooperation and support provided to me by the company. They equally trusted me with all the work and treated me with equity. They helped me incorporate my academic learnings into practical implementation where I could better understand its application. It was a safe space to contribute my input and

troubleshoot the issues faced accordingly. The values and the faith put in me made me feel more confident towards my execution of the work. I had expectations of growing and learning, and the company surely did meet the same. It helped me grow as a person because of its collaborative environment. The challenges made me extensively motivated toward the work I did.

Academic courses relevant to the project: Yes, the courses taught gave a clear concept and clarity on how the whole process works. The conceptual basis if understood would surely help for a better implementation of the same.

Name: VAREESHU KAUSHIK (2020H1290020P)

Student write-up

PS-II project title: Turnaround time reduction of critical downstream processing stages

Short summary of work done during PS-II: The main objective of the project was to reduce the turnaround time of critical process equipments. Therefore, first the critical process equipments were identified in the process. Secondly, a list of different kinds of delays and losses occurring in the equipments for a given batch was prepared. Third, overall equipment effectiveness of these equipments was calculated, then we identified the major losses and delays during the process. Different changes in the process and modifications in transfer lines were proposed to reduce such delays and losses. Study of the impact of these changes on the turnaround time of the targeted equipments / processes.

Tool used (Development tools - H/w, S/w): Mintab, JMP, RP-HPLC, CIE X, Crystallizer, Lyophiliser.

Objectives of the project: 1) Identification of areas where the critical processes are suffering different kinds of losses or delays. 2) Bring in changes in the process to reduce these losses and delays.

Major learning outcomes: Downstream processing of Insulin and its analogues. I learnt the different techniques used for separating Insulin from other proteins and process generated impurities at an industrial scale. Application of lean six sigma knowledge at an industrial level project.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment in the company was extremely student friendly. The mangagers and the other executive staff were very supportive and guided me in every step of the project. Having a background in biotechnology and chemical engineering, my reporting managers and other executives in the plant helped me understand the concepts in chemistry, biology and statistics of downstream processing, which helped me finish my project well and made my tenure in the company a fruitful one.

Academic courses relevant to the project: Pharmaceuticals, Lean Management, Lean Six Sigma, Downstream Processing.

PS-II Station: Bloomreach Technologies Pvt. Ltd., Bengaluru

Faculty

Name: Seetha Parameswaran

Student

Name: NAIK SHOUNAK SHESHADRI (2017B1A70835G)

Student write-up

PS-II project title: Image embeddings by deep unsupervised learning

Short summary of work done during PS-II: We tried a unsupervised learning technique called BYOL to build this image encoder. My work mainly revolved around experimenting with architectures, approaches, data collection, manipulation and results analysis. It was a very rewarding experience because I am not confident about building and analyzing models independently.

Tool used (Development tools - H/w, S/w): Python, Pytorch, Torchvision

Objectives of the project: The objective of the project was to build an image encoder that will give robust representations of the images such that they can also be clustered together.

Major learning outcomes: I learnt to develop models in an iterative manner which is seen in any deep learning model development. I learnt soft skills about presenting my work in the right way and to ask doubts efficiently. I significantly upskilled about Computer Vision and Python development.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Two mentors guided me and let me have my own freedom to explore my ideas and approaches. They expected results during the weekly meetings and encourages discussion about my ideas and approaches. I received plenty of guidance whenever I was stuck too.

Academic courses relevant to the project: Deep Learning, Neural Network Fuzzy Logic, Machine Learning.

PS-II Station: Bright Champs – Non-Tech, Bengaluru

Faculty

Name: Anjani Srikanth Koka

Student

Name: AAYUSH MALIK (2017B4A21559H)

Student write-up

PS-II project title: Product management and content distribution strategies

Short summary of work done during PS-II: Initially worked on creating a creating a sample app using no code websites for A/B testing. Then focused on marketing mainly email marketing. Later worked as an search engine optimization expert to create backlinks for existing blogs.

Tool used (Development tools - H/w, S/w): Google sheets, Google Docs, Oreoops, Figma, Ahref.

Objectives of the project: Product Management, Email Marketing, Search Engine Optimization.

Major learning outcomes: Product management and search engine optimization focusing on Backlinks.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Work environment was good, as the employees were given a choice to either work remotely or from office which allowed for easy transition into the company. The management was supportive and you were given liberty to explore how you want to approach a problem.

Academic courses relevant to the project: Business communication.

PS-II Station: Bright Champs - Tech, Bengaluru

Faculty

Name: Monali Tushar Mavani

Student

Name: PARTH BATRA (2017B4A40871P)

Student write-up

PS-II project title: Lead quality generation and churn prediction

Short summary of work done during PS-II: To assign lead quality score for collected leads and setting up priority scores. To predict when will a customer start becoming inactive and eventually churn out and what measures can we take to improve the situation.

Tool used (Development tools - H/w, S/w): Python, Pandas, Scikit-learn, Numpy, lifelines, R, MySQL, DataGrip.

Objectives of the project: Measure quality of lead generation for effective lead generation and predict inactivity and churn prediction.

Major learning outcomes: Data Cleaning, Data Modelling, EDA, Survival Analysis, SQL, Data Pipelining.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is very friendly. All employees are very helpful and supportive when you get stuck somewhere. Arun Sir (CTO) is also very approachable and gives you good advice on projects. All the resources that you need for the project will be provided to you in no time you can go on with the project without any hinderance. Manager was also very friendly, knowledgeable and helpful; helped me very much during my stay there. You would have to take responsibility for delivery of the project with regular updates and you will learn a lot.

Academic courses relevant to the project: Probability and statistics, Applied statistical process.

PS-II Station: Bundl Technologies Pvt. Ltd., (Swiggy) - Tech, Bengaluru

Faculty

Name: Srinivas Kota

Student

Name: B SIVARAAMAN (2017B2A81314H)

Student write-up

PS-II project title: Vendor portal and development

Short summary of work done during PS-II: I have contributed to Vendor System as a full stack dev, as I have learnt new languages and frameworks, which are part of Vendor Space. Also implemented those learnings into Frontend project: Web Continuous Ringer and CMS migration, and Backend: CMS Migration.

Tool used (Development tools - H/w, S/w): Vendor Systems, JavaScript, AngularJS Postman, API React +, TypeScript SCSS, GoLang, GraphQL.

Objectives of the project: Work on vendor Portal and Create Internal dashboards.

Major learning outcomes: Full Stack Web Development.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Amazing Work environment and very good learning exposure.

Academic courses relevant to the project: OOPS.

Name: KANISHK PATHAK (2018A7PS0176H)

Student write-up

PS-II project title: Product management

Short summary of work done during PS-II: Ideated, Hypothesized, Validated and executed the overall vision for key products which may end up shaping the new age convenience industry of India.

Tool used (Development tools - H/w, S/w): Miro, Figma, Docs, Postman, PowerBI, Vysor (UAT) etc.

Objectives of the project: Collaborate with Swiggy to research and create cutting-edge consumer products.

Major learning outcomes: 1. Product Roadmap 2. User Experience 3. PRD Creation 4. PRFAQ Creation 5. Product Vision 6. Stakeholder Management.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is very exciting, innovation-driven and conducive for freshers. Learning is promoted, teams are respectful and are willing to help you grow personally and professionally. Expectation are simple, turn for work with a can do attitude and a passion for creating great products.

Academic courses relevant to the project: NA

Name: DEBMEET BANERJEE (2018A7PS0385H)

Student write-up

PS-II project title: Multiple - Swiggy Instamart team projects

Short summary of work done during PS-II: Worked in the Swiggy Instamart team. My work was backend related. Mainly Java and Spring boot while some othe services were written in golang. Postman and BloomRPC was used regularly while development. Mentors and Mangers helped me to release my first production deployment. Writing tech docs was also a big part of the internship. The tech docs contan problem statement and various solution approaches with their pros and cons. First tech doc is approved and then coding begins.

Tool used (Development tools - H/w, S/w): Java, Golang, Sprint Boot, BloomRPC, Postman.

Objectives of the project: Multipe Projects - many objectives.

Major learning outcomes: Increased familiarity with SDLC. Team interaction, interaction with manger. Agile methodology followed with daily standup. Java, Golang for development. Understood how testing and deployment works. Also released code in production which is actually getting used by users right now.

Details of papers / patents : NA

Brief description of working environment, expectations from the company: Good working environment, standard working hours, Sat/Sun off. All Engineers get a Mac-book for development. All team members can be approached for any doubt, they redirect to the correct POC. Sufficient time is given for completion of projects.

Academic courses relevant to the project : OOPS and DBMS to some extent.

PS-II Station: Capital Float, Bengaluru

Faculty

Name: Anjani Srikanth Koka

Student

Name: SANJAY SAROV JOSHY (2020H1490808P)

Student write-up

PS-II project title: Credit risk analysis of personal loan X-sell

Short summary of work done during PS-II: The major tasks involved were Implementation checks of the Credit Policy, Line computation, ATS expansion, Introduction of the Telecollections line, and Performance Analysis of Amazon Pay Later customers post Personal Loan disbursal. Various BAU tasks were also performed daily, involving liaising between Sales, Product, Technical, and Collections.

Tool used (Development tools - H/w, S/w): Microsoft Excel, SQL, Power Point.

Objectives of the project: To perform the Credit Risk Analysis of the Personal Loan product which is cross-sold to the Buy Now, Pay Later customers of the company.

Major learning outcomes: Granular Level Understanding of the FinTech industry, Expertise in Digital lending and Credit Underwriting process.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: A small team with a very friendly environment. The work culture is relaxed and everyone has a helpful mindset.

Academic courses relevant to the project: Financial Risk Analysis and Management.

PS-II Station: CEG Ltd., Jaipur

Faculty

Name: Samata Satish Mujumdar

Student

Name: G KRISHNA DATTA ADITYA (2020H1300063H)

Student write-up

PS-II project title: Design & analysis highway geometrics

Short summary of work done during PS-II: Different project documents like land acquisition & clearances, detailed project report, technical schedules, and Study of IRC Codes (38, 73, 67, SP - 23, 73, 84, 41). Checklists for Horizontal and vertical geometrics, Drainage, Traffic Signages

were prepared. Drainage design for Munger - Mirzachawki Project was designed. Plan & Profile for Dungarpur - Sagwara section, Unnao - Lalgunj section, Chakeri - Allahabad section, Bikaner – Phalodi section were checked as per code references. Checking of Signages & Offset report for those sections were prepared. Road safety assessment report for Himachal Pradesh section consisting four corridors (Palampur – Sheela chowk, Bhuntar – Kullu, Nalagarh, Tahilwal – Naya Nangal) was prepared. Design of Sanchore section from 2 lane to 4 lane was designed using Civil 3D software.

Tool used (Development tools - H/w, S/w): Civil 3D, MS Excel, Google earth.

Objectives of the project: 1. To understand the various design standards and codes used for project. 2. To get exposure to the real time project implementation. 3. Enhance the knowledge about various reports prepared before execution of project. 4. Improve relevant skills.

Major learning outcomes: Got familiar with various IRC codes and project constraints.

Learnt civil 3D software, drainage design (IRC SP 42), identification of traffic signs.

Understood procedure of geometric design and road safety audit.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Workflow in the company, working environment is good and learnt many new things.

Academic courses relevant to the project: Highway Geometric Design & Traffic System Analysis.

PS-II Station: Central Road Research Institute, New Delhi

Faculty

Name: Mahesh K Hamirwasia

Student

Name: KARRI ABHI RAM (2018A2PS0200H)

Student write-up

PS-II project title: Agriculture based transportation planning using QGIS

Short summary of work done during PS-II: I identified the best possible routes for the local farmers to transport their harvest from agriculture lands to block head quarters and district head quarters of state Meghalaya by carrying out the routing analysis in QGIS. And I learned about of application of QGIS in transportation field.

Tool used (Development tools - H/w, S/w): QUANTUM GIS, GOOGLE EARTH PRO.

Objectives of the project: The main objective in our project is to identify routes using QGIS for agriculture-based transportation in Meghalaya. It basically means identification of the agricultural lands, establishment of their centroids and creating a grid of around a kilometer.

Major learning outcomes: Road network efficiency and travel time reduction.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very good working environment with proper guidance.

Academic courses relevant to the project: No

PS-II Station: Cisco Systems (India) Pvt. Ltd., - Software Engineering, Bengaluru

Faculty

Name: Raja Vadhana P

Student

Name: SHAH BHAVYA AMIT (2017B4A71022G)

Student write-up

PS-II project title: Log4j Migration -1.x to 2.x

Short summary of work done during PS-II: Resolved compilation issues related to log4j version upgrade, resolved test case failures, tested upgraded product on virtual machines.

Tool used (Development tools - H/w, S/w): IntelliJ, Eclipse.

Objectives of the project: Upgrade CVP code base from log4j 1.x to 2x version.

Major learning outcomes: OOP, Java.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was good. People are helpful.

Academic courses relevant to the project: OOP, DSA.



Name: PARMESH KUMAR MATHUR (2018A7PS0133G)

Student write-up

PS-II project title: Packet tracing with eBPF

Short summary of work done during PS-II: The work done revolved around tracing the kernel performance and packets. Operating systems have conventionally 'netfilter' to track or take action on packets in the systems, and are moving 'eBPF' slowly. A major part of the work involved researching and investigating the potential of this tool and to what extent it can be used. The latter half of the internship was mostly coding and debugging to trace packets using eBPF, all this while keeping the coding of the rest of the code base in mind (with respect to language, modules used etc.).

Tool used (Development tools - H/w, S/w): VMware Fusion, Git, GitHub, WireShark, Sublime, WebEx.

Objectives of the project: To trace incoming and outgoing packets ,their individual metadata and cumulative data from a system. To use the collected information to observe patterns and increase network security.

Major learning outcomes: Network layers, Network security, Kernel stack, Kernel probing
System performance tracing.

Details of papers / patents: No papers or patents published

Brief description of working environment, expectations from the company: Cisco is really one of the best places to work in. The people are great, both my manager and mentor were always there to help when I needed it. The internship program as a whole is very fulfilling. I never felt overworked despite the amount of work done. People generally hear about the great work culture and work life balance and expect quite a lot from Cisco, and Cisco stands up to those expectations.

Academic courses relevant to the project: Operating Systems, Computer Networks, Data Structures.

Name: MEGH K PATEL (2018A7PS0148G)

Student write-up

PS-II project title: Code optimisation, microservice development and process debugging for network security

Short summary of work done during PS-II: 1. Improved efficiency of codebase 2. Created a new encryption service which can be used to provide extensive security 3. Created a process debugging tool to help identify bugs and other irregularities in client machines.

Tool used (Development tools - H/w, S/w): RHEL-8, git, ssh/scp, python, java, REST api, spring boot, docker, unix sockets, unix pipes, signals, makefile.

Objectives of the project: 1. Porting existing code to another python library to improve efficiency; 2. Converting an existing program into a microservice that would provide encryption service using REST api endpoints; 3. Creating a debugging tool that can profile java processes.

Major learning outcomes: I've learnt many new things and gained valuable corporate experience to excel in my career. I've learned about the TPM chip, cryptography, remote shell access and file transfers, unit testing, microservices, REST APIs, docker, advanced Python libraries, rpm packages, IPC methods as well as about Cisco's ISE.

I've also picked up many soft skills like effective teamwork, public speaking, clear communication through emails as well as in face-to-face meetings, logical thinking and finally solving problems by dividing a hard task into smaller chunks that can be easily solved.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was very conducive to productivity. Everyone in the company is treated equally and every idea is heard. My team and manager were very helpful and always guided me along the way. Overall it was a very excellent experience.

Academic courses relevant to the project: Computer Networking, Operating Systems.

Name: SHAH MEET KETAN (2018A7PS0158G)

Student write-up

PS-II project title: P3 migration of vtest framework

Short summary of work done during PS-II: Qualifued 30 suites by ensuring proper functioning, solved their errors by fixing around 20 bugs and raising those many prs.

Tool used (Development tools - H/w, S/w): vtest, sdwan, vscode, tmux, various python libraries.

Objectives of the project: Convert the huge codebase of vtest framework from pyhton 2 to python 3 ensuring no unpredictable or improper functionality.

Major learning outcomes: Dealing with huge codebase, debugging and programming skills enhanced, documentation.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Very good working environment, good support and team work, help for going at your own pace and many events.

Academic courses relevant to the project: oop, toc, popl, networking, bash from c programming.

Name: KARTIK KUMAR (2018A7PS0165G)

Student write-up

PS-II project title: Static application security testing

Short summary of work done during PS-II: The major work done during the course of the practice school was in the domain of network security. The major issue with current code which is widely used in Cisco products is the amount of vulnerabilities present in the code which arises through common but not secure coding practices. Thus the main objective of the project was to perform static analysis of code which is being committed to the codebase. The SA was performed using ASTs. The SA tool developed was able to identify 9 high priority vulnerabilities in the C code as well give secure coding suggestions. The other work included research on using compiler options for static analysis. The compilers like GCC and Clang have been working on SA tools for C. I had to analyze the prospect of using these compiler options. I also worked on consent token MFA using TAM (Trust Anchor Module) for Secure Shell Access Management System, Secure Development Key Management, Authenticated Variable Management and Secure Product Access Management.

Tool used (Development tools - H/w, S/w): Python, C, TAM

Objectives of the project: 1. Improve security of code that is being committed to the codebase. (This tool is specifically designed for the C code that is used in Cisco's NX-OS etc.) 2. Raise warnings for any security vulnerability that is found in the code that is being committed.

Major learning outcomes: The major learning outcomes include gaining knowledge about various security vulnerabilities present in the code, how to detect it using ASTs and provide secure coding suggestions to the developer and how latest versions of compilers like Clang and GCC provide compiler options that provide the developer with basic static analysis. Also I learnt about Consent Token MFA which Cisco achieves using TAM chips.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment of the company was very professional. The communication among the team members was made very simple and efficient through Cisco Webex. The manager was very professional and held regular meetings. The work and deadlines were made very clear and all the doubts were entertained by either the manager or my mentor both of whom were always available. Overall, the people were very professional and helpful and made a comfortable environment for interns like myself.

Academic courses relevant to the project: Computer Networks, C Programming, Operating Systems.

Name: ANIRUDH NAGARAJ (2018A7PS0216G)

Student write-up

PS-II project title: Automation and testing using mks test framework

Short summary of work done during PS-II: The project involves building automation and test cases around features developed as part of MKS – Maglev Kubernetes System. Maglev is the Platform for applications built for DNAC - Digital Network Architecture Center, which is a powerful network controller and management dashboard and allows for network monitoring, network analytics and enhances network security.

Tool used (Development tools - H/w, S/w): Kubernetes, Python, Containers, Helm, Networking, Shell, Linux.

Objectives of the project: The aim of the project is to develop automation and test cases for features developed as part of MKS, which will allow for better bug detection and higher product release quality.

Major learning outcomes: Automation-based testing, Platform-as-a-Service, Kubernetes, Python, Containers, Helm, Networking, Shell, Linux.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Good working environment, and flexible working hours. Complete tasks as assigned by manager/mentor(s).

Academic courses relevant to the project: OOP, OS, CP, CN.

Name: MANIKANDAN GUNASEELAN (2018AAPS0246G)

Student write-up

PS-II project title: Automation-based testcase design and monitoring for Cisco IOS XR routers using CAFY

Short summary of work done during PS-II: Automated five testcases regarding NETCONF protocol - part of the netconf and AAA automation packages, Helped team in migration of its traffic generator from Spirent to IXIA, Ops work including Git issues and failure analysis of runs submitted on CAFY.

Tool used (Development tools - H/w, S/w): Python, pytest, git, GitHub, Cisco IOS XR, Router families - NCS5500, ASR9k, N540.

Objectives of the project: Automation of testcases in Automation packaged, designed for exercising features of Cisco IOS XR, which is Cisco's operating system for its service provider routers.

Major learning outcomes: Understanding the codebase of the organization and contributing to the automation packages maintained by the team.

Familiarity with the tech stack - python, pytest, git and Github, Cisco IOS XR.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: I was part of the Manageability team and the LPTS-AAA team, both in MIG group of Cisco. My coworkers and managers were very helpful throughout the internship and guided me whenever I was stuck. The networking knowledge required for this project was high and they helped me to acquire the same. The tasks I was assigned grew in difficulty as I ramped up and provided ample learning opportunities throughout the internship to get familiar with the automation packages, tech stack and the code base of the organization.

Academic courses relevant to the project: Communication Networks, Computer Programming.

Name: VANGAVETI YASHWANTH (2020H1030129H)

Student write-up

PS-II project title: Migrating the SSH tasks to restful API for hyperflex

Short summary of work done during PS-II: I learnt esxcli software command and learnt performing the copying, installing, updating and removing the vib files manually. Later written code in python for invoking the available api and able to perform the tasks. Later learnt ansible and written the code for automating the tasks dynamically. As final step, integrated written code with the main codebase on bitbucket.

Tool used (Development tools - H/w, S/w): ESXi hosts and Vcenter Server, Ansible, Git, Bitbucket, Restful APIs, Python and Pyvmomi.

Objectives of the project: The SSH tasks should be replaced by API which helps in performing the tasks in more secure way.

Major learning outcomes: Learnt many technologies like ansible, python, bitbucket etc. I learnt how software teams work and got a gist about how things go in corporate way and got great practical experience with the technologies I learnt.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is really great and the manager, team leader and mentor helped me a lot with every doubt i got and made very comfortable in the team. They helped me in understanding the project and explained things in very easily understandable way. The expectations from me is to complete the tasks in given time which i am able to do and all the tasks are also given by sufficient time.

Academic courses relevant to the project: Cloud Computing, Python, Rest Apis.

Name: THAOKAR ADITYA MUKUND (2020H1030132P)

Student write-up

PS-II project title: CX cloud agent

Short summary of work done during PS-II: Work was mostly focused on the security and automation part. Automated the secret scanning process on git and bitbucket links based on scanning tools . Later developed a sensitive information finding framework for AWS log groups which has features like generating and emailing the reports. Worked on security compliance tools for gathering the vulnerabilities in cloud agent images and patches.

Tool used (Development tools - H/w, S/w): AWS services, Vulnerability scanning tools, Postman, Kubernetes, Python.

Objectives of the project: CX Cloud Agent is on-premise software platform that allows to host lightweight containerized microservice capabilities. CX Cloud Agent expedites the monetization of new offers, scales existing capabilities, and helps to develop next-generation services.

Major learning outcomes: Learnt about AWS services, how automation works, kubernetes, security compliance.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Cisco ranked 1 in 2022 Top 10 Best Companies to Work For. The working environment here is very good. There are so many learning opportunities to build up the skills. Mentor and manager were very helpful and friendly. Their guidance helped me to work on correct path towards achieving the tasks. Expectation from company is that you should always be eager to learn and adapt the knowledge, learnings.

Academic courses relevant to the project: Advanced Computer Networks, Cloud Computing.

Name: ABHIGYAN BORAH (2020H1120288P)

Student write-up

PS-II project title: Optimal software version recommendation system

Short summary of work done during PS-II: Fixed a back-end bug related to sorting of recommendations, analyzed the root cause of a bug related to software release notes being unavailable, refactored and cleaned code related to project as part of data and service migration within Cisco, created an AWS Lambda function to migrate data between AWS S3 object storage buckets, created test cases for AWS Lambda functions, integrated an API gateway, modified a REST APIs response schema.

Tool used (Development tools - H/w, S/w): Java, Maven, Springboot, Python 3, Amazon Web Services, Kubernetes, Github, CircleCI, Sonarqube, Jira Software, Cisco Webex.

Objectives of the project: To implement a system within Cisco Cloud to recommend the best software version for Cisco devices owned by customers and partners, based on their requirements, to add to their business success.

Major learning outcomes: Applied the knowledge of Agile software development practices learned in the academic course Software Engineering and Management, learned about CI/CD while getting hands-on experience deploying services, learned about unit testing while writing test cases for service, learned about Cloud Architecture while also applying the concepts learned in the academic course Cloud Computing during development of certain parts of the project.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment consisted of an agile team of about 10 software engineers. Work was carried out in sprints of two weeks. Prior to the start of sprints, sprint planning and retro sessions were conducted (separately). During sprint planning, user stories and sub tasks were assigned to each engineer based on experience and domain knowledge. Each engineer had to report what was done, what is being done, and if there had been any blockers while working on an assigned user story or task. Overall, the work was not hectic at all and my manager and technical leads treated me very well. I was never burdened with tasks nor I was given a task that was too technically challenging for me. The work quality and work-life balance has been incredible.

Academic courses relevant to the project: Cloud Computing, Object Oriented Analysis and Design, Software Engineering and Management.

Name: SOUMYADEEP BOSE (2020H1240099P)

Student write-up

PS-II project title: Adoption dashboard development using Grafana, React.Js and PowerBI

Short summary of work done during PS-II: Adoption dashboard creation using dynamic data pushed via Kafka and improvising on the UI framework.

Tool used (Development tools - H/w, S/w): Grafana, ElasticSearch, React.js, PowerBI, Chart.js, Python 3.7, Github, Docker, Javascript, ES6, ES7, HTML, JSON, Visual Studio Code, Cisco Webex.

Objectives of the project: 1) Connecting ElasticSearch database to Grafana, React.js and PowerBI. 2) Reflecting Adoption Dashboard through customization of charts and panels. 3) Hosting the applications in Cisco verified localhost or server.

Major learning outcomes: 1. Learnt how to populate the database and push data from the backend.

2. Learnt to work in Grafana using ElasticSearch database.

3. Learnt how to create UI frameworks and easy to use dashboards using React.js

4. Learnt to work with PowerBI features to create interactive dashboards.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The entire working environment was encouraging. Manager and mentors were always there to help whenever needed. Has been a wonderful experience through Fun Fridays, Wordle, mental welfare, Workout and several other events. Really a nice place to work.

Academic courses relevant to the project: Computer Networking, Operating Systems, Python.

PS-II Station: Cisco Systems (India) Pvt. Ltd., - Hardware, Bengaluru

Faculty

Name: Suparna Chakraborty

Student

Name: SUKRITI MISHRA (2017B3AA0804G)

Student write-up

PS-II project title: Asic verification

Short summary of work done during PS-II: was mainly involved in Asic Verification. I learnt about test bench generation and developing test cases to check the corner cases. Test environment was created in UVM. Synopsys compiler was used to view waveforms and find bugs in the design.

Tool used (Development tools - H/w, S/w): System verilog, UVM, synopsys compiler.

Objectives of the project: To develop verification environment for asic.

Major learning outcomes: Asic verification.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Company provided laptop and all work was done online. Mentor and manager both were very helpful and gave time to understand new concepts.

Academic courses relevant to the project: Digital Design.

PS-II Station: Citrix, Bengaluru

Faculty

Name: Febin A Vahab

Student

Name: VISHAL JOHN VARGHESE (2020H1030134P)

Student write-up

PS-II project title: Citrix Application Delivery and Security: Entity Centric Configuration Model

Short summary of work done during PS-II: The initial phase of my PS revolved around understanding the Citrix products involved in my project. Once the basics were clear I had to understand the codebase and the data flow in the code level. In order to achieve the proficiency in understanding the terminologies and configurations I had to test various workflows in the application interface. Once I got to understand the work flow, few tasks were assigned to me. Those tasks included user interface development in ReactJS framework and some backend related work which involves python. I got to learn a lot more while working on these tasks. As I was able to do my work at a good pace, I got assigned more tickets every 2 weeks. I was able to complete max tasks as possible including new features, bugs, testing and debugging etc. Also I got to attend all the meetings and discussions which helped me understand the ultimate aim of the project and the importance of the work being done. These meetings and discussions helped me to develop my communication and presentation skills.

Tool used (Development tools - H/w, S/w): ReactJS, Python, JavaScript, FreeBSD OS, Emacs editor, Vi editor, HTML, CSS.

Objectives of the project: To attain the automation of a workflow in the conversion of one of the Citrix products to cloud.

Major learning outcomes: Learnt new technologies including JavaScript, Python, ReactJS etc. Also got to learn the corporate work culture and the agile methodologies being followed in the industry.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Citrix offers a very vibrant and employee friendly work culture. They gradually develop the skills within us and slowly increases the pace of learning. The whole team is very helpful as you can approach them anytime with anything, they are always there to help. Every intern is assigned a manager, a mentor and some guides as well depending on the team. Regardless the position everyone is ready to help in all the situations. They do expect the interns to complete the work assigned to them. Even if you find it difficult to achieve the target you can always contact your manager or mentor and seek help from. Usually this doesn't happen since they don't put too much pressure on the employees as work life balance is very important in Citrix.

Academic courses relevant to the project: Yes. Mostly the object oriented concepts, algorithms, design etc were very helpful in my case.

PS-II Station: Clarivate Analytics, Bengaluru

Faculty

Name: Bharathi R

Student

Name: V ANUHYA (2020H1080317P)

Student write-up

PS-II project title: Company and drug insights, a focused, driven project, based on developing top-end disease landscape and forecast reports for multiple indications and therapy areas

Short summary of work done during PS-II: Clarivate has providing a great opportunity to work on the live-projects and understand the real world data to develop the high-end syndicated drug landscape reports. I have been a part of fe syndicated projects such as, KOL identification, Patent research and, Biosimilar pipeline update. The information generated from these projects was useful in analyzing the market dynamics for a desired indication. These reports also help the clients to assess the current market trends, understand the unmet need in the market, create a strong positioning for their drugs in pipeline and many more.

Tool used (Development tools - H/w, S/w): Excel, Secondary resources.

Objectives of the project: The main objective of the bio-pharma insights team is to develop syndicated biosimilar and generic disease landscape and forecast reports, which involves conducting secondary research through various paid and freely available data sources and collecting them.

Major learning outcomes: Biopharma insights team designs and validates high-end syndicated reports which helps the clients to understand the positioning of the drugs and anticipate new products coming into the market. These reports are the Drug Landscape and Forecast reports which contains all the information for the desired indication helping the clients to optimize their disease and marketing strategy. The importance of market assessment and how it can help us understand the dynamics of the market, where the drugs are positioned in the treatment journey, where to find untapped business opportunities, anticipate the new products coming into the market and their expected impact, comprehend the drivers and constraints in the market and, identify the unmet needs.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Great learning experience, good work culture.

Academic courses relevant to the project: MS excel course, Clinical research course, Quality assurance and regulatory affairs.

Name: URVASHI ANWEKAR (2020H1460358P)

Student write-up

PS-II project title: Global market access, pricing and reimbursement

Short summary of work done during PS-II: Have to go through HTA documentation of various country to produce review on context matter platform which gets published for clients access.

Tool used (Development tools - H/w, S/w): No

Objectives of the project: To produce a consistent, minimum error reviews for clients using HTA documents of various countries.

Major learning outcomes: Secondary market research.

Details of papers / patents: No

Brief description of working environment, expectations from the company: Working environment is amazing. Very helpful people and good learning as intern.

Academic courses relevant to the project: Pharmaceutical drug knowledge.

Name: SANSKRUTI SANTOSH KHARAVTEKAR (2020H1530363P)

Student write-up

PS-II project title: Company and drug insights, a focused, driven project based on developing top-down forecasts models for multiple indications and therapy areas

Short summary of work done during PS-II: Received trainings of pricing, patent research, KOL identification, Pipeline Pull, Forecasting and company & drug insights product. Built topdown forecast models, based on various information available through internal and external sources.

Tool used (Development tools - H/w, S/w): PVP, Cortellis, Market Analyzer, Analogue Research Tool, Cortellis Generic Intelligence.

Objectives of the project: To develop top down forecast models for multiple indication and Therapy Areas which is a part of Understanding Business Portfolio, based on conducted secondary research and sales reported by companies and considering various other events.

Major learning outcomes: Forecasting Basics, Trend analysis, Event Impacts, Patent Research, Understanding Cortellis.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Entire friendly and helpful work culture, the mentors assigned are totally helpful, gives a wide exposure even to interns, provides an environment where you can gain more knowledge and skills to turn into a professional from a fresher.

Academic courses relevant to the project: Clinical Research, Advanced Pharmacology, IPR, QARA.

PS-II Station: CleverTap Pvt, Ltd., Mumbai

Faculty

Name: K Venkatasubramanian

Student

Name: CHOKHANI NAMAN RAVI (2017B3A70726P)

Student write-up

PS-II project title: Software development for the CleverTap platform

Short summary of work done during PS-II: The major project involved building an entire platform to enable sending prior advance notices to clients regarding platform downtimes. This involved all aspects involved in building the end-to-end platform. Apart from this work revolved around some core platform components, adding features and optimising existing features.

Tool used (Development tools - H/w, S/w): Java, MongoDB, Retool.

Objectives of the project: Add new features, optimise existing features to the core platform. Build an automated infrastructure for sending downtime notifications to clients.

Major learning outcomes: How to design and develop software at scale.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment is good along with the culture. The expectations are equally high as interns are as well placed on real projects.

Academic courses relevant to the project: Database Design, Object Oriented Programming, Computer Programming.



PS-II Station: Cohesity Storage Solutions India Pvt. Ltd., Bengaluru

Faculty

Name: Jyotsana Grover

Student

Name: SHREYA MALLAMPALLI (2017B4A70313G)

Student write-up

PS-II project title: Multiple framework

Short summary of work done during PS-II: Worked on two major services - the integration of legacy automation service with the current framework. These were the python based Robot framework and the go based ginkgo framework. The second was the support service that is used by the internal customers, the support engineers, for ease of dealing with issues in customer cluster and other dmaas customer facing services. The features here involved UI and backend development.

Tool used (Development tools - H/w, S/w): Angular, JavaScript, Java, Node JS, Sails JS, python, golang, Robot framework, Ginkgo framework.

Objectives of the project: Automation framework integration and new features additions in the ui and alerting framework.

Major learning outcomes: Full stack development, automation and testing, life cycle of a Saas service, end to end development and deployment, syncing with multiple teams and working on bugs and field issues.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very helpful team members, guided me with anything I needed. I was expected to deliver the features I was working on, and deal with any bugs etc that were present in my code, and make sure that the feature was customer ready.

Academic courses relevant to the project: Computer Networks, Network Programming.

Name: SPARSH KASANA (2018A7PS0247P)

Student write-up

PS-II project title: Cohesity AWS features

Short summary of work done during PS-II: Writing tests for automated testing of the UI of a newly developed feature, unit tests for the new feature and implementing a feature to backup and recover ENIs when recovering AWS EC2 instances.

Tool used (Development tools - H/w, S/w): AWS, Go Lang, C++, Git, Postman.

Objectives of the project: UI test automation and ENI recovery.

Major learning outcomes: Software development, writing scalable code, communication skills.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: My onboarding process was quite smooth thanks to the management. The projects allotted to me were quite interesting and relevant to the upcoming services of the company. My mentor was very helpful and involved, and my colleagues were also very approachable and friendly.

Academic courses relevant to the project: Computer Networks, Network Programming.

PS-II Station: CommerceIQ, Bengaluru

Faculty

Name: T Venkateswara Rao

Student

Name: SUCHISATTAM SARAN (2017B2A70585P)

Student write-up

PS-II project title: Market intelligence team

Short summary of work done during PS-II: I automated a process which was currently being done manually using RPA i.e. Robotic Process Automation (Selenium). Along side with developing on the above i also handled my on call duties and did bugfixes/modifications in the team's services whenever required.

Tool used (Development tools - H/w, S/w): Java, Selenium, Sonar Cloud, New Relic.

Objectives of the project: Design a process to automate current manual process.

Major learning outcomes: Handling real time load and overcome bugs and errors faced, Fixing bugs encountered in team's services.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is pretty good. All the colleagues are friendly and helpful. I have enjoyed working

here alot. We had freedom in timings we wanted to work, the deliverables expected from us were informed to us in advance.

Academic courses relevant to the project: Yes

PS-II Station: Confluent India Pvt. Ltd., Bengaluru

Faculty

Name: Pravin Yashwant Pawar

Student

Name: RUCHI BATRA (2017B3A70629P)

Student write-up

PS-II project title: Customer workflow development framework

Short summary of work done during PS-II: Built 4-5 microservices that would all be integrated to support the basic infrastructure. Docker is used to containerize all the microservices. Kubernetes is used to create pods and nodes to bring up the services. Later they will be hosted using helm chart which will help to bring up the infrastructure on any environment.

Tool used (Development tools - H/w, S/w): Github VS code, Pycharm Pypi packages, Python, FastAPI Uvicorn, Swagger UI, Jfrog Artifactory, Pytest, Tocs Flake8 Kubernetes, Docker, Docker Hub, Confluent Cloud, Confluent CLI.

Objectives of the project: To automate the testing of the major two products of confluent - Confluent Platform and Confluent Cloud. The exact workflows of all the customer will be replicated to enhance the quality of the products. This infra can be bring up to any machine or cloud.

Major learning outcomes: End to end development and testing of the tool.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good worklife balance. No major load from the team. Good learning experience. They would give you the learning material first before giving you the actual project.

Academic courses relevant to the project: OOP and competitive programming.

Name: SIDDHI MAHESH BURSE (2017B3A70972H)

Student write-up

PS-II project title: Develop a Kafka sink connector which ingests metrics into an external system from Kafka

Short summary of work done during PS-II: Developed a sink connector from scratch which pushes metrics from kafka topics to an external metrics system. Wrote unit & integration tests for the connector. Performed performance benchmarking for the developed connector. Deployed connector in confluent cloud. Development done in Java.

Tool used (Development tools - H/w, S/w): IntelliJ, Docker, Kubernetes, Maven, Apache Kafka, Confluent Platform, Confluent Cloud.

Objectives of the project: 1. Develop a running connector which reads messages from Kafka topics and posts them to the external metrics system. 2) Implement unit & integration tests for the connector. 3) Check the performance of the connector. 4) Deploy the connector to confluent c

Major learning outcomes: 1. Learnt about Apache Kafka 2. Learnt about Confluent Connect framework and connectors 3. Learnt about cloud-native development

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Confluent is a fast growing, fast-paced company. The team members are helpful but the overall expectation is that one should be able to perform the given task with minimal help / guidance.

Academic courses relevant to the project: Object oriented programming, Computer Networks.

Name: JINIT SHAH (2018A7PS0188G)

Student write-up

PS-II project title: Enhancement of Schema Registry Maven Plugin

Short summary of work done during PS-II: Maven plugins can be used to create files, compile code, test code and automate many tasks. Maven plugin provides an easy way to talk to the Schema Registry. With the new goal, the users can test schemas locally. This allows for the testing of multiple schemas which may only be in the development environment. If the compatibility tests are passed then, the schema is registered to the production environment. The process of registering new schemas can now be streamlined with maven plugins. A continuous integration/continuous delivery pipeline can be made using GitHub actions on pull requests and merging branches.

Tool used (Development tools - H/w, S/w): Java, Maven, Github.

Objectives of the project: The project aims at two new goals: 'test-local-compatibility' and 'derive-schema' to the Schema Registry Maven Plugin and to create a CI/CD pipeline using GitHub Actions to demonstrate its usage.

Major learning outcomes: Learning about Apache Kafka, Schema Registry and Maven.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment is great. All the members were supportive. We were given ample time at the start of the intern to learn about Kafka, Schema Registry and internal tools used. Both the starter project and major project were clearly defined. We were expected to complete both and ship them. You are entrusted with responsibility of tasks and given ownership for your work.

Academic courses relevant to the project: OOP

Name: ANANAY GUPTA (2018A7PS0203H)

Student write-up

PS-II project title: Customer workflow automation framework

Short summary of work done during PS-II: Built a microservice for the automation framework with a lot of APIs and features. And apart from that a prepared a POC model for Central Monitoring

Tool used (Development tools - H/w, S/w): Python, Fast API, Docker, Kubernetes, AWS.

Objectives of the project: Build an automation framework for replicating the client environment on the company's server. This framework will primarily be used for testing.

Major learning outcomes: DevOps and Software development.

Details of papers / patents: None

Brief description of working environment, expectations from the company: It was work from home internship. I was just expected to complete my work within the given period. No office

timings were there. There was total flexibility in when I wanted to work. Apart from that I was expected to attend some meetings, usually one hour per day. My average work was around 6 h / day.

Academic courses relevant to the project: Computer Networks, Operating System.

Name: PARTH AGRAWAL (2018A7PS0218G)

Student write-up

PS-II project title: Enhancement of Maven Plugin & Integration of AsyncAPI into Confluent Platform

Short summary of work done during PS-II: Enhancement of Maven Plugins: Adding the set-compatibility goal to the existing maven plugins of Confluent. This allows users to change the compatibility type of the schema. Wrote Java code which communicates with API Endpoints. Integration of AsyncAPI: In the forward tooling part, I created a way to fetch details of a Kafka cluster like topics, subjects, schemas, tags, etc. and create an AsyncAPI Specification YAML file. In reverse tooling part, I created a Kafka topology from an input AsyncAPI specification file.

Tool used (Development tools - H/w, S/w): Java, Golang, Apache Kafka, IntelliJ, GoLand, Github, AsyncAPI.

Objectives of the project: Enhancing Maven Plugin goals for Schema Registry: Set-Compatibility and Download, AsyncAPI Spec creation for a given Kafka cluster, Creating Kafka topology from specification file.

Major learning outcomes: Golang, Java, Apache Kafka, Maven plugins, AsyncAPI, API Calls, Backend development.

Details of papers / patents: No papers published.

Brief description of working environment, expectations from the company: The working environment is very good and conducive. I found my manager and mentor pretty easy to communicate and work with. The company respects the needs of the employees. It provides many perks like Recharge Days & Meal Reimbursements apart from flexible working hours and good Work-Life balance. You can expect a good experience in your PS2.

Academic courses relevant to the project: OOP, DSA.

Name: KULKARNI HRITHIK VENKATESH (2018A7PS0278H)

Student write-up

PS-II project title: Customer workflows automation framework

Short summary of work done during PS-II: Continuous Integration Gating has been explored and created for the project. Tox has been used to integrate the tools Flake8, Mypy and Pytest in separate virtual environments. The coding guidelines have been framed in the style guide tool flake8 and the typing annotations have been fixed for the project. Extensive testing of the cluster with production and consumption of data has been completed using the data generators like Kafka producer Consumer and Trogdor. In parallel, the task of injecting faults into the kubernetes cluster using chaos mesh has been performed. Design has been finalised for creation of a new service for managing the clusters on Confluent Cloud.

Tool used (Development tools - H/w, S/w): Git, Docker, Kubernetes, AWS, Python.

Objectives of the project: Customer workflow automation tools aims to automate the task of bringing up the customer workflows and easily debug the failures arising from the complex pipelines. These clusters can either be managed on Confluent Platform or on Confluent Cloud.

Major learning outcomes: Working of Confluent Kafka and Confluent Cloud, E2E Deployment of frameworks, working with open source tools like chaos mesh along with Confluent's packages.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The mode of working was remote but the mentors and manager were always available to clear doubts and remove ambiguity. Adequate time was given to learn about the technology stack being used and tasks were given to prepare us for the main project. The main expectation was to create a base framework and test it well.

Academic courses relevant to the project: Object Oriented Programming and Database Systems.

PS-II Station: Credit Suisse - Finance Change, Pune

Faculty

Name: Bandi Venkata Prasad

Student

Name: AVANTIKA (2018A1PS0730P)

Student write-up

PS-II project title: Agile implementation of change management for generation of financial statements and regulatory reporting

Short summary of work done during PS-II: Each quarter the work started with setting the quarterly objectives and deciding deliverables in consultation with other teams. After this was established, manual reconciliations were built for relevant entities. This was followed by writing

and executing test cases on these recs to ensure there were no discrepancies. The identified discrepancies were then drilled downed, analysed and flagged for further remediation.

Tool used (Development tools - H/w, S/w): SQL, MS Excel.

Objectives of the project: The end to end agile implementation of novel change management practices employed in the banking sector to collect and analyze trade data. These efficient methods of data aggregation enable generation of financial statements for use by internal and external.

Major learning outcomes: Knowledge Acquired: Agile Methodology, Scrum, Data Flow in Deal Booking, Bank Reconciliation procedure and its technicalities.
Skills learnt: SQL, Advanced Excel.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was very congenial. My team members and manager were very supportive and helpful. They onboarded us by holding special sessions to bring us up to speed with the technicalities of their work and were always available to answer any and all questions. The workload was also manageable and rarely did I have to work till odd hours in the night. Overall, the company culture is very welcoming and inclusive.

Academic courses relevant to the project: Fundamentals of Finance and Accounting.

Name: DAKSH PANDEY (2018A3PS0642H)

Student write-up

PS-II project title: Automation / development of data processing activities

Short summary of work done during PS-II: Finance change, in particular, deals with many data. My team's role was to ensure accurate program and project data reporting within the CFO. My task was to assist the team by creating a set of VBA macro, which would reduce the workload and increase efficiency. I also made several Qlik Dashboards, allowing the team to streamline information retrieval and create a platform where other teams can also see their progress and data quality issues.

Tool used (Development tools - H/w, S/w): Excel, VBA Macro, Power query, Qlik Sense.

Objectives of the project: Providing automation to data processing activities in order to reduce work load.

Major learning outcomes: Advanced Excel, Qlik Sense, Soft Skills.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment is supportive. Everyone, including senior management, is super approachable and friendly. Expectations mainly vary from team to team. My team, in particular, needed help with data processing. Hence my work was primarily independent of that of the team. Everyone tries to help you to the best of their capabilities. Not much workload, but it is still team dependent.

Academic courses relevant to the project: No.

PS-II Station: Credit Suisse - Non-Financial Risk Management, Mumbai

Faculty

Name: Bandi Venkata Prasad

Student

Name: SREEDEVI G K (2020H1490807P)

Student write-up

PS-II project title: Data governance

Short summary of work done during PS-II: As a member of the non-financial risk management team, I help the data governance, and analytics division, monitor and confront the bank's risks related to compliance failures, misbehaviour, technology, and other operational difficulties. I learned about the department's multiple teams, their functions, and the domain's major risks., also about the controls used to limit these risks and reduce the financial and non-financial losses that come with them. I've also taken responsibility and accountability with tasks and made sure the key deliverables were completed on time. I've been proactive and also reach out to my managers to ensure accuracy and timeliness to meet their expectations.

Tool used (Development tools - H/w, S/w): MS-Excel , MS PowerPoint, MS-Word, and Credit Suisse reporting tools.

Objectives of the project:

- Consolidation of operational risk incidents occurring at global level across all divisions and reporting them to Board of Directors and risk management committees.
- Analysis of Incident metrics for Annual Operational Risk Appetite setting and automation.

Major learning outcomes: Learned the basics of NFRM, including what types of risks (market, operational, liquidity, credit risk, and so on) are involved, what are risk indicators, different types of reports, the risk register, the roles and responsibilities of data providers, risk reporting contacts, report owners, and metric owners, and so on. Understood the necessity for a risk and control framework to manage operational hazards, as well as how we define risk appetite, the different forms of risk and how they're classified, and industry lingo. Knowledge about the application tools used by Credit Suisse NFRM team.

The importance of Implementing data sharing agreements across teams to help meet the requirements of the data protection principles. It helps to justify data sharing and demonstrate that the teams have been mindful of, and have documented, the relevant compliance issues.

Details of papers / patents: None

Brief description of working environment, expectations from the company: As a whole, the team is really encouraging and supportive. They were quite helpful in providing me with the time and resources I needed to grasp things that I was unfamiliar with. Including an intern into their team as a normal employee shows their values; for instance, attending high-level management meetings or asking anyone for information, motivation or direction.

Academic courses relevant to the project: Financial Management and Accounting and Corporate Finance.

Name: GOPANI KAUSHAL ATULKUMAR (2020H1490822P)

Student write-up

PS-II project title: Non-financial risk management through risk and control oversight

Short summary of work done during PS-II: Actual Work: Completing all obligatory modules and trainings in order to gain a better understanding of the bank and its policies. Collaborating with the Control and Assurance team on critical control inventory management and analysis across the bank. Preparing and assisting team for preparing monthly Control Editorial Board Deck and presenting across all divisions of CRO and CCO. A data-driven assessment was used to conduct a key control analysis. Comparing the outcomes of the study between quarters and assisting the Group Head in generating a report of important findings to submit to top management in order to improve the NFR framework. Interacting with team members and performing ad-hoc work as and when required by the team. Identifying, measuring and assessing the effectiveness of controls whether manual or automated on the basis of data driven analysis. On the basis of major taxonomy categories of risk incidents happening, it is analyzed whether controls shall be automated or not. What percentages of automation is required if need of automation arises and comparing the levels with set standards? Main analytics tools used are MS Excel, DNA and QlikSense along with MARCS, GRACE and MICOS. All the findings are supposed to be presented in best graphical and visually elaborative way possible.

Tool used (Development tools - H/w, S/w): MS Excel, QLIKSENSE, GRACE, MARCS.

Objectives of the project: To assist the team in preparing Monthly Controls Editorial Board Deck: Control automation assist in timely and accurate delivery of monthly MI Reporting for CRCO Operational Control Landscape concepts, performing guidance sessions across CRCO division.

Major learning outcomes:

- Worked on bank wide key control inventory management
- Understood Key Non- Financial Risks in banking world and controls applied to mitigate them
- Comparing the results of analysis over various quarters and highlight the problems
- Got opportunity to work with Director CRCO Controls and Oversight, assisting him and got great learnings from him
- Got opportunity to work closely with VP Controls and Oversight under her mentorship
- Prepared key findings to help them present with team before senior management CXO level (40+ CXOs at monthly conducted CEB)
- Handling large data in excel, soft skills and CSR events

Details of papers / patents: NA

Brief description of working environment, expectations from the company: I am getting the rich exposure to learn about the policies, procedures, strategies employed and actions taken to achieve the objectives of the bank. I find myself lucky to have worked with such experienced individuals, help and learn from them. Overall the team bonding is amazing and the environment in the organisation support new innovation and motivates an individual to present views with transparency and equality.

Academic courses relevant to the project: Leading Modern Organization, Business Statistics, Business Analytics.

PS-II Station: Credit Suisse - Product Control, Pune

Faculty

Name: Bandi Venkata Prasad

Student

Name: AMAN LADDA (2017B3A30997H)

Student write-up

PS-II project title: Independent price verification of recovery rates

Short summary of work done during PS-II: The work allotted to me was to understand the pricetesting of the recovery rates and calculate the impact of the risk the asset holds.

Tool used (Development tools - H/w, S/w): Excel

Objectives of the project: Understand the process involved pricetesting of recovery rates.

Major learning outcomes: Product control processes and necessities.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The internship was entirely work from home hence i did not have the opportunity to experience the office space, but the manager and the mentor were both very helpful and were present to resolve any doubts. The expectation from me was to learn the process as soon as possible and take on the job quickly.

Academic courses relevant to the project: None

PS-II Station: Credit Suisse - Quantitative Analysis & Technology, Mumbai

Faculty

Name: Bandi Venkata Prasad

Student

Name: VIBHOR JAIN (2017B3A10654P)

Student write-up

PS-II project title: Backtesting methodology

Short summary of work done during PS-II: Assessed the risk factors of various asset classes by performing Monte Carlo Simulation on 7yrs data based on notional trade values. Wrote python scripts to perform Geometric Brownian Motion, Probability integral transform and p-values of various asset classes. Ensured validity of the Bank's internal models by performing Back testing on the risk factors to calculate Counterparty Credit Risk.

Tool used (Development tools - H/w, S/w): Python, c#, excel.

Objectives of the project: Perform back testing of various financial products and trade positions.

Major learning outcomes: Various financial products, Risk management, Python, c#

Details of papers / patents: None

Brief description of working environment, expectations from the company: Credit Suisse is a European IB so the work culture was great. Great learning opportunities and directional work with good work life balance.

Academic courses relevant to the project: DRM, FRAM, FINENG.

Name: GANDHI PATHIK HITESHBHAI (2017B3A30680G)

Student write-up

PS-II project title: Credit scenario stress testing

Short summary of work done during PS-II: Studied about the process used to calculate the exposure and unsecured MtM of various transactions. Performed Impact Analysis to analyse the implications of a scenario change on various asset classes (Equity, Interest Rate, Foreign Exchange, Commodity and Credit Spreads). Developed a tool to perform aggregation of Secured Financial Transactions (SFT). Also assisted the team in performing BAU activities like addressing ad-hoc queries related with counterparty credit risk.

Tool used (Development tools - H/w, S/w): Python, SQL, MS Excel

Objectives of the project: Learn about techniques used to measure counterparty credit risk under diverse scenarios.

Major learning outcomes: Learnt about various scenarios (both historical and hypothetical) and the effects of these scenarios to the portfolio or sub portfolio at various levels. Also learnt about the counterparty credit risk i.e. Credit Exposure associated with these scenarios for different asset classes and means to mitigate the risk.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The internship was conducted in WFH mode. The team is very supportive and guides us at every step. The company doesn't differentiate between interns and full time employees so they expect interns to take ownership of their work. Basic understanding of finance and a bit of knowledge of Python, SQL and Excel is good to have for this role.

Academic courses relevant to the project: Derivatives and Risk Management, Security Analysis and Portfolio Management, Financial Risk Analytics and Management.

Name: ATUL RAVI UNNI (2018B4PS0092H)

Student write-up

PS-II project title: Credit risk scenario modelling

Short summary of work done during PS-II: Worked and helped monitor credit risk models. These models are stress tested for various scenarios and the responsibilities given to interns is to help perform control checks and present the results.

Tool used (Development tools - H/w, S/w): Excel mainly.

Objectives of the project: Stress Testing Scenarios.

Major learning outcomes: 1) Learnt Credit Risk 2) Learnt stress testing 3) Learnt and performed control checks.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very relaxed, good work-life balance, helpful team. Required to be a self-starter and initiate, otherwise few responsibilities would be given. Very important to learn R and Python to contribute effectively.

Academic courses relevant to the project: FRAM mainly.

PS-II Station: Credit Suisse - Risk & Finance Data Analytics, Reporting, Mumbai

Faculty

Name: Bandi Venkata Prasad

Student

Name: POLISETTI SAI VAMSI (2018A2PS0675H)

Student write-up

PS-II project title: Risk reporting & analytics at Credit Suisse

Short summary of work done during PS-II: Handling of excel databases for legal entities like VaR, SVaR, RNIV, IRC etc. for various business levels and running them on daily basis to check for any breaches. • Due Diligence: Fact checking the financial data and numbers reported in documents / slides against official sources and marking and updating mismatching information as required. • Preparing reports on breach analysis in VaR, limit summary, market risk reports for CS Schweiz, Nassau and Saudi branch, CSD report, Hierarchy change analysis report and book status report. • Addressing any breaches to the respective teams and preparing a report for the same with proper reasoning. • RNIV calculation tool using Macros • Automated the SLA tracker file which keeps track of book locking time on a monthly basis.

Tool used (Development tools - H/w, S/w): MS EXCEL ADVANCED, VBA and CS internal tools.

Objectives of the project: Analysing and reporting breaches observed in any of the legal entities at various business levels. Finding the reason behind the breaches and keeping track of various daily activities like book locking.

Major learning outcomes: Advanced use of MS Excel, RNIV and VaR calculation models.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Focusing on automating the work as much as we can to reduce the work load, diligent work expected, compliance to all the company policies, convenient work hours.

Academic courses relevant to the project: Business Analysis and Valuation, Derivatives Risk Management, Financial Management.

Name: BANDARU LAKSHMI DEVI (2020H1490817P)

Student write-up

PS-II project title: Market risk stress reporting for credit spread scenarios

Short summary of work done during PS-II: Being a part of the Credit Spread Scenarios team of Market Risk Stress, the major objective is to understand the at-hand scenarios and perform strategic analysis and stress testing for the required portfolios. Any breaches or risks involved are reported to the market risk managers for further investigation/mitigation. The estimated PNL is also calculated for these given scenarios. The day-to-day work involves working on different internal tools used by the bank and analytical tools like MS Excel, VBA, Qlik Sense, etc that help in analyzing and reporting data. The work experience gained here is a direct practical experience of learning from subjects such as Financial Engineering and Financial Risk Management.

Tool used (Development tools - H/w, S/w): MS Excel, VBA, Qlik Sense, Bumblebee plugin, Mars Enquiry tool, internal bank tools.

Objectives of the project: 1. Understand the financial derivatives and risk management methodologies. 2. To analyze different scenarios and report any risks involved for the given portfolios.

Major learning outcomes: Knowledge of financial derivatives and fundamentals of Risk Management.

Hands on experience on analytical tools like MS Excel, VBA, Qlik Sense, etc.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The company has different departments for financial and non financial risks. The CRCO department (Chief Risk & Compliance) has different teams involved such as Market Risk, IT, Data Quality, etc. A typical working team consists of 6-10 team members. The company has certain procedures/policies that are expected to be adhered by all the employees. The information/data dealt with is confidential in nature and has to be protected in all ways. The team expects a basic knowledge on the finance domain and market risk concepts that are covered in 'Fundamental Risk Management' and working knowledge on basic analytical tools.

Academic courses relevant to the project: Financial Engineering, Financial Risk and Management.

Name: RIYA GUPTA (2020H1490847P)

Student write-up

PS-II project title: Market risk validation and reporting for the daily bau process

Short summary of work done during PS-II: I am working here, as an intern in the Market Risk Analytics team and the following includes my daily BAY work: 1. Ensure completeness of underlying sensitivity data and do necessary changes and amendments as required if any error occurs. 2. Review and validate material day on day changes in underlying risk measures. 3. Liaise with respective IT teams to resolve any data related issues. 4. Deep dive in data to investigate if any breach is found on the threshold values set for the respective risk measures. 5. Provide accurate commentary to highlight drivers of material calculated measures in validation templates. 6. Publishing the final report of validation templates.

Tool used (Development tools - H/w, S/w): Excel, Powerpoint, Qlik Sense, their internal systems.

Objectives of the project: Publish the daily risk report, by ensuring all the data loaded is correct and there are no DQ issues along with commenting off the driver of any major day on day change.

Major learning outcomes: • Worked on bank-wide market risk analytics and management.

- Understood Key Market Risks in the banking world and controls applied to mitigate them.
- Validating the changes in market risk measures daily.
- I got the opportunity to work with Director and VP, assisting them and learning from them.
- Handling extensive data in excel.
- Learnt to use and run all the software used by the company.
- Team management, soft skills and CSR events.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: With this team, I am getting the rich exposure to learn about the policies, procedures, strategies employed and actions taken to achieve the objectives of the bank. I am also getting to learn the whole process of market risk calculation and then how its impact the bank's trades. I find myself so lucky to have worked with such experienced individuals, help and learn from them. As completing my mid journey of my internship, I am very much grateful to the college for providing me this opportunity to work with the team.

Academic courses relevant to the project: Finance realted subjects, Business Analytics.

PS-II Station: Credit Suisse - Risk & Finance Data Analytics, Reporting, Pune

Faculty

Name: Bandi Venkata Prasad

Student

Name: DESAPANDYA SAI CHARAN (2020H1490818P)

Student write-up

PS-II project title: Risk and financial data analytics, reporting

Short summary of work done during PS-II: As a part of Capital CCP team my day to day activities include to work queries from BMR. These include analysis of exposure movement for different counterparties & reason behind these movement. If they are not as expected provide adjustments. To check Wrong Way for all counterparties daily from the data collected & if there are any threshold breaches raise it with the concerned teams.

Tool used (Development tools - H/w, S/w): MS Excel, SQL, Company's internal tools.

Objectives of the project: To validate the exposure move analysis of different counterparties of ETFO & Swaps and provide commentary accordingly, if not adjust them tactically.

Major learning outcomes: Understood the importance of risk management, learnt about various financial derivatives, asset class, different regulators and Basel norms, how clearing of trades take place & how exposure movements are analyzed.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Credit Suisse is a great place to work with. The team is always supportive and have always gone an extra mile to clear my doubts. The firm doesn't show any differentiation between an intern and full time employee. They expect hard work, integrity and most importantly for those who are keen to learn.

Academic courses relevant to the project: Financial Engineering, Business Analysis & Valuation, SAPM.

Name: RASHMITA DEB (2020H1490843P)

Student write-up

PS-II project title: Exposure move analysis

Short summary of work done during PS-II: The project in which I am currently working at Credit Suisse deals in Exposure Move Analysis for OTC derivatives. The project deals with validation of credit risk exposure calculation at a counterparty level for business line like OTC derivatives from regulatory perspective. The regulatory authority as in PRA which is Prudential Regulatory Authority defines some rules and regulations under which OTC derivatives and corresponding analysis takes place. It is using various methodologies like SACCR, CEM, IMM, etc. Effective Expected Positive Exposure (EEPE) is analyzed, stressing on their counterparties namely, Positive Expected Exposure (PEE), Replacement Cost (RC), Exposure at Default (EAD) of traded products. Major analysis is done on different counterparties and comments are provided for Day on Day, Week on Week, Quarter on Quarter and Month on Month exposure moves.

Tool used (Development tools - H/w, S/w): SQL, Tableau based tools.

Objectives of the project: Analysis of exposures of counterparty credit risk.

Major learning outcomes: 1. Financial risk 2. Financial derivative industry 3. Risk analytics.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was amazing. Team and manager was supportive and provided sufficient amount of guidance & mentoring.

Academic courses relevant to the project: Financial Engineering.

PS-II Station: Credit Suisse - Sustainability, Research & Investment Solutions (SRI) - IS&P Global Research, Mumbai

Faculty

Name: Bandi Venkata Prasad

Student

Name: PARUL DEORI (2020H1490848P)

Student write-up

PS-II project title: Automation of onboarding buddy program and supportive role in flds is&p team

Short summary of work done during PS-II: I have designed the workflow of the automation process for the buddy program, learned VBA and wrote VBA code to implement the workflow logic. Taken over FLDS tasks as a replacement of one employee. Report preparation and formatting on weekly basis. Monitoring risks and its impacts.

Tool used (Development tools - H/w, S/w): MS Excel, MS Powerpoint, Inhouse Risk monitoring tools.

Objectives of the project: To automate the workflow of assigning buddies to new joiners and perform day to day tasks of FLDS team.

Major learning outcomes: VBA, MS Excel, MS Powerpoint, Risk Management.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is flexible, adaptive and inclusive. The company pays heed to its employees' personal objectives.

Academic courses relevant to the project: NA

PS-II Station: Custom furnish, Pan India

Faculty

Name: Arun Maity

Student

Name: PRAFFUL RAMESH GAWANDE (2020H1060254H)

Student write-up

PS-II project title: Design and development of adjustable dumbbell

Short summary of work done during PS-II: Design and analysis of mechanism for the adjustable Dumbbell.

Tool used (Development tools - H/w, S/w): SolidWorks, Ansys Workbench.

Objectives of the project: • To design adjustable dumbbell varying from 2kg to 25 kg with an increment of 1kg.

- To design the mechanism so as to operate rotational to linear motion smoothly and able to hold varying weight.
- Locking mechanism is to be design so to hold the weigh.

Major learning outcomes: Product Design process, DFMA, Design of JIGS and fixture.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good working environment.

Academic courses relevant to the project: Product Design, Strength of Material, Finite Element Analysis.

Name: AKSHAY SANJAY BHOYAR (2020H1060267H)

Student write-up

PS-II project title: Design and development of adjustable dumbell

Short summary of work done during PS-II: Project mainly focuses on design and development of adjustable dumbell varying the weight from 2 to 25 kg . For selecting different weight we need to design rotational to linear mechanism which currently not used by the competitor. Making a prototype of conceptual design. Helping seniors in the ongoing production plan set and fixture design.

Tool used (Development tools - H/w, S/w): Solid work, Ansys Workbench.

Objectives of the project: To design adjustable dumbbell varying from 2kg to 25 kg with an increment of 1kg.

Major learning outcomes: Able to gain knowledge of software tools like Solid work, Catia and Ansys Workbench.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was generally relaxed. Interns have assigned a project of design and development of adjustable dumbbell which we have to do it from the beginning and also we need to help the seniors on the outgoing first version of dumbbell production plan and fixture design.

Academic courses relevant to the project: FEM and CAAD is relevant to the project.

Name: OMKAR SACHIN SHAHANE (2020H1410202H)

Student write-up

PS-II project title: Design and development of adjustable dumbbell

Short summary of work done during PS-II: The project was a design and development of the new product, the company is going to launch the product to the market. So the Design and the CAE analysis of the Product is done also the manufacturing complexity of the the product is done to minimize the cost of production. To reduce the assembly time the production is planned and Jigs are also designed.

Tool used (Development tools - H/w, S/w): Solidworks, Ansys structural, UGNx.

Objectives of the project: To design adjustable dumbbell varying from 2 to 25 kg with an increment of 1 kg.

- To design the mechanism so as to operate rotational to linear motion smoothly and able to hold varying weight.
- Locking mechanism is to be design so to hold the weight.

Major learning outcomes: CAE, 3D modeling mechanisms.

Details of papers / patents: No paper

Brief description of working environment, expectations from the company: Good working environment , one has to work both on desk and ground level.

Academic courses relevant to the project: Strength of materials, FEM, mechanisms and robotics.

PS-II Station: DataZymes Analytics, Bengaluru

Faculty

Name: Bharathi R

Student

Name: S ANJANA (2020H1080307P)

Student write-up

PS-II project title: CI in oncology

Short summary of work done during PS-II: The global pharmaceutical industry in itself is highly competitive, driven by a constant need to innovate and discover new drugs producing and manufacturing drugs and medical devices is an expensive business Biotechnology and pharmaceutical companies started to take competitive intelligence services in order to gain an advantage over their competition. During the course of my internship at DataZymes I have worked on various Oncology Timeline reports. Some of these include: NSCLC Competitor Timelines CRC

Competitor Timelines MSI-H Competitor Timelines RCC Competitor Timelines Pancreatic Cancer & CD-40 Competitor Timelines NSCLC Monthly Summary report Maintaining these reports were my sole responsibility as given by the Team Lead & Manager. As a result, I've consistently worked on maintaining & updating the following reports as per the Client's needs whilst keeping track of the Landscape of these respective indications.

Tool used (Development tools - H/w, S/w): Think-cell

Objectives of the project: To study the competitive landscape in various oncology indications and deliver meaningful reports that are beneficial to the client; To send timely updates on these reports regarding the various events taking place in the specified indication and summarize it.

Major learning outcomes: Learnt various techniques & strategies that a Life Sciences consulting company utilizes in order to be of service to their clients.

Functioning of CR and the various approaches used in order to get the desired outcome.

Gained a lot of in-depth knowledge on the design & complex procedure behind the running of clinical trials and their process of gaining approvals from various regulatory bodies.

Details of papers / patents: I have worked on various Oncology Timeline reports. Some of these include: NSCLC Competitor Timelines, CRC Competitor Timelines, MSI-H Competitor Timelines, RCC Competitor Timelines, Pancreatic Cancer & CD-40 Competitor Timelines, NSCLC Monthly Summary report.

Brief description of working environment, expectations from the company: DataZymes is a boutique Pharma Analytics & Data Science company focused on combining Digital Technologies, Data Science, and deep domain expertise to make business processes in Life Sciences Organizations more intelligent and adaptive. The organization possess a start-up work culture which enables it's members to interact proactively and allows every individual to come forth with their innovative ideas and opinions and be heard. During my internship, a hybrid system was followed where we were expected to report to the office 3 times a week. This helped foster bonds with other employees in person and also interact actively with our peers and seek their guidance directly when in need. They also inculcate ownership from the beginning of our work holding us responsible for minor to major tasks. Overall, it has a good learning environment for the initial phases of one's career.

Academic courses relevant to the project: CI requires the application of concepts from subjects like Clinical Research and QARA which were a part of the academic syllabus in M.Pharm. The course Advanced Pharmacology also helped along the duration of the project.

Name: SHALU MISHRA (2020H1290004P)

Student write-up

PS-II project title: Competitive intelligence in healthcare focusing on anti-microbial drugs drugs in development for ABSSSI, cUTI, cIAI, HABP, VABP

Short summary of work done during PS-II: With the increase in the number of competitors in the market, every company needs to find its foothold to be able to deliver to the needs of the individuals suffering from various diseases. Competitive intelligence is a major integral part of knowing the market and its rivals. Competitive intelligence is the way through which the dynamism of the market is known and gauged by the company and the rival companies' assets. It systematically collects and analyzes information from multiple sources and a coordinated CI program. It is the action of defining, gathering, analyzing, and distributing intelligence about products, customers, competitors, and any aspect of the environment needed to support executives and managers in strategic decision-making for an organization. Some screenshots have been added below showing a competitive intelligence product based on secondary research. The various competitors have been added as well from different other companies. The various competitive assets for these particular indications have been mentioned based on their level of development or commerce.

Tool used (Development tools - H/w, S/w): MS Word, MS Excel, MS PowerPoint, Google search.

Objectives of the project: Competetive Intelligence, Market Analytics, Alert Creation.

Major learning outcomes: Learnt about competitive intelligence, client demands, alert creation and healthcare analytics along with secondary research.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: DataZyme Analytics is an Indian company specializing in Pharma Analytics & Data Science company focused on combining Digital Technologies, Data Science, and deep domain expertise to make business processes in Life Sciences Organizations more intelligent and adaptive. Pharma analytics is a niche area with a lot of exciting possibilities, which we are constantly working on. The company was incorporated on 5th July, 2016. The company has offices in Bangalore and Noida in India along with offices in Boston, Chicago, Philadelphia and San Francisco. The world encompassing locations are very handy and effective in catering to the business needs of various clients across the globe. The working environment is very dynamic yet calm. There is a positive competitiveness between people that results in fabulous outcomes and learnings. I expect to grow with the company and be able to do justice to my quest to learn more.

Academic courses relevant to the project: Somehow.

Name: SUNAINA NAG (2020H1290009H)

Student write-up

PS-II project title: Understanding the competitive intelligence process and doing secondary research for preparing client and indication-specific regulatory timeline reports and device profiles

Short summary of work done during PS-II: Breast cancer: HER2+, TNBC, HER2-low, and HR+HER2-breast cancer are the four types of breast cancers I am working on. Scouting of updates such as new trials uploaded in Ct.gov, regulatory submissions/ approvals, upcoming oncology conferences, and data readouts expected for the trials included in the timeline report is done every week. Melanoma: I am also assigned with melanoma indication. Scouting of updates

such as new trials uploaded in Ct.gov, regulatory submissions / approvals, upcoming oncology conferences, and data readouts expected for the trials included in the timeline report is done every week Cholangiocarcinoma: A list of approved drugs with trial and work in progress Social media analysis: This project was an ad-hoc in which we had to collect and analyze audience data shared on social networks to improve an organization's strategic business decisions. This was done to cover insights from ASCO 2022 conference held.

Tool used (Development tools - H/w, S/w): MS - excel and MS-powerpoint.

Objectives of the project: To understand how the CI process works, data scouting, learning to make presentable excel and powerpoint presentation and to understand the type of oncology assigned in depth.

Major learning outcomes: Secondary research, MS - power-point, MS- excel, data scouting, oncology indications and treatments, conference coverage.

Details of papers / patents: Not applicable

Brief description of working environment, expectations from the company: The staff is very friendly, encouraging. I got to learn many new things and had recently taken to a small trip to up team bonding.

Academic courses relevant to the project: Yes

Name: K KAVANA (2020H1460376H)

Student write-up

PS-II project title: Competitive intelligence monitoring in inflammation & immunology diseases & parkinson's disease

Short summary of work done during PS-II: In this project, I have worked in a such a space wherein my role is to perform continuous CI monitoring for inflammation and immunological diseases as well as Parkinson's disease for our clients. I have been involved in various aspects of CI monitoring and preparation of suitable databases and deliverables for the client which in turn can help them understand the key market players in that space, track the key research, regulatory and commercial/market events and trends in their core competitor's space. The data-derived CI deliverables will also help our clients to understand the implications of these key events on their research or market profile. The areas of CI that are covered as a part of my project include: Pipeline Intelligence, Clinical Trial Intelligence, Product and Company Intelligence, Conference Intelligence and News Intelligence.

Tool used (Development tools - H/w, S/w): Microsoft Office Tools (M.S Word, M>S Powerpoint, M.S Excel, M>S Outlook), Office Timeline Pro Software.

Objectives of the project: To identify and understand the unmet need in the field of inflammation, immunology diseases; to identify and understand the key market players in the above mentioned therapeutic areas; to track and understand the implications of key R&D and commercial eve.

Major learning outcomes: 1. Understanding of the disease area that I have worked, which include: Non-alcoholic steatohepatitis, Crohn's Disease, Netherton Syndrome, Parkinson's disease

2. Understanding the various nuances and key aspects related to CI
3. Tracking of key updates R&D, regulatory & commercial updates
4. Preparation of deliverables
5. Providing strategic insights to client

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The organization is a start-up firm with an extremely friendly and flexible working environment. The organization follows a flat structure and the senior employees are easily accessible for clarifications. The company followed a hybrid mode of working (remote and offline) which offered better convenience to the employees during the pandemic. Being a startup firm, the organization expects the new

employees, particularly freshers, to take up more responsibility at early stages which allows us to gain deeper knowledge and understanding of the projects and nature of work done by the firm.

Academic courses relevant to the project: Clinical Research, Quality Assurance and Regulatory Affairs.



PS-II Station: DBOI - Business Finance, Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: PUKHRAJ SHARMA (2018A4PS0534P)

Student write-up

PS-II project title: Reporting risk and PNL of portfolios, business finance

Short summary of work done during PS-II: I have learnt about the functionality of Investment banks and was fortunate enough to get a responsibility to manage complex portfolios on par with full time employees. I got to interact with various professionals in the field and was able to gain some insights into the corporate world. My Stake holder management and problem-solving skills were continuously tested on a daily basis while correcting the errors and finding the right root cause to fix the issue while reporting pnl and risk for different books.

Tool used (Development tools - H/w, S/w): Excel (other tools were company specific)

Objectives of the project: To understand and sign off all the risk and attributions of different trades in the portfolios daily.

Major learning outcomes: Learnt how finance is practically applied in an investment bank. It was a surreal experience seeing the theoretical knowledge being executed in reality and learnt the inside dynamics of how an investment bank works.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Great working environment, peers are very helpful and never shy away from helping you to learn and understand your daily BAUs. My supervisors helped me to adapt quickly and naturally to the company's workflow and environment and always provided their support to the best of their abilities.

Academic courses relevant to the project: SAPM, DRM, FRAM.

PS-II Station: DBOI - Credit Risk Data Unit (CRDU), Pune

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: RITWIK HORE (2018A5PS0499H)

Student write-up

PS-II project title: Financial risk

Short summary of work done during PS-II: The work done mainly included checking up on month-on-month variances for total capital demand and risk weighted assets and then analysing the variances to figure out what is causing them. This included checking up on data feeds and looking at the factors which drive the variances.

Tool used (Development tools - H/w, S/w): MS Excel, Qlikview.

Objectives of the project: To analyse month-on-month variances for total capital demand above a certain threshold.

Major learning outcomes: Theories related to expected credit loss, risk weighted assets.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: It has been a good learning environment with supportive co-workers.

Academic courses relevant to the project: Derivatives and Risk Management, Fundamentals of Finance and Accounting.

PS-II Station: DBOI - MRAC and MDSA, Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: NAYAK SWARAJ PANKAJ (2017B5A40133G)

Student write-up

PS-II project title: Market risk management

Short summary of work done during PS-II: 1. TCP reporting: Studied how the VaR limits for non-securitized TCP (Traded Credit Products) worked and to identify risk drivers in case of a limit breach. 2. As part of the MRAC credit team, managed risk for European Credit Trading desk (Market making desk), identified daily risk drivers and ensured net VaR and SVaR numbers are within the firm's risk appetite.

Tool used (Development tools - H/w, S/w): Excel, python, Tableau, prop. firm software.

Objectives of the project: To monitor and analyze daily and 10D VaR risk (along with manual additions) and to identify risk drivers and propose solutions.

Major learning outcomes: 1. How risk is managed for credit portfolios 2. Overview of credit value adjustments mandated by BASEL III.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: PS-II worked out of a hybrid model until the few weeks (3 days office + 2 days WFH). Company expects proper corporate etiquette and a decent understanding of financial markets, services offered and the current macroeconomic situation. Since Risk management is a specialized role, training would be offered, but there's an expectation that the candidate eventually learns enough about the systems to train himself and get an understanding of the processes being run everyday and what are their team's tasks/responsibilities as a whole.

Academic courses relevant to the project: Derivatives and Risk Management, SAPM, BAV.

Name: VEDANT SANJAY CHAUDHARI (2018A8PS0353P)

Student write-up

PS-II project title: Market risk data strategy and analysis

Short summary of work done during PS-II: Majority of the work allotted to me did not require any technical proficiency, though there are projects that require python, tableau. There is significant use of excel and company databases. There is analysis involved, but expect to be given basic work. I got to work on three long term projects.

Tool used (Development tools - H/w, S/w): NA

Objectives of the project: The team deals with risk factors, VaR/SVaR values.

Major learning outcomes: Concepts of risk, VaR, excel.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment is pretty relaxed. There is a certain amount of independence given with regard to work method, which is good. Work timings are quite fluid, the team arrives late and leaves late. Do not expect the team to constantly check up on you or allot you work. If you want to be part of a certain project/field, ask directly else you will be stuck with the basic stuff. There are also BITS seniors who are quite helpful.

Academic courses relevant to the project: NA

Name: PRADEEP SINGH (2018D2PS1178P)

Student write-up

PS-II project title: Market risk analysis & control

Short summary of work done during PS-II: Closely analysed derivative market. Worked on risk number and using relative tools for extraction data and analysing this with Excel and python scripts.

Tool used (Development tools - H/w, S/w): Advanced Excel, Python.

Objectives of the project: Analysing the daily market risk numbers.

Major learning outcomes: Analysing daily data using advanced Excel and python scripts. Using financial tools used by investment banks for market risk management.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Overall it was good.

Academic courses relevant to the project: FRAM, DRM & SAPM.

PS-II Station: DBOI - Non-Financial Risk Management, Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: AKSHAYA R (2020H1490829P)

Student write-up

PS-II project title: Non-Financial Risk management (Management Reporting Process)

Short summary of work done during PS-II: I worked as a part of the management reporting team and worked in the automation of risk appetite metrics.

Tool used (Development tools - H/w, S/w): Excel VBA Macros.

Objectives of the project: To study and practice various risk management techniques at different stages of risk management and include automation wherever possible.

Major learning outcomes: Risk management process, Risk monitoring, Managing reporting in financial institutions.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The team was very supportive and encouraged to bring in new ideas and guided me whenever necessary.

Academic courses relevant to the project: FRAM, DRM.

PS-II Station: DBOI - Valuation Control, Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: SINHA AADARSH RIKSHIT RAJESH (2017B3A30690H)

Student write-up

PS-II project title: Valuation control

Short summary of work done during PS-II: Valuation Control Group • In Model Risk Control Team, my primary responsibility is to ensure the assets are priced at Fair Value by assessing all the trades within the bank are using a correct model for pricing. • In Global Financing and Credit Trading Team, work involved running the CASH Tool to ensure the marked prices from desk were in sync with prices from market sources and running the STALE Marks tool to review that the desk is updating their marks on a regular basis.

Tool used (Development tools - H/w, S/w): MS Excel MS Access.

Objectives of the project: Valuation control

Major learning outcomes: Valuation of products using models and exception reporting.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Very supportive environment and peers, good learning experience, company expectation were for us to learn on the job and work for 4 to 5 h / day.

Academic courses relevant to the project: Financial Management.

Name: AISHWARYA G KUNKUR (2017D2PS1233P)

Student write-up

PS-II project title: Valuation control

Short summary of work done during PS-II: I was responsible for performing the Weekly Independent Price Verification (IPV) for the Counterparty Portfolio Management (CPM) business at the bank; mainly covering the credit derivative products and liaising with various teams within the department to consolidate the IPV results across various parameters for CPM. I was also responsible for publishing a consolidated IPV summary to various stakeholders like the Front Office, Business Finance and internal MVRM teams. I was also monitoring and reporting the IPV threshold breaches at parameter and business level; liaising with Front Office until breach closure to ensure that the credit curves are remarked in line with the market. I was also looking after the internal reporting and record keeping of all breaches within the Tolerance Breach Register (TBR). As a part of the CPM team I assisted in preparation of monthly Desk Valuation Packs that consolidated and highlights the testing summary at month-end and a part of the SOC control team I assisted with data consolidation, review and preparation of the SoX control framework across various teams within valuation control.

Tool used (Development tools - H/w, S/w): Excel

Objectives of the project: • Performing Weekly Independent Price Verification (IPV) for the Counterparty Portfolio Management (CPM) business at the bank; mainly covering the credit derivative products. • Liaising with various teams within the department to consolidate the IPV results.

Major learning outcomes: - How to perform independent price verification.
- Relevance of the SOX control framework and its workings.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: I worked in a nourishing corporate environment where I had team members who were ready to assist whenever I needed them to. I was constantly encouraged to acquire new skills and to take up tasks.

Academic courses relevant to the project: Derivatives and Risk Management | Financial Risk and Asset Management | Fundamentals of Finance and Accounting | Security Analysis and Portfolio Management | Business Analysis and Valuation | Financial Management | Financial Engineering | Principles of Economics.

Name: AMIT (2018A5PS0986P)

Student write-up

PS-II project title: Valuation control in Corporate Finance

Short summary of work done during PS-II: The primary role of the Corporate finance team under GVG is to test the pricing of various OTC products (that come under GTB and SCL business) marked by the desk and report the breach if found. Work involves daily collection, processing, and analysing of market data and performing weekly and monthly IPVs of the products and preparing the month end desk packs and valuation control reports.

Tool used (Development tools - H/w, S/w): MS Excel, VBA, Sledge, Python.

Objectives of the project: Weekly and monthly IPV testing and analysis of various OTC products under corporate finance and reporting the breaches to the desk.

Major learning outcomes: Learnt about how market valuations and risk management works at investment bank, and how to perform IPV testing and how various valuation processes are used for different types of securities / products and automation of various steps of IPV processes, MS Excel, macro, sledge and VBA.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very helpful working environment. There is enough flexibility for you to be able to explore various teams within GVG (Corporate Finance, Corporate Treasury, Global foreign exchanges).

Academic courses relevant to the project: DRM, FinMan, FRAM, BAV, SAPM.

PS-II Station: Dell R&D, Bengaluru

Faculty

Name: Vineet Kumar Garg

Student

Name: KRUPAL PATEL (2020H1030117H)

Student write-up

PS-II project title: Command line interface framework using input YAML file

Short summary of work done during PS-II: To design CLI framework, took a input command from a user, used given syntax database file for parsing. After user enters the command checking if command is exist in the database or not, if it exists then perform the syntax check for it. After successfully performing the syntax check validate the values entered by the user for each options. later using external mapping files display the help messages and create the output view.

Tool used (Development tools - H/w, S/w): Visual studio code, Putty, Sqlite3 browser, WinSCP.

Objectives of the project: To improvise the current model of the same cli for BMC.

Major learning outcomes: C++, OOPS concepts, Sqlite3 for C++, Standard coding guidelines, Algorithms, yaml, yaml-cpp, Linux environment.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Working environment is very supportive and encouraging.

Academic courses relevant to the project: C++ programming, Compile designing, Algorithms, SQL.

Name: DEBJANI GHOSH (2020H1120263P)

Student write-up

PS-II project title: Developing a reactive GUI using AngularJS and SSE protocol

Short summary of work done during PS-II: The GUI client of the product was not event-driven. Consequently, users didn't immediately know about the changes (if any) occurring in the backend. My task was to make the said web client reactive using AngularJS and SSE protocol.

Tool used (Development tools - H/w, S/w): HTML, CSS, JavaScript, AngularJS, Visual Studio Code, Gitlab.

Objectives of the project: To make a GUI reactive or event-driven.

Major learning outcomes: Front-end web development using HTML, CSS, JavaScript and AngularJS.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Working environment was good. Colleagues were supportive and knowledgeable. I expect to keep working on innovative projects and also be fairly rewarded for my work.

Academic courses relevant to the project: None

Name: GODBOLE PRACHI SUSHIL (2020H1120276P)

Student write-up

PS-II project title: Auto generation of platform configuration for OpenBMC

Short summary of work done during PS-II: To automate the process of creating platform configurations in JSON format, a new tool was developed. This tool aims at creating custom JSON for the platform adhering to OpenBMC standards. To develop this, sample JSONs were created manually. I tried to auto generate it based on the sensor data available in the form of Excel sheets. The programming language used is Python. Platform name is taken as input to customize it based on the platform. To avoid any hardcoding on script, a custom generated JSON template is used. This template is parsed and corresponding functions are called to fill data in the appropriate places. A custom JSON schema is also created to validate the output.

Tool used (Development tools - H/w, S/w): Python as programming language, conda for virtual environment and JSON.

Objectives of the project: Create a tool which can automate process of making customized JSON configuration for storing the platform configuration for each platform and enable platforms quickly as and when required.

Major learning outcomes: I gained a high-level knowledge of server hardware design and how it is remotely monitored. I was given a thorough understanding of the many hardware components of servers, such as the CPU, RAM, SSD, FRU, Risers, Fans, and so on. I understood how remote server monitoring is done and its advantages. I was given a codebase to understand the current code and was instructed to read through the OpenBMC documentation. I learnt how to use the xml files and navigate through the proprietary software. To achieve generalization and reusability of the interfaces various methods were proposed and implemented by me. I learnt to navigate the corporate environment and how to reach out to people.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was supportive and encouraging. My mentor and manager guided me throughout my internship with patience and explained everything in detail. I also joined a few Employee Resource Groups (ERGs) to help support social causes like working towards betterment of the planet or working for women empowerment. I got a good experience of working for a product based company and the expectations they have from their employees, especially those in the Research and Development Department.

Academic courses relevant to the project: NA

PS-II Station: Development Consultants Pvt. Ltd., (DCPL), Kolkata

Faculty

Name: Arun Maity

Student

Name: MOHANISH JIJJA (2018A2PS0935P)

Student write-up

PS-II project title: Designing of structures for steel plant

Short summary of work done during PS-II: I was involved in generating STAAD model, load calculation, drawing input, analysis and design using STAAD pro software for the structures such as compressor house, pipe supporting structures, control room, overhead water tank and water sump for steel plant project in Aurangabad of NLMK group.

Tool used (Development tools - H/w, S/w): 1. STAAD pro. 2. AutoCAD 3. MS excel.

Objectives of the project: The scope of the project is to provide an abstracted view of structural engineering components of projects such as the building framing system, loading details, and analysis and design methods.

Major learning outcomes: a. Using STAAD pro professionally. b. How to use various IS code data in designing structures. c. How to perform critical analysis of any structure. d. About the working culture of the consultancy firm.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was very nice. All the mentors and seniors were very good and helpful to me. It was a great experience. The expectations from the company was to give us the right projects and corporate experience which is of great value to us.

Academic courses relevant to the project: 1. Analysis of structures 2. Design of concrete structures 3. Design of steel structures.

PS-II Station: Development Consultants Pvt. Ltd., (DCPL), Mumbai

Faculty

Name: Pavan Kumar Potdar

Student

Name: PANDYA HARMISH PRAGNESHBAI (2020H1430061P)

Student write-up

PS-II project title: Reliance Jio petrol pump

Short summary of work done during PS-II: Design and detail of petrol pump. Checking design documents of various structures as per indian standards.

Tool used (Development tools - H/w, S/w): STAAD Pro, SAP 2000, MS EXCEL, AUTODESK Revit Architecture, Tekla structures.

Objectives of the project: Design and Detail petrol pump prototype.

Major learning outcomes: Design of steel structure using STAAD pro.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Friendly environment.

Academic courses relevant to the project: Design of steel structures, Design of foundation under dynamic loads, Earthquake engineering.

PS-II Station: Dinero (NeoMercury Innovations Pvt. Ltd.) – Non-Tech, Hyderabad

Faculty

Name: Gaurav Nagpal

Student

Name: EDDULA MOURYA REDDDY (2017B4A41025G)

Student write-up

PS-II project title: Product and marketing analytics

Short summary of work done during PS-II: My role as an Analyst in Dinero was of a generalist, I have learned the basics of conducting data taxonomy and creating dashboards on Firebase and on Power BI. However the most learning for me has been in marketing where I was introduced to a bunch of new skills whether it is creating email campaigns, having a metrics based approach for content marketing, creating budgets and ideating for performance marketing.

Tool used (Development tools - H/w, S/w): Power BI, Firebase, Google Analytics, Excel.

Objectives of the project: To measure the app by creating relevant dashboards and to create KPIs for the different marketing campaigns.

Major learning outcomes: To be able to properly measure a product, create dashboards on Power BI and different marketing campaigns like Email marketing, performance marketing, SEO and content marketing.

Details of papers / patents: Dinero: The case for launching a minimum viable product.

Brief description of working environment, expectations from the company: The working environment was very healthy and that created a fun place for me to be able to learn and contribute in every way I could. The managers were also very patient and made sure all the necessary resources were shared to help me learn. The team is very passionate and it is sure to rub off on you too.

Academic courses relevant to the project: Nil

PS-II Station: Disney+ Hotstar, Mumbai

Faculty

Name: K Venkatasubramanian

Student

Name: ANKIT RAJ (2018A3PS0270G)

Student write-up

PS-II project title: Communication service

Short summary of work done during PS-II: Worked on creating a new microservice using Java as programming language and Spring Boot framework. This new microservice handles the process of sending appropriate communication to a user when a state change in user subscription occurs. We were able to deploy this service in production environment and currently this handles all the communication to be sent in South Africa when a user buys a new subscription.

Tool used (Development tools - H/w, S/w): Spring Boot, Java, Terraform, AWS, GitHub.

Objectives of the project: Create a new microservice.

Major learning outcomes: Learnt about building things from scratch and many good coding practices.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good working environment. Project assigned was a great learning opportunity.

Academic courses relevant to the project: OOP, DSA.

Name: SIDDHARTHA GOSWAMI (2018A3PS0523H)

Student write-up

PS-II project title: Explainable content recommendations

Short summary of work done during PS-II: The project involves a thorough survey of existing techniques in model explainability and the selection of an appropriate technique for our use case requirements which are local-level model agnostic explanations which can be applied to the deep learning recommendation models. Some of the most important techniques studied were LIME, Integrated Gradients, Association Rule Mining, DeepLIFT and SHAP. The next step was the construction of a background dataset for the explainability module using the training dataset of the model, using only 100-1000 samples from the model training set to maintain computational efficiency. Following this, the next step was converting the recommendation model from a Keras subclassing format to a compatible format for the explainer module using the TensorFlow graph. Extraction of feature embeddings from the model input training dataset and the extraction of the relevant list of input and output tensors from the intermediate layers of the model that will give us the feature importance scores were some of the steps involved in the building of the explainability module for the recommendation model. It also involved a study of the inner layers of the deep factorization model used for recommendations and its existing input features to be explained.

Tool used (Development tools - H/w, S/w): Python, Numpy, Keras, TensorFlow, Pandas.

Objectives of the project: The objective of this project is to make use of a model explainability technique to explain the output of the recommendation model for a given content-user input data and determine which are the most important features of our input that led to the recommendations.

Major learning outcomes: Principles of explainability in machine learning and deep learning and their implementation in Python.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The work was online and the working environment is really friendly. My instructor and my mentor were really encouraging and helpful throughout and I was able to learn a lot of new concepts.

Academic courses relevant to the project: Foundations of data science, machine learning, deep learning.

Name: ARPIT RAY (2018A7PS0163G)

Student write-up

PS-II project title: Partner transfer observability

Short summary of work done during PS-II: Currently there are two services - External Catalog Integrations and Content-xfers which enable the transfer of content to partners. We plan to make Kafka Producers publish events from these 2 services to a Kafka topic which will be listened to by the consumers in the service which we will be making. Our service will then push those events to a database. Our frontend service will then interact with our backend service which will fetch the status of different transfers and show it on the dashboard.

Tool used (Development tools - H/w, S/w): Tech stack: Apache Kafka, Kubernetes, Go, Python, Confluence, React, Avro, GoCD, Terraform, AWS, Frontend, Backend, Springboot, DynamoDB.

Objectives of the project: Visibility on content transfers to content ops, hence they shall proactively initiate retransfer if something is not transferred. Share detailed goals and deliverables, build observability around content transfer and collect status of transfer.

Major learning outcomes: Tech stack: Apache Kafka, Kubernetes, Go, Python, Confluence, React, Avro, GoCD, Terraform, AWS, Frontend, Backend.

Team work, Time Management, Presentation skills, Communication skills, Soft skills.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Very good work culture, where everybody is helpful and are always eager to guide us in our work. Mentors provided really great assistance during every point of the internship and always provided advice and resources to carry out the task at hand. Great experience overall.

Academic courses relevant to the project: Data structures and algorithms knowledge was used but the tech stack was different and took some time to get used to company standards.

Name: SHAH KUSHAL SNEHAL (2018A7PS0254G)

Student write-up

PS-II project title: Forensic watermarking

Short summary of work done during PS-II: Added solution to playback service of hotstar to generated unique watermarked streams for every user.

Tool used (Development tools - H/w, S/w): Git, Golang, Python, AWS.

Objectives of the project: To uniquely watermark video content for every user so that tracking is easier in case of leaks.

Major learning outcomes: Back end development and video generation pipelines.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very helpful and approachable seniors.

Academic courses relevant to the project: C++

Name: CHAHAT JAIN (2018A8PS0092P)

Student write-up

PS-II project title: Hotstar EPG/IPG

Short summary of work done during PS-II: Developed the feature of upcoming content on Hotstar.

Tool used (Development tools - H/w, S/w): Node.js, MySQL, HTML, Kafka, React.js.

Objectives of the project: Build Electronic Programming Guide for Hotstar.

Major learning outcomes: Software development, Full-stack development, Database design.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Great environment, Good culture.

Academic courses relevant to the project: DSA, OOP, DBMS.

Name: SAKSHI RAICHANDANI (2018AAPS0468H)

Student write-up

PS-II project title: MultiCDN control panel and dashboard

Short summary of work done during PS-II: Built a dashboard to administer zplay-hotstar's playback system that would manage cons, content, supply maps with increased operational efficiency and reducing manual errors using automated api calls.

Tool used (Development tools - H/w, S/w): S/w: python, flask, sqlalchemy, DynamoDB, react, ant design.

Objectives of the project: Administer zplay easily, reduce operational efforts and avoid manual errors. Improve security by integrating it with SSO. Increase Operational efficiency managing the zplay platform. reduce time in setting up cdns, supply, distribution maps.

Major learning outcomes: Learnt a lot about the various technologies being used in video streaming and the importance and working of CDNs. Got proficient at using new languages and tech stack.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: the working environment for interns is pretty good and the teams and mentors are helpful. The only expectation would be to know your project inside out and deliver results. No fixed office hrs and punch in time so you can work at your comfortable hrs other than meetings.

Academic courses relevant to the project: Software development course.

PS-II Station: Divgi TorqTransfer Systems Pvt. Ltd., - Bhosari (onsite), Pune

Faculty

Name: R S Reosekar

Student

Name: NINAN NEIL EAPEN (2018A4PS0668G)

Student write-up

PS-II project title: Development of Computer Vision based Process Monitoring system or Poka-Yoke

Short summary of work done during PS-II: The PS station assigned two projects to me, the first of which was the cost analysis of cutting tools, this project involved estimating the actual cost of a tool to allow for better footholds during negotiation with suppliers. This went from just cost analysis to actually negotiating with the suppliers, I also had a short project negotiating the price of rust preventive oils. After this, I showed my knowledge of Machine Learning and was assigned with the Computer Vision Process Monitoring System, it involved both machine learning as well as non ML algorithms. Each of these process was attempted, tested and implemented to give the company options for future implementations. After this the code was integrated into a PC and camera module that was set up on the shop floor.

Tool used (Development tools - H/w, S/w): SAP Business One, Excel, Python, OpenCV, TensorFlow.

Objectives of the project: To counter misplacement of components during assembly a Computer Vision application to monitor the proper placement was made and tested using both Machine Learning (ML) based and non-ML based algorithms to learn the efficiency and benefit to the organization.

Major learning outcomes: a. Creating a software suite from scratch is difficult in terms of planning and direction, so it helps to start out by attempting to simulate competition.
b. Testing requires a significant amount of time since on the field there are a number of issues that will appear which wouldn't have been thought of during design.

- c. Creating two or three methods simultaneously helps since there might be different use cases that come up after the first installation which could require a better solution.
- d. Documentation is important not only for bug-fixing it also helps to review the work done and places where code could be optimize and redundant applications.

Details of papers / patents: Since the initial work was done in accordance with company rules there are no research papers for it.

The second project involved the concepts of machine learning and basic line detection, all of which were written in the following documentation, OpenCV I.

Brief description of working environment, expectations from the company: The company placed me in the Purchasing Department initially, this involved a lot of side work alongside my main project. Researching new products, creating presentations based on reports, costing analyses for re-negotiations and negotiations themselves. These day-to-day jobs are expected to be completed within a couple of hours or that day itself due to their urgency, the projects having a longer duration have a fixed date of completion before which it must be submitted or else the supervisor takes over the task. New ideas are welcome however since any change would involve money spent, they require a cost analysis report for the cost as well as the benefit of the change. Since new ideas would also require working out errors and miscalculations, the company typically would choose a more industrially tested and standardized option to remain safe.

Academic courses relevant to the project: Material Science, Production Techniques, Quality Control, Engineering Optimization, Machine Learning.

PS-II Station: Dorsch Consult (India) Pvt. Ltd., Mumbai

Faculty

Name: Pavan Kumar Potdar

Student

Name: RANGAN GHOSH GHOSH (2020H1300078P)

Student write-up

PS-II project title: 1. Maharashtra State Road Improvement Project & Road Safety Audit
2. Approach road for Ro-Ro Jetty, Narangi

Short summary of work done during PS-II: Draft report prepared for Climate Change Adaption, Budget for maintenance cost of the road, Systematic Road Maintenance Program, Road Safety Audit PPT, Calculate Maintenance cost by HDM software, Supervise on field test in Narangi site (Bore hole, Trial Pit, Slump value etc), concreting work, GSB work, Bund Work etc.

Tool used (Development tools - H/w, S/w): HDM 4 software, MS Excel, MS word, MS PowerPoint etc.

Objectives of the project: 1. Improvements of SH & NH in Maharashtra in future to counter the effect of Climate Change. 2. Providing infrastructure at Narangi that are being developed a sustainable water transportation system for city.

Major learning outcomes: HDM Software, Quantity Estimation, Bar Bending Schedule, On field test for soil and concrete, Traffic calculation, Maintenance cost calculation for roads etc.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The internship opportunity I have with Dorsch Consult India is a great chance for learning and professional development. Therefore, I consider myself as a very lucky individual as I am provided with an opportunity to be a part of it. I am also grateful for having a chance to meet so many wonderful people and professionals who are leading me through this internship period. Great place to work and learn a lot of things from this company.

Academic courses relevant to the project: Highway Geometric Design, Pavement Design, Maintenance of Roads, Road Safety Audit, Transportation Economics.

PS-II Station: Doubtnut - Tech, Gurugram

Faculty

Name: Akshaya G

Student

Name: TANYA GARG (2018A7PS0215P)

Student write-up

PS-II project title: Live classes project

Short summary of work done during PS-II: I was responsible for building frontend and backend features, and working on developing and enhancing some APIs for the Doubtnut platform. I worked on revamping the Teachers Channel Page in the Live classes section of the app, and was responsible for including more features on it while enhancing the functioning and performance of the existing ones. Tasks pertaining to backend and frontend development, database development and performance improvisations were all carried out by me for the features I worked on. I also created some scripts which help other APIs in backend processes and with other regular tasks of the team. I was also actively involved in ad-hoc bug fixing tasks.

Tool used (Development tools - H/w, S/w): NodeJS, ExpressJS, Redis, MySQL, AWS, Postman, Docker, GitHub, Jira.

Objectives of the project: Developing new features and enhancing existing ones for the live classes section of the Doubtnut app and ad-hoc tasks pertaining to backend development and maintenance, along with extensive bug fixing.

Major learning outcomes: This internship helped me learn and enhance my full-stack development skills, specially backend development in Node.js and using Redis with Node.js. Creating backend scripts to support backend processes and APIs, finding and fixing bugs in the code, and working on such a huge codebase with such an extensive database equipped me with the necessary skills of code optimization and industry standard code quality practices.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work atmosphere at Doubtnut is great, everyone from the CTO to the team manager and peers are extremely approachable and very helpful. The working timings and the type of tasks you want to work on are very flexible. The startup culture at the company provides a great learning trajectory and promotes a very open and nurturing work environment.

Academic courses relevant to the project: Databases, DSA, OOP.

PS-II Station: Dr. Reddys Laboratories, Hyderabad

Faculty

Name: Bharathi R

Student

Name: PRATIK NAGARAM CHAUDHARY (2020H1080325P)

Student write-up

PS-II project title: Development of differentiated drug product

Short summary of work done during PS-II: Developed differentiated drug product which is bioequivalence to RLD.

Tool used (Development tools - H/w, S/w): RMG, Compression machine, blender.

Objectives of the project: Bioequivalence with RLD.

Major learning outcomes: - R&D work flow

- Learnt various software and equipments of industrial scale
- Project handling and problem solving

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Quite good work culture and good learning.

Academic courses relevant to the project: Totally relevant to courses we had studied.

Name: RITU PAHUJA (2020H1530366P)

Student write-up

PS-II project title: Sponsor Oversight monitoring of clinical trials

Short summary of work done during PS-II: I have been assigned work for 3 projects overall. In project -1 i have to maintain hardcopy of all the documents mentioned in sponsor oversight file and maintain According to sponsor oversight index before the FDA audit also one on-site training was done at hospital related to the project. For project -2 i have been assigned to maintain the

soft copy on share point access, notify the team after uploading and maintain the tracker for that in the Excel sheet. For project -3 which is still in the initial phase, i am helping in site selection, maintaining tracker of questionnaire received from the sites and maintaining all the regulatory documents.

Tool used (Development tools - H/w, S/w): MS excel, powerpoint, word.

Objectives of the project: 1. To make sure all the documents of respective trials are available, 2 To monitor the activities CRO's are doing which have been hired for particular trial, 3. To maintain hardcopy as well as soft copies of the ongoing trials.

Major learning outcomes: 1. Activities of CRA. 2. What are the required activities and documents before, during and after the clinical trials. 3. How to select the site and maintain the tracker for any project.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: The working environment is friendly and helpful, everyone is willing to teach whenever we approach them.

Academic courses relevant to the project: Yes, Clinical Research and QARA are extremely beneficial and relevant with my project.

PS-II Station: Eli Lilly and Company (India) Pvt. Ltd., Gurugram

Faculty

Name: Bharathi R

Student

Name: SAI ANIRUDH K S (2020H1290012P)

Student write-up

PS-II project title: Understanding and writing a clinical study protocol

Short summary of work done during PS-II: I learnt about drug development process and the various documents required one of which is a protocol. During the course of the project, I have written a clinical study protocol.

Tool used (Development tools - H/w, S/w): Microsoft office suite.

Objectives of the project: To understand clinical trials and to write a clinical study protocol.

Major learning outcomes: Writing regulatory documents related to drug development.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: A friendly working environment, very supportive members who are patient in teaching. Delivery of tasks on time is expected by the company leadership. The tasks should be performed with accuracy and punctuality.

Academic courses relevant to the project: Molecular Biology.

PS-II Station: Eltropy, Bengaluru

Faculty

Name: K Venkatasubramanian

Student

Name: M S NANDAN (2017B4A70657G)

Student write-up

PS-II project title: Web development At Eltropy

Short summary of work done during PS-II: I worked on both backend and frontend development tasks. The tasks were either bug fixes or optimizations of the existing product.

Tool used (Development tools - H/w, S/w): PostgreSQL, Golang, Grails, React, Jira, Git.

Objectives of the project: To fix bugs, improve and optimize the Eltropy application to improve performance and user experience.

Major learning outcomes: Web development, software development tools and practices, scalability of applications.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Teammates are helpful and supportive. There were no fixed work timings as the primary expectation was to complete the given tasks on time. Interns are treated like full time employees and are involved in most discussions.

Academic courses relevant to the project: Object Oriented Programming, Database Systems.

Name: SAI SATVIK VUPPALA (2017B4A71449H)

Student write-up

PS-II project title: LINE WORKS Integration with Eltropy

Short summary of work done during PS-II: I worked on integrating Eltropy with LINEWORKS, a message sharing platform popular in Japan, my tasks included both the frontend and backend development part of it. To be specific this has been used to share the documents stored in Eltropy to the customers on LINE and obtain analytics and insights for sales enablement use cases.

Tool used (Development tools - H/w, S/w): MongoDB, postgresSQL, GoLang, GIT, React, Groovy, Grails, Jenkins.

Objectives of the project: The objective was to integrate Eltropy with LINE (famous message sharing platform in Japan), for a sales enablement use case.

Major learning outcomes: I got hands on experience to work directly on the product, though I was new to GoLang and React, I have picked it up and my own pace and I could contribute to the projects. Working in a team we would not only learn the technicalities that are faced but also we get to learn how things are handled under pressure.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: I was completely new to software development, so I had a lot to learn, the team here has been pretty supportive and approachable and created an environment of learning easier. That said they never treated me as an intern I got to work with the direct product from my first task, every small idea/suggestion is taken under consideration. The company expects us to take responsibility and deliver.

Academic courses relevant to the project: DBMS, OOPS, Software Engineering.



PS-II Station: EXL Service Pvt. Ltd., Gurugram

Faculty

Name: Pradheep Kumar K

Student

Name: VIKAS (2020H1420194P)

Student write-up

PS-II project title: Synthetic Data Generation and Metadata Generation

Short summary of work done during PS-II: Project was mainly focused on Synthetic data generation.

Tool used (Development tools - H/w, S/w): Python, Excel

Objectives of the project: The objective of the project is to explore synthetic data generation libraries, tools, and techniques. After generating the data, a collection of metrics and tools allow you to compare the real that you provided and the synthetic data that you generated.

Major learning outcomes: Gained exposure to the area of synthetic data generation.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: My team had one of the best work-life balance and cordial environment. Very conducive environment for learning new things outside of your domain. Supportive manager and mentor. Interns are treated as full time employees. Interns have complete responsibility of their projects and get to try new ideas.

Academic courses relevant to the project: Not taken any Coding/ML electives in university. Had prior knowledge in ML, Time series forecasting.

PS-II Station: Faurecia, Gurugram

Faculty

Name: Nithin Tom Mathew

Student

Name: KESARKAR MANDAR NILESH (2020H1060143G)

Student write-up

PS-II project title: Static stiffness enhancement of door panel using OptiStruct optimization

Short summary of work done during PS-II: The solver OptiStruct was used in HyperWorks environment to optimize different aspects like topology, topography, size etc for automobile parts. Firstly, the basic methodology and procedures for CAE was understood. Then proper understanding of the particular solver was done. Project problem was introduced and comprehended. Different simulations were launched by altering different parameters. After all the simulations were executed, a comparison study about the feasibility and manufacturability of different designs was done and the best was recommended. Later on, a standard guideline of optimization was constructed along with examples / demos for the entire CAE team here at Faurecia, Pune.

Tool used (Development tools - H/w, S/w): HyperWorks (v.2021).

Objectives of the project: Enhancement of stiffness of an automobile door panel and writing a guideline for optimization.

Major learning outcomes: Learnt industrial CAE methodology, execution of projects. Application of FEA, writing standard guidelines.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Very friendly work culture and a healthy environment. Initial learning was steady and all seniors and managers were helpful in case of any queries. Everyone is reachable.

Academic courses relevant to the project: FEA

Name: ASHWIN KUMAR DEVANAND PARKHI (2020H1060203P)

Student write-up

PS-II project title: To automate static standard Excel file to optimize material characterization process

Short summary of work done during PS-II: For one material characterization, 20 hours were being allocated. After the excel automation, the same work can be done in 8 hours. In material characterization, the slopes in the stress strain curve needs to be increased in positively incremental order to avoid the negative slopes in the curve(also known as necking). As the solver does not support the negative slopes, the simulation model becomes unstable and will not converge. This manipulation of slopes was done manually initially, but now with the excel automation in vba the built logic helps to do the same procedure in more easy way.

Tool used (Development tools - H/w, S/w): VBA in Excel, Hyperworks, HyperView.

Objectives of the project: 1) Understand the characterization procedure, learnt visual basic for application in Excel, built a logic for the iterative process of characterization and built a graphical user interface to reduce the time for material characterization.

Major learning outcomes: 1) Learnt to characterize a material for FEA analysis
2) Learnt to code in VBA
3) Learnt to extract midsurface, geometry cleanup, 2D meshing, built connections and its types
4) Static and modal analysis
5) Learnt the basics of TCL (tool command language)

Details of papers / patents: None

Brief description of working environment, expectations from the company: Mentor and colleagues were supportive, was given enough time to learn and complete the project task.

Academic courses relevant to the project: Finite element analysis.

Name: AKANSHA SINGH (2020H1480304H)

Student write-up

PS-II project title: Wiring harness and thermal decoupling for Electrically Heated Catalyst (EHC)

Short summary of work done during PS-II: Initially, I was introduced to the generic training in the simulation tools. The project assigned to me was based on the training and availability. It was a good project and I learnt a lot from it.

Tool used (Development tools - H/w, S/w): Hypermesh, Star CCM+, TAITherm.

Objectives of the project: Comprehensive parametric analysis on the different components of wiring harness includes lug, cable and core to numerically predict the skin temperature.

Major learning outcomes: 1. Product knowledge - Vehicle emission basics, automotive exhaust system and its components.

2. Got familiarized with different simulation tools such as HyperMesh, Star CCM+ and TAITherm.

3. Weekly review meetings helped me to improve my communication and presentation skills.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Flexible work environment where the members of the team have a strong sense of camaraderie and a good work ethic. Company culture is challenging and yet motivating. All the employees and teams work well together cross- functionally to accomplish their goals. My expectations from the company would be providing the working environment where I display a strong personal commitment to complete a project and demonstrate strong verbal and written communication skills to help the company achieve its objective of serving its clients more effectively.

Academic courses relevant to the project: Heat transfer, Automobile engineering.

PS-II Station: First Meridian - OnSolve LLC, Bengaluru

Faculty

Name: Febin A Vahab

Student

Name: AMIN DARSHAN SUNILKUMAR (2017B1A40777H)

Student write-up

PS-II project title: Various assurance projects at First Meridian - OnSolve LLC

Short summary of work done during PS-II: Worked with developer teams to test out the features in regular ongoing sprints.

Tool used (Development tools - H/w, S/w): VS Code, IntelliJ Idea, Eclipse, Docker, Lens.

Objectives of the project: Executing various projects at OnSolve.

Major learning outcomes: Learnt about various development processes at OnSolve.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good work culture, adequate time provided for learning.

Academic courses relevant to the project: DSA, OOP, ML.

Name: GOURI KARTHIK GEMBALI (2018A1PS0038H)

Student write-up

PS-II project title: Quality assurance and testing for OnSolve risk intelligence product

Short summary of work done during PS-II: Firstly I was provided basic training of around 1 month with Java, Selenium, mySQL, UI and API Testing using online resource material selectively chosen by the mentor. I have been given all the required accesses for the software tools required and also the administrative accesses of OnSolve product to be worked upon. At the end of the training, I have given a demo to my mentors and leads on few assignments given to me. After the training, I was assigned to a scrum team which work on the Risk Intelligence product of OnSolve. Along with this basic training, I was specially trained with the Software Testing Life Cycle and the QE testing strategy followed at company. From then I started involving in all the scrum activities like grooming sessions, sprint planning, standup calls, etc as a QA Intern (Testing). This helped me in getting accustomed to the Agile working methodology. I had a mini training period again

based on Jira tool, Gitlab (& Git), qTest management tool for writing and maintaining the test cases of feature testing and Katalon Studio for UI and API automation testing of the test cases. These are the latest tools required for QA process and my Manager, QA Lead have helped me a lot in learning these new tools. By the end, I was able to perform good amount of work from the QA side. I developed many test cases, manually tested them on the product application and also performed automation testing successfully. By the end of sprints. I was able to give demos of my work done. With respect to PS-II, I had quizzes for required knowledge on company, Group discussions and Seminar presentations of the work done at the company. Overall it was a good learning and working experience.

Tool used (Development tools - H/w, S/w): Software tools used: Eclipse IDE, Postman, qTest management tool, Katalon Studio, Jira tool and Gitlab.

Objectives of the project: Quality Assurance and Automation Testing for the Risk Intelligence product from OnSolve.

Major learning outcomes: Trained with Java, Selenium, mySQL, API testing
Worked using Agile methodology as part of scrum teams
Software testing skill in both manual and automation

Details of papers / patents: Not applicable

Brief description of working environment, expectations from the company: The internship was conducted remotely due to the pandemic. So, the onboarding sessions, training sessions, work done and evaluation components as part of PS-II were done completely in Online. This company is a good place to start off your career with good learning and work experience in the IT industry. This is the first time our institute associated with company and it is the first time for company too in offering the internship. So, the employees and leads there, have taken special responsibilities in providing good training for us and only that learning is what all they expected from interns. But surprisingly, we were able to involve deep into their work procedure with their guidance and good results were delivered to the company as well. The working environment is too good from their side and it was so smooth to get trained and work in the service they provided for this internship. And another important benefit is the good stipend amount they pay us. Finally,

it is a good experience to have done my internship at OnSolve and I recommend everyone who is interested in IT to join for internship at OnSolve.

Academic courses relevant to the project: Not Applicable

PS-II Station: Flipkart (Software Development), Bengaluru

Faculty

Name: Vineet Kumar Garg

Student

Name: SWAPNIL AGARWAL (2017B3A71343H)

Student write-up

PS-II project title: Vector search

Short summary of work done during PS-II: I developed the search feature based on Hierarchical Navigable Small World Graphs, where the user query's intent is extracted, and the closest semantically matching products are given out in real-time.

Tool used (Development tools - H/w, S/w): Solr, JAVA, Python, Postman.

Objectives of the project: Develop a searching technique on Solr, which would utilise the user's query intent and efficiently fetch the closest semantically matching products for the user in real-time.

Major learning outcomes: The project helped me learn about the caveats and scope of advancement in how search engines work for large-scale data.

Details of papers / patents: <https://arxiv.org/abs/1603.09320>

Brief description of working environment, expectations from the company: Work-life balance is good. No official office timings; you can set your timings to work based on your workload. Colleagues are understanding and helpful. Everyone is willing to help you with any kind of blocker.

Academic courses relevant to the project: Object Orient Programming, Data Structures and Algorithms, Computer Networks, Machine Learning.

Name: KOTIKALAPUDI VENKAT KARTHIK (2017B4A70927H)

Student write-up

PS-II project title: Dmux enhancements

Short summary of work done during PS-II: The work mostly focused on adding features which were already decided. They had to be implemented. The first was related to tracking various metrics to improve observability ex- offset at source, destination, system metrics etc. The second task was to ensure resilience which had three sub tasks first one was to implement a circuit breaker to give sufficient time to the sink. The next was to implement throttling where the source had to be choked whenever there is too much lag and the next was config hot reload where config changes had to be reloaded at run time itself and the final task was to add filters for traffic monitoring and to look for alternate sources and libraries to deal with the existing memory related issues.

Tool used (Development tools - H/w, S/w): Golang, K8s, Python, Helm Charts, kafka.

Objectives of the project: The objective is to deal with problems in the existing version of Dmux (Which is Flipkart's stream processing platform) by adding various features.

Major learning outcomes: Learnt Golang which is a completely new language for me and used it to implement the features to the existing version. Stream Processing platforms was something that I did not know earlier. Also learnt how to deploy this with few new features with other platforms as tenants on K8s.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was really good. The mentor and the senior members of the team were really helpful and constantly provided guidance. They suggested to take up different tasks and work in parallel just in case I am blocked on something I would be able to continue with other tasks without wasting time. Had regular meets to discuss the project and issues. The team members too were super helpful. Whenever we face an issue it is expected that we communicate with others members of the team and resolve the issues. Learnt a lot of things by working along with them.

Academic courses relevant to the project: DSA, OOPS, Computer networks, Software Eng.

Name: AMAN TAYAL (2020H1030068G)

Student write-up

PS-II project title: Payment

Short summary of work done during PS-II: I did following work during PS: Developed an understanding of the flow via the code. Identified leakages in the flow and provide solution. Upgraded the API's error message. Wrote python script. Scheduled python Cron. Environment setup for NFR. It means that I setup the server for the NFR purpose. Basically NFR stands for non functional requirement. Actually for all the API's we have to perform NFR testing. So we need seperate servers so I setup those servers. Mapped K8's pod behind ELB. Actually someone else

setup the k8's pod but I mapped those pod behind the ELB. ELB stands for elastic load balancer. Basically all the request related to service comes to ELB and then ELB send those request to the pods based on resource availability on the pods. Removed two flag from the system.

Tool used (Development tools - H/w, S/w): H/w- Mac Book S/w- IntelliJ, jenkins, java, python, K8's.

Objectives of the project: Project is dedicated to supplying and handling COD order processes, as well as ensuring that consumers have a positive experience while making payments at their doorstep. The goal of this project is to assist a variety of different tasks, such as verifying the entry

Major learning outcomes: I will explain major learning outcome through the following point:

First thing I learnt is how to work in corporate world. This includes how to communicate with team and how to cooperate with the team and process further for completing the task.

Second thing I learnt is how the SDLC (s/w development life cycle) follow in the industry. Actually there were lots of meetings which I attend through out the internship & these meetings are the part of SDLC method called Agile method. So I closely monitored how SDLC follow in the industry Apart from this, I learnt number of tools and technologies such as,

From JEDI program I learnt: Oracle VM Virtualbox, Linux, Git, GitHub, Codebunk, Draw.io, Lucidchart, Eclipse, IntelliJ, Postmam.

From Project I learnt: Jenkins, Spring Boot, Python, Cron Job, Kafka, K8's.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment of the company is very good as all the teammates and senior are very helpful. Work life is also good at flipkart. People belongs to other team are also very kind and supportive due to which there is very good environment for working. From flipkart you can expect that you get ample amount of knowledge about different technologies and concepts. I myself learned alot during my internship and expecting that same will be continue in future too. We can say working environment at flipkart is very good as well as you will get lot of learning from the company.

Academic courses relevant to the project: Yes

PS-II Station: Flipkart Internet Pvt. Ltd., - Business Analyst, Bengaluru

Faculty

Name: Gaurav Nagpal

Student

Name: PRATYUSH SRIVASTAVA (2018A1PS0930G)

Student write-up

PS-II project title: Machine Learning Propensity Models for Personalized Targeting

Short summary of work done during PS-II: So I made 4 Browser and 1 Non Browser model for personalized Targeting. Browser model takes last few days browsers into consideration and predicts the users who are most likely to convert in the next few days along with the type of product they may purchase. Similarly Non Browser model also does the same thing except that it takes into account all the users who have purchased in last 12 months and have the probability to buy again in next 15 -20 days. This helps the organization to do better and personalized targeting and this model generated can also be used to distribute various offers and schemes to more loyal customers.

Tool used (Development tools - H/w, S/w): Machine Learning Algorithms, Python (data analysis), SQL, Excel.

Objectives of the project: To make machine learning models which would be used to target at more personalized level through the banners at Flipkart app and websites homepage.

Major Learning Outcomes: Machine Learning Algorithms, Python (data analysis), SQL.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working env. is pretty good ,people are very kind and helpful.The timings are flexible and the managers and directors are understanding in nature. Expections from the company is that we do our work on time with utmost sincerity and diligence.

Academic courses relevant to the project: NA

Name: KALIDINDI VINEETH VARMA (2018A4PS0355H)

Student write-up

PS-II project title: Analysing the product page NPS responses and deriving key insights

Short summary of work done during PS-II: There's a survey that's being done on the product page and I had to analyse the responses. I had to first understand the data and using NLP, I trained a model which detected and removed spam. Then, using the same technique, tried to detect the sentiment (positive / negative) of the responses. Then using the keywords used by the customers, the responses were tagged into various concerns like delivery, images, price, etc., I, then had to analyse the tagged responses at different Business levels and derive actionable insights. These insights were then presented to Stakeholders (product team in my case) and Action Items were defined.

Tool used (Development tools - H/w, S/w): SQL, Python, MS-Excel.

Objectives of the project: Analysing the product Page NPS responses and deriving key insights.

Major learning outcomes: Technical Tools such as,

1. SQL - Learnt to write efficient queries
 2. Python - Natural Language ToolKit
- Analytical skills

1. Structured Thinking - how a problem statement needs to be approached

Details of papers / patents: None

Brief description of working environment, expectations from the company: Ours was a completely remote internship. The work doesn't have any timings or deadlines. A lead/buddy was allotted and I used to report my progress to her. After, considerable progress, we used to take it to the Manager and then present it to our stakeholders. My Team was very friendly and helpful.

Academic courses relevant to the project: None

PS-II Station: Flipkart Internet Pvt. Ltd., - Business Development, Bengaluru

Faculty

Name: Vineet Kumar Garg

Student

Name: UTKARSH DIXIT (2017B1A10403P)

Student write-up

PS-II project title: Category management

Short summary of work done during PS-II: It had two parts: Day to day tasks of updating and maintaining trackers and scendindly intervention related initiatives where you would bring your creativity to change anything and everything to bring results.

Tool used (Development tools - H/w, S/w): SQL, Excel, Omniture.

Objectives of the project: Grow the mens categories in terms of units and conversion.

Major Learning Outcomes: Stakeholder management, strategy, people operations, data analysis.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Good work life balance.

Academic courses relevant to the project: None

Name: ARYAN CHAUDHARY (2017B5A41588H)

Student write-up

PS-II project title: BGMH Traffic growth, affiliate marketing & DP automation

Short summary of work done during PS-II: 1) BGMH traffic growth: Root cause analysis was done to identify what is contributing to moderate growth in traffic. To identify trends across search, merchandising & recommendation channels, S.O.T analysis was carried out for the past two years along with YOY traffic growth projections to identify which channel is driving traffic growth 2) Affiliate marketing: The goal was to identify & onboard two dedicated influencer agencies which will drive affiliate campaigns for BGMH & also prepare a detailed submission on how to leverage affiliate influencer marketing, key metrics to tracks, performance analysis and recommendations for improvements, ROI framework & optimum campaign model to determine split between deliverables & influencers 3) Under DP (demand plan) automation, I was assigned to update weekly, map the planning process & identify key pain areas where automation can be brought in to simplify the overall process.

Tool used (Development tools - H/w, S/w): Google services (sheets, slides), Omniture & FDP.

Objectives of the project: 1) BGMH traffic growth: Objective was to perform RCA & identify reason behind moderate traffic growth in past 6 months 2) Affiliate marketing: Objective was to onboard 2-3 dedicated influencer marketing agencies who will drive future affiliate campaign.

Major learning outcomes: BGMH traffic growth:

Learnt about different channels of traffic such as search, merchandising, CRM, etc

Learnt about different strategies which can improve traffic such as BBNB, city wise targeting, etc

Affiliate influencer marketing:

Learnt about different types of influencers & assets prepared by them

Learnt about the whole planning process that goes into taking a campaign live

Learnt about different teams & their role in taking a campaign live

Learnt about metrics we can track in marketing campaigns

Learnt about how theme & deliverables for a campaign are determined

DP automation: Learnt about demand plan & metrics we track in E-commerce

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is great. You get to work with different team & understand working & daily tasks of these teams which at the end are essential for constant growth & identifying improvement area for Flipkart. If your work is good you can freely speak & put up your ideas in front of leadership.

Academic courses relevant to the project: Supply Chain Management & Engineering Optimization.

PS-II Station: GE Healthcare, Bengaluru

Faculty

Name: Suparna Chakraborty

Student

Name: NEDUNURI SAI CHARAN (2020H1120281P)

Student write-up

PS-II project title: Data Enrichment and Management in Edison Data Lake

Short Summary of work done during PS-II: Developed Python SDK for the APIs, worked on identifying API Gap for the latest UI of the company that is being enhanced.

Tool used (Development tools - H/w, S/w): AWS, CLI, FLASK, Python, Visual Studio GIT BashCode, Postman.

Objectives of the project: Identification of Personal Health Information from Patient Electronic Medical Records, Pre processing the data, making it available for companys internal use.

Major learning outcomes: Learnt how data is managed and utilized for companies internal purposes for design precision, taking strategic decisions for a massive organization like GE healthcare, which has lots of patient data generated on its medical devices.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Very supportive team, ready to help, working on latest technologies, trying to develop latest applications for the company.

Academic courses relevant to the project: Network Programming, Cloud Computing, Software Engineering.

PS-II Station: GE India Technology Centre, Bengaluru

Faculty

Name: Paramesw Chidamparam

Student

Name: ANKITA DASH (2020H1060257H)

Student write-up

PS-II project title: 1. Exploration of new technology for gas turbine noise attenuation
2. Support the development of the internal engineering application (using Ansys ACT application programming interface) focused on the mechanical integrity analysis of the water-cooled cond

Short summary of work done during PS-II: 1. Exploration of new technology for gas turbine noise attenuation - Noise attenuation in gas turbines is necessary for the proper functioning of the gas turbine. Parallel baffle silencers have been used for ages for the above reason. But silencers have issues of pressure drop due to the blockage of air by the baffles hence new techniques are needed. Reduction of the area is one of the effective methods to reduce noise by bringing the walls closer, so the filter house now acts as a silencer itself. Side branch resonators can also be used to reduce noise attenuation by connecting a volume through an orifice to the duct. Moreover, expansion chambers also provide the sudden disturbance in the path of sound that forces it to reflect, in a way decreasing the intensity of the sound wave. All three methods have been compared theoretically and numerically to obtain their feasibility. 2. Support the development of the internal engineering application (using Ansys ACT application programming interface) focused on the mechanical integrity analysis of the water-cooled condensers. The Water-Cooled Condenser (WCC) consists of numerous sub-components and parts. Its hearth is the so-called “tube bundle” (a special stack of thousands of tubes), where actual heat exchange occurs. One of the challenges, during the preliminary stage of the engineering process, is to provide accurate

inputs to civil engineering, which is responsible for the design of the foundation for the condenser. This preliminary analysis is done in a commercial software called Ansys. Ansys is a computer-aided engineering simulation software used for product design, testing, and services. The disadvantage of the numerical simulation is, that it takes up a lot of time for meshing, geometry defeaturing, and solving analysis. The whole process can be automated using simulation wizards which are created using the ACT (Ansys Customisation Tool). This project basically deals with the interaction between the excel and the simulation wizard. The Microsoft excel module was designed in such a way that has functioned with a lot of features that can help in extracting the results directly to a predefined template spreadsheet. Moreover, it can also serve as validation of the design parameters (e.g., mass, loads on specific supports, the center of gravity, etc.).

Tool used (Development tools - H/w, S/w): Ansys ACT, Ironpython, Visual Studio, Microsoft c#.

Objectives of the project: 1. Exploration of new technology for gas turbine noise attenuation- The parallel baffle silencers are conventionally used in inlet and exhaust systems to reduce the Gas Turbine noise to a normal audible range or to meet the project-specific requirement.

Major learning outcomes: 1. Acoustics basics 2. Basic functioning of gas turbines, combined cycle plant 3. Noise attenuation techniques 4. Ansys ACT 5. Simulation wizard 6. Condenser types and basics.

Details of papers / patents: Publishing of company related stuff is not allowed.

Brief description of working environment, expectations from the company: Experience GE has an extremely nice environment to work with. It has immense resources to learn as it is an age old industry. Moreover the work culture is also very good as there is no influence of hierarchy in the office. Everyone is available for doubts and there was no question that went unheard. All in all it was an amazing experience to learn from the bests in the turbine industry.

Expectation: It would have been great if live projects would have been allocated but due to IP issues only research and product development type project were allocated.

Academic courses relevant to the project: Acoustics, Machine Design, Stress and Strain.

Name: AKHIL S SATRASALA (2020H1410081G)

Student write-up

PS-II project title: Reasons for failure of Piezoelectric sensors and a few mitigations

Short summary of work done during PS-II: Started of working on the literature survey to find the cause of the failure of the sensors. Started analysing different approaches that can be taken to solve the problem statement. Performed virtual analysis to validate the approach taken. Suggested the company few mitigations.

Tool used (Development tools - H/w, S/w): NX - Unigraphics, ANSYS - APDL, ANSYS Workbench, Flow simulator.

Objectives of the project: RCA of the reduction of the life span of the sensors and develop a solution to increase the life span.

Major learning outcomes: Design, analysis and communication.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Working environment is friendly and smooth. The timings are flexible and nobody is a watchdog. The whole idea is to finish the job given in a specified period of time.

Academic courses relevant to the project: CAED, CFD, FEA.

Name: DEEPTI SANTOSH SONI (2020H1480287H)

Student write-up

PS-II project title: Techno-economic framework development of post-combustion carbon capture (PCCC) in natural gas combined-cycle plant

Short summary of work done during PS-II: This internship work describes about carbon capture techniques and cost analysis which is done, on which I have worked for 5 months of internship. The project title is techno-economic framework of natural gas combined-cycle plant with post combustion carbon capture. This is research work which is continuously going on in company in order to mitigate carbon emission to atmosphere. During this internship I studied about carbon capture techniques. After that I have created excel based tool to do cost analysis for different carbon capture technique.

Tool used (Development tools - H/w, S/w): Excel and ASPEN.

Objectives of the project: 1. Exploring existing literature for the different processes involved in PCCC for NGCC plants. 2. Creating excel based techno-economic model to capture cost and sensitivities associated with the implementation of post-combustion carbon capture.

Major learning outcomes: 1. Post-combustion carbon capture technique and cost analysis.
2. ASPEN modeling.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment of the company is very inclusive. The company is oriented toward teamwork, and career progression. People here are friendly and helpful nature. You will be expected to learn as much as you possibly can while your work. They expect us to build strong networking and talk to people about what type of work they are doing.

Academic courses relevant to the project: yes

PS-II Station: Genpact, Bengaluru

Faculty

Name: Vimal S P

Student

Name: TUSHAR YADAV (2016A5PS0932P)

Student write-up

PS-II project title: Non-trade deduction analysis and supply chain enhancement

Short summary of work done during PS-II: Learnt about the functioning of non-trade team of Unilever and how the team functions and co-ordinates to handle customer complaints, maintain records and resolve issues. The next part of the project deals more with data science to make predictive models and understand the reason for returns and refusals to narrow the losses of the company.

Tool used (Development tools - H/w, S/w): Python, SAP, Excel.

Objectives of the project: To understand the various problems in supply chain management like shortages, overages, damages, returns and refusals. To model enormous supply chain data and apply machine learning and probabilistic models for predicting upcoming issues and pin point specific mistakes.

Major learning outcomes: Applied previous coding learnings to real world datasets and handling big datasets.

Worked with a team and writing understandable codes so that other can work upon it smoothly.

Model deployment in Azure.

Learnt about the mathematics behind ML models and choosing appropriate models.

Improving communication and time management skills.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The company had work from home policy for interns during current PS-2. The working environment is good and colleagues are supportive. Genpact is in the business of outsourcing which brings in new problems to solve in IT sector and is a highly learning process.

Academic courses relevant to the project: Python, Computer Programming.

Name: VISHWA VIJETA (2018A1PS0923G)

Student write-up

PS-II project title: Non-trade deduction analysis and supply chain enhancement

Short summary of work done during PS-II: Genpact provide a range of business and technology services designed to drive digital transformation, innovation, and growth for clients. Client is Unilever America. Unilever is FMCG (Fast-moving consumer goods) sector, on a very large scale sometimes products delivered / customer pick up some received item is damaged example in cosmetic product, melting of ice cream or shortages than actual no of items ordered or overages. For check whether the OS&D claims buy customer is valid / genuine or not or deduction in payment by customer is true or not. It is done by Genpact non-trade cash application team. For this auditor role is most important. This is manual process. To overcome / reduce OS&D (Overages Shortages Damages), we use machine learning model. Sometimes a loading from particular ware house leads to shortages or transport by a particular carrier have damaged product or particular customer request claim for shortages and damages. To overcome this we use previous data to predict results.

Tool used (Development tools - H/w, S/w): SAP, HRC(Highradius), Excel , Python, Microsoft Team, Citrix Workspace, E4score.

Objectives of the project: To understand the various problems in supply chain management like shortages, overages, damages, returns and refusals. To model enormous supply chain data and apply machine learning and probabilistic models for predicting upcoming issues and pin point specific issues.

Major learning outcomes: Learnt about the procedures of supplying products from warehouse to vendors in the non-trade team.

Learnt about data pre-processing and cleaning using Python libraries.

Learnt about various machine learning models and how to choose a particular model based on problem statement.

The functioning of non-trade team of Unilever and how the team functions and co-ordinates to handle customer complaints, maintain records and resolve issues. The next part of the project deals more with data science to make predictive models and understand the reason for returns and refusals to narrow the losses of the company.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Genpact provides technical solution to various big companies in supply chain, FMCG, banking, IT. The solutions to these problems need to be constantly evolved and there is a lot of scope of improvement and experimentation. The domain in which Genpact works has a lots of scope for further collaborations. Genpact provides outsourcing to a lot of companies and that means new problems are encountered constantly; so a lot of scope for further research intern as well as employees to solve problems and learn new things. Very friendly and cooperative environment.

Academic courses relevant to the project: NA

Name: ADITI BAHADUR VASU (2018A3PS1104P)

Student write-up

PS-II project title: Logistics claims analysis

Short summary of work done during PS-II: Used python and microsoft excel to find patterns in faulty shipment data, then created a machine learning model using Random Forest to predict the future success rates of these shipments. Bayesian probabilistic analysis, aggregated pivot tables on Microsoft Excel, and several machine learning concepts were utilized in this project. We also modeled data using Microsoft Power BI in order to analyze trends in customer behavior.

Tool used (Development tools - H/w, S/w): Jupyter Lab, Microsoft Excel, Microsoft Power BI.

Objectives of the project: To identify problematic combinations of various logistic factors in the shipment process for one of India's largest FMCG companies, to reduce the number of claims being filed and increase the efficiency of product delivery.

Major learning outcomes: Concepts in data analytics, probability and statistics and machine learning.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The manager and co-workers were very welcoming and helpful, all around good environment.

Academic courses relevant to the project: Neural Networks and Fuzzy Logic, Probability and Statistics.

Name: SAKSHI SHUKLA (2020H1080313P)

Student write-up

PS-II project title: Supplier scorecard and inventory management models

Short summary of work done during PS-II: The internship project was focused on Unilever's supply chain business with a focus on clients in Australia and New Zealand. Supply chain management refers to the management of a product's or service's full manufacturing flow, from raw materials to delivery of the end product to the customer. There was a realistic understanding of supply chain management. the process of creating key performance indicators (KPIs) that can be used to evaluate supplier performance at the industry level. The project's goals were divided into two categories. The first was to construct a supplier scorecard based on timeliness and fulfillment percent, and the second was to review the inventory management model, which included reviewing all supply data, safety stock, when and how much to order, and so on. All of the project's theoretical and practical components have been addressed in the project report. Supplier performance measures have been identified and a scorecard has been developed. Reviewed existing IPM (Inventory Planning and Management) used by the company. Tried implementing new inventory management models for better inventory. IPS and MEIO have been shared as new functionalities.

Tool used (Development tools - H/w, S/w): Excel / Kinaxis.

Objectives of the project: 1) To measure supplier performance based on timeliness and fulfillment % and create a supplier scorecard. 2) To review the inventory management model i.e., review all the supply data, safety stock, when and how much to order, etc.

Major learning outcomes: • A realistic understanding of supply chain management

- Develop key performance indicators (KPIs) that can be used to assess supplier performance at the industry level
- Practical experience in creating a supplier scorecard
- Discover the value of inventory and how to manage it
- Inventory management software comprehension
- Working experience in a business environment

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was quite good. Everyone including seniors and managers were helpful inspite of

their busy schedule. Work load could be more if you are an employee but for interns it was quite balanced.

Academic courses relevant to the project: No

Name: PATEL DHANASHREE GYANESH (2020H1460350P)

Student write-up

PS-II project title: Process mapping and automation

Short Summary of work done during PS-II: First of all, I was expected to understand client company and its work flow and operations. Then i started learning simple Microsoft power apps. I also learned lean and six sigma principles. Then I was allotted with error-logs and mapped the process. At the end step the entire process was analyzed and process was automated and improved using lean principles.

Tool used (Development tools - H/w, S/w): MS-Excel, MS teams, Power automate, MS Visio.

Objectives of the project: Detailed process mapping on all the processes and using Power automate to deliver successful operation reports.

Major learning outcomes: Experience of working in professional environment.

Importance of good communication skills, teamwork and planning and execution of work operations.

How deadlines are set and project works are completed.

Learnt MS-excel, MS Visio and Power automate, Lean principles and improvement of operations.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The experience of working for a company like Genpact was overwhelming. Every member of the organization was

helpful through out the project. The best part about working in such multinational company is that one can interact with a large number of experienced people, getting an opportunity to learn about wide range of topics. Also the seniors guide us with each and every step and help us to learn new softwares, etc.

Academic courses relevant to the project: Bio-statistics, Pharmaceutical management.

PS-II Station: Goldman Sachs - Investment Banking, Bengaluru

Faculty

Name: Sidharth Mishra

Student

Name: SHAH RAHIL HIMANSHU (2017B4A70446G)

Student write-up

PS-II project title: Investment banking deals

Short summary of work done during PS-II: Due to confidential nature of work, we were asked to sign an non disclosure agreement pursuant to which can not go into the specifics of the deals and the work done. Broadly speaking, It involves below verticals:1. Market Research and Reading
2. Client servicing
3. Live Deals from Pitch stage to Execution.

Tool used (Development tools - H/w, S/w): Bloomberg, Eikon, Reuters, Excel, PPT, Capital IQ, S&P, Moody's, Fitch.

Objectives of the project: 1. To assess debt financial markets and various paradigms that affect it 2. To service clients with in-depth analysis 3. To lead and work on execution of live deals.

Major learning outcomes: 1. In-depth understanding of structured financing products, plain vanilla financing and associated corporate derivatives.
2. Soft skills were improved greatly as a result of being allowed to lead deals and were across clients, banks and other associates across different deals.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Extremely competitive, high pressure environment which is allayed by the fact that you work around brilliant minds. 14 hours a day is the norm and mistakes are expected to never be repeated. Quick learning and self initiative are critical to advance yourself.

Academic courses relevant to the project: Business Analysis and Valuation, Fundamentals of Finance, Financial Management.

PS-II Station: Google India, Bengaluru

Faculty

Name: Y V K Ravi Kumar

Student

Name: ANERI JAIN (2017B4A30759P)

Student write-up

PS-II project title: Evaluation of advanced fault models

Short summary of work done during PS-II: Cell aware ATPG evaluation on an advance technology node:- 1. Spice extraction and UDFM generation 2. Comparison of defect matrix across different extraction corners, drive strengths, load capacitance, distance filters and PVT conditions 3. Defect coverage analysis - static vs dynamic 4. ATPG experiments on a test case - Dynamic Integration of UDFM models in toolkit Interception of ATPG methodology in production flow || Evaluation of new defect oriented test methodologies using Tessent:- 1. Evaluate interconnect & cell neighborhood bridge/open defect detection methodology 2. Comparison of coupling vs layout based bridging ATPG using testcase 3. Critical area aware ATPG experiments 4. Interception of ATPG methodology / flows in production.

Tool used (Development tools - H/w, S/w): Tessent, TestMAX, Tessent-CellModelGen, AFS, Calibre, Python, TCL, Perl, Shell, linux.

Objectives of the project: Interception of logic test using advanced fault models such as cell aware test, bridging etc. on latest technology in an effort to achieve significant reduction in DPPM and high quality test screening at production.

Major learning outcomes: Technical: DFT, CAT, DOT concepts and terminologies, cell aware test ATPG flow, bridge, open and neighborhood defects extraction techniques.

Scripting - Python, Perl, TCL and Shell.

Automation: Tessent and TestMAX tools usage, Linux hands-on experience.

Soft skills, Problem solving, Professional culture, Team work, Communication skills, Leadership, Time management, Networking, Adaptability, 10x thinking.

Details of papers / patents: Not published yet. Will need some more inputs after my joining full time joining before publishing.

Brief description of working environment, expectations from the company: - Very good work culture

- Organized and procedural execution of tasks
- Inclusive and supporting culture
- Great accuracy in work and product quality

- Innovative and challenging projects
- Great learning experience
- Many team events planned throughout
- Everyone is approachable by everyone
- Great team spirit and place for everyone including interns

Academic courses relevant to the project: Digital design, Analog and digital VLSI design, Operating systems, Microelectronics.

Name: SHEWALE TANVI SATISH (2018A3PS0298P)

Student write-up

PS-II project title: Static timing analysis and signal integrity analysis for SoC

Short summary of work done during PS-II: I studied details of STA and SI analysis through various company resources. Building on these, I performed simulations for multiple chip parts and studied the delay representation and violations. Using various noise modelling techniques, experiments were done to find tradeoffs between accuracy, memory usage and run time to optimize the settings used. As a part of the second project, I studied the organization of cell data for a library and the different parameters associated with it. The library was queried to perform sensitivity analysis and rank the cells based on variation.

Tool used (Development tools - H/w, S/w): Synopsys PrimeTime and HSPICE, Ausdia TimeVision, Tcl scripting used in conjunction with the specific methods of these CAD tools, Python scripting.

Objectives of the project: I worked on 2 projects during PS2. First one focused on noise modelling methodologies for chips and simulation of the same. The second was standard library profiling to generate a preference order for cells based on different parameters.

Major learning outcomes: I was a part of the STA team, working in the physical design domain. I was able to build on my fundamentals for STA taught in EEE CDCs and generate models to simulate the setup and hold violations as a part of the first project. The second project helped me understand the variety of cells available and organization of libraries provided by foundries.

Details of papers / patents: No papers / patents.

Brief description of working environment, expectations from the company: Each intern is assigned a mentor and a co-mentor who work closely with them. The manager also has some interaction (might vary for different interns). There are regular sync ups with mentors, often more than once a day. Apart from this, there are 2 internal team presentations and presentations for multiple teams. Intern is expected to maintain a proper documentation of all the work done.

Academic courses relevant to the project: Digital design, MuE, ADVD.

Name: VORA MIHIR KETAN (2018A3PS0755G)

Student write-up

PS-II project title: Functional & performance validation of memory sub-system of SOC

Short summary of work done during PS-II: Expanded coverage for System Level Cache and Memory Controller IPs by adding various tests for different complicated scenarios. Helped in finding bugs and drove debugs for the same by plotting waveforms.

Tool used (Development tools - H/w, S/w): Verdi, Zebu, C programming.

Objectives of the project: To improve the pre-silicon emulation coverage for the IPs, add more tests to the existing codebase, execute and verify the results against the expectations.

Major learning outcomes: Silicon validation process, SOC architecture, Emulation tools, Verdi.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is really good with ample opportunities to learn and grow. The mentor was helpful throughout the project which led to successful completion of project objectives. Got opportunities to interact with senior executives and also with other offshore interns. Overall, it was a fruitful experience.

Academic courses relevant to the project: Computer Architecture, Digital Design.

Name: RITIK GARG (2018A8PS0457P)

Student write-up

PS-II project title: Development of performance analysis tool for design verification

Short summary of work done during PS-II: Developed tool to analyse performance of the given design using SV components and Python scripts.

Tool used (Development tools - H/w, S/w): Verdi/VCS, Python, SystemVerilog.

Objectives of the project: To develop infrastructure to calculate performance metrics of the DUT.

Major learning outcomes: SystemVerilog, UVM, Python scripting, Computer architecture.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: It was a healthy working environment and the mentor was supportive.

Academic courses relevant to the project: Computer Architecture, Object Oriented Programming, Microprocessors and Architecture.

Name: P SMRITI (2018AAPS0415H)

Student write-up

PS-II project title: System on Chip (SoC) prototyping and emulation

Short summary of work done during PS-II: I was involved in prototype bring-up and emulation with the silicon validation team at Google. My project was primarily divided into bringing up two builds (FPGA and hardware emulator ZeBu) and debugging the issues. The FPGA implementation of the SoC architecture involved performing FPGA synthesis, place and route and bitstream generation. Trace32 was used for debugging the system via JTAG. Specific implementation issues like setup and hold timing violations and DRC (design rule check) violations were debugged and resolved for a cleaner build. The next part of the project was bringing up the SoC architecture with the necessary interfaces on hardware emulators like ZeBu. ZeBu's emulation flow is similar to that of design verification. Accordingly, a test bench was created. The interfaces (transactors) are virtualized and instantiated in the test bench. Implementation issues like clock propagation and incorrect memory access were resolved by modelling the memory for the emulation environment and modelling the IO pads for the inout ports of the design. The ZeBu build was released to the software team for their software development and testing and to the silicon validation team for emulation activities. The release was the project's main deliverable which was met.

Tool used (Development tools - H/w, S/w): The FPGA prototype involved EDA tools Synopsys Synplify, Xilinx Vivado and Lauterbach Trace32. Build implementation on Synopsys hardware emulator ZeBu uses Synopsys VCS, Xilinx Vivado and Synopsys Verdi.

Objectives of the project: The project's objectives involved bringing up the SoC prototype on FPGA and hardware emulators like ZeBu. Performing sanity tests on prototypes and debugging the issues. Finally, releasing the prototype to respective teams for software development and other components.

Major learning outcomes: The following are the major learning outcomes are as follows:

- Understanding complex SoC architectures and clocking structures
- Implementing the prototype bring-up methodologies and practices
- Resolving setup and hold timing violations on FPGA
- Learnt about validation and debugging procedures using JTAG

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work culture of the company is excellent. The transparency and resources available aid the project work and overall internship experience. Enough care is taken from the team's side to ensure that you are enabled with the necessary knowledge to carry out the required functionality effectively. A certain amount of cross-functional collaboration is involved, which was seamlessly facilitated by the host team. The expectation from the company involved meeting the deliverable deadlines and project milestones. Enough support was given to meet the same. Other expectations involved documenting the prototype database and being part of the debugging process.

Academic courses relevant to the project: Analog and digital VLSI design, FPGA based system design lab, Computer architecture, Digital design.

PS-II Station: Granules India Ltd., Hyderabad

Faculty

Name: Bharathi R

Student

Name: SANCHITA DEY (2020H1470339P)

Student write-up

PS-II project title: Drug Master File (DMF) and it's requirements

Short summary of work done during PS-II: Drug Master File compilation, learnt the requirements for the DMF filing, different requirements for the DMF filing at different health authority. Handling customer queries, doing timely update of the Regulatory Information management system (database) for the products filed in different countries. Learnt different regulatory guidelines.

Tool used (Development tools - H/w, S/w): MS Excel, MS word.

Objectives of the project: To provide a confidential, detailed documents related to API manufacturers to USFDA & other Health authorities & to protect Intellectual property right of the product from it's partner while complying requirements for process details disclosure.

Major learning outcomes: Drug Master File compilation, learnt the requirements for the DMF filing, different requirements for the DMF filing at different health authority. Handling customer queries, Doing timely update of the Regulatory Information management system (database) for the products filed in different countries. Learnt different Regulatory guidelines.

Details of papers / patents: Review article writing is in progress

Brief description of working environment, expectations from the company: Good and supportive working environment.

Academic courses relevant to the project: Yes (Quality Assurance and Regulatory Affairs)

PS-II Station: GreyOrange Ltd., Gurugram

Faculty

Name: Pawan Sharma

Student

Name: SHUBHAM KUMAR (2017B4A30712G)

Student write-up

PS-II project title: Proof of concept on Mulesoft and APiGEE API Gateway

Short summary of work done during PS-II: Conducted proof of concept (POC) on API Gateways provided by Mulesoft (Salesforce) and APiGEE X (Google) as per the requirements shared by the company that helped them to migrate their API infrastructure to the cloud platform while reducing the cost of operation. Implemented dummy REST and Websocket APIs in Python & Node.Js which were hosted as Google Kubernetes Clusters and were exposed to the external world using Nginx ingress for testing the API proxy layers. Verified different out-of-the-box policies like spike control and JWT authentication/validation as well as implementing different custom policies like circuit-breakers and message/protocol transformations using JAVA and XML in the Anypoint platform provided by Mulesoft. Deployed Mulesoft runtime environment on-premise on the local machine and GCP as a single docker container and Kubernetes clusters for testing all the hybrid models provided by Mulesoft. Modified an existing Springboot API (JAVA) that was used to retrieve SKU/non-SKU items to have an additional retrieval option to retrieve by timestamp (ISO 8601 format) by implementing a new Springboot JPA native PostgreSQL query. Updated Node-Red flows that were used for sending and retrieving messages from the Apache-Kafka broker to support synchronous inflow while maintaining an asynchronous outflow. Also analyzes different sub-flows and suggested ways for improvement.

Tool used (Development tools - H/w, S/w): Java, XML, Erlang, Javascript, Python, Springboot, PostgreSQL, Docker, GKE, APiGEE, Dataweave language, Anypoint studio, Anypoint runtime environment, Google Cloud Platform, Jumpbox(VPN), Apache Kafka, Node-Red.

Objectives of the project: To conduct POC on API Gateways provided by Mulesoft and Google APiGEE to help in migrating the API infrastructure of the company to cloud platform.

Major learning outcomes: Got an insight into the working of APIs and their interaction with various layers such as nginx ingress and API proxies. Learned to implement various policies that includes rate limiting, JWT authentication / validation, circuit breakers, canary releases, protocol transformation, payload transformation and also learned to create custom policies using Mulesoft Anypoint Platform and Java Callouts for APiGEE. Learned to implement containerized apps of APIs (REST and Websocket) in Docker and hosting them on Google Kubernetes Engine. Got an opportunity to learn a new language, Erlang. Worked with Devops team to gain an insight on the configuration of Ingress. Interacted directly with the Mulesoft support team to understand the platform and deployed it on their cloud (cloudhub), locally and on GKE to test the on-premise deployment. Learned to write Spring Boot native JPA queries for interacting with PostgreSQL. And during the final phases of the program got an insight about no-code environment using Node-Red and data streaming using Kafka.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: For me, the whole duration of 6 months was WFH so I didn't have the opportunity to visit the site. We used to have a daily sync at 11 AM every day (Mon-Fri) where my team and our mentor used to discuss any obstacles. GreyOrange is one of those companies that treat their interns with the same respect as an employee. My team was consisting of just 2 people, I and my friend and I can recall my mentor introducing us as Software Engineers during a meeting with the Mulesoft team (External). I also got an opportunity to interact with various other teams inside the organization like the DevOps team and Payroll team. I found everyone to be extremely supportive and encouraging. And as the company is constantly growing and receiving huge funds the expectation for PPO is high. My friend and I both were awarded PPO even before the completion of the term. I strongly believe that with such a growth rate, the company will soon surpass the unicorn race.

Academic courses relevant to the project: DSA, OOP, DBMS.

PS-II Station: Harness, Bengaluru

Faculty

Name: Vimal S P

Student

Name: GOEL PRATYUSH RAM SHARAN (2017B5A70899P)

Student write-up

PS-II project title: Harness NG platform

Short summary of work done during PS-II: I mainly worked on Kubernetes and Native Helm swimlanes. I developed stores that would enable the user to create an inline or custom remote manifest and override their config files. Apart from this I also got to work on some small features, tech debts, CFDs (Customer Found Defects), Automations and UT.

Tool used (Development tools - H/w, S/w): Kubernetes, Helm, Openshift, Kustomize, CI/CD, Java, SpringBoot, MongoDB, Harness.

Objectives of the project: Add support of different store types to provide flexibility while creating a manifest.

Major learning outcomes: Learnt a lot about DevOps, Continuous Integration and Continuous Delivery.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The company has very good working culture. People here are very helpful. There can be a lot of things because it is a growing startup, but at the same time you will get to learn a lot.

Academic courses relevant to the project: Knowledge of OOP and DAA was extensively used.

Name: ARPIT JAIN (2018A7PS0267P)

Student write-up

PS-II project title: Harness SRM

Short summary of work done during PS-II: I work like any other full time SDE in harness SRM team. Worked on many features and bugs. In the begin I also worked on code refactoring.

Tool used (Development tools - H/w, S/w): Java, IntelliJ, Git, Postman.

Objectives of the project: Build and enhance features for Harness SRM.

Major learning outcomes: Writing readable code, using proper Java language constructs, understanding AGILE methodology.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Smooth onboarding process, I had multiple mentors, MD of company also helped us at regular intervals, my projects were customer facing and made enhancements to the Harness SRM product.

Academic courses relevant to the project: OOP, C programming.

PS-II Station: Hindustan Unilever Research Centre, Bengaluru

Faculty

Name: Santosh Sopanrao Khandgave

Student

Name: KAVIYA S (2020H1010023H)

Student write-up

PS-II project title: Modelling of the transport of light and sensitivity analysis

Short summary of work done during PS-II: There are many colorful formulations in the real world. If one has to formulate and fine tune color of various formulations, it can involve many trials. This report deals with explaining the development of the model to predict the appearance of the final product color. Further, it covers methodologies followed to develop physics-based model and incorporating the results from the model into the color prediction model. Moreover, after developing the model, good amount of data was generated from the simulation work. This data helps in understanding the sensitivity of color to various parameters such as pigment composition, refractive index, size and concentration of various scatterers present in the products.

Tool used (Development tools - H/w, S/w): Python, Mie python module, Numpy, Scipy.

Objectives of the project: Develop a model to predict the final appearance of the colour.

Major learning outcomes: Learnt about scattering and absorption of light and how we can relate radiative transfer coefficient with Kubelka munk coefficients. Kubelka munk equation for finding reflectance and transmittance. Also learnt about Mie Theory.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working Environment: Very positive environment, Supportive and motivating people all around. The company expects sincere involvement and dedication in the work allotted. They expect positive attitude. More than results they see the process and amount of hard work you put in to fetch the results. It's all about learning new things.

Academic courses relevant to the project: Numerical methods in chemical engineering, Optimization.

PS-II Station: HSBC, Bengaluru

Faculty

Name: Sidharth Mishra

Student

Name: SATYA JEET (2020H1490803P)

Student write-up

PS-II project title: Segment Insight MI

Short summary of work done during PS-II: The management Information has to be updated at regular intervals. The queries from stakeholders regarding MI has to be resolved.

Tool used (Development tools - H/w, S/w): Excel, SAS, Python, Qlik, SQL.

Objectives of the project: To help the team take decisions based on analytics.

Major learning outcomes: Excel, SAS, Python, Qlik, SQL.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is great and colleagues are cooperative. We are expected to complete the work in stipulated time and without any error.

Academic courses relevant to the project: Business Statistics.

Name: VAIBHAV JOSHI (2020H1490805P)

Student write-up

PS-II project title: Impact of ESG (Environment, social, governance) on valuation

Short summary of work done during PS-II: Analysing companies ESG performance through its disclosures and policies on ESG and its rating scores. Peer benchmarking and providing recommendations to clients based on that. Preparing pitch books for different clients.

Tool used (Development tools - H/w, S/w): NA

Objectives of the project: To find the impact of ESG on valuation of companies.

Major learning outcomes: How ESG impacts the business, how to minimize ESG risks. Also major learning is working with senior people and reaching the deadlines on time.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is good. Senior leadership is very good. They provide flexibility to their employees.

Academic courses relevant to the project: Yes

Name: RAVI SHANKAR (2020H1490806P)

Student write-up

PS-II project title: People analytics digital insights

Short summary of work done during PS-II: The work was a day to day like regular employee of the organization. I was handed over the list of the tasks to be performed on daily, weekly and monthly basis. The tasks involved collaborating with different team members working alongside them and getting the work done. Apart from that there were quality parameters which were used to evaluate the tasks performed like user feedback, timeline, internal feedback, etc. Overall, it was a very exposure like on the job training.

Tool used (Development tools - H/w, S/w): Excel, Power BI, R, Python, Oracle.

Objectives of the project: Overall functioning of the People Insights Team.

Major learning outcomes: The major learning outcome of the PS was getting more insights about HR Analytics. How the analytics is helping the HR in taking informed and data backed decisions. It also helped to get to know how the team works within an organization, how to co-ordinate within and cross functional team to work on different projects for the wider organizational impact.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was very productive. All the team members were helpful. One could reach out to anyone for help. The manager was very supportive. It was a very dynamic and friendly environment for working.

Academic courses relevant to the project: Business Analytics, Operations and Supply chain, Marketing, Human Resource Management, Strategic Management.

Name: IVIN C GEORGE (2020H1490809P)

Student write-up

PS-II project title: RAF HC - Performance Dashboard (RAF - Real Assets Finance, HC - Head Count)

Short summary of work done during PS-II: I was able to Support day to day activities of Real Assets and Structured finance team. I was able to contribute further by creating RAF HC - Performance dashboard and League table dashboards.

Tool used (Development tools - H/w, S/w): Excel, PowerPoint.

Objectives of the project: 1.To provide insights on the resource allocation of RAF team with respect to the deals they have done in different regions. 2. To provide updated overview of team structure to the leadership team.

Major Learning Outcomes: 1. Got good understanding about the Real Assets and Structured Finance (RASf) and was able to relate it to the learnings from classroom.

2. Was able to improve my excel and powerpoint skills.
3. Got exposure in stakeholder management.
4. Improved my communication skills and soft skills.

Details of Papers/patents: NA

Brief description of working environment, expectations from the company: I was able to work with the BD/CCO team which had a great work culture and the team was very inclusive.

Academic courses relevant to the project: SAPM, BAV.

Name: DEEPAK MISHRA (2020H1490814P)

Student write-up

PS-II project title: Green Investor Research Profile

Short summary of work done during PS-II: The project specific work was mostly related to researching in the public domain, annual reports, exclusion policies, responsible investment strategies and Sustainable investing. Apart from this I also worked in the bonds pricing sheet and models that were linked to Bloomberg terminal outputs and updating in the company specific grid

Tool used (Development tools - H/w, S/w): Mostly Excel, pivot tables, short projects included Bloomberg.

Objectives of the project: Segregation of the institutional Investors based on their sustainable financing.

Major learning outcomes: ESG is the buzz word going across domains that is needed to be installed and regulated throughout the work mandates.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is very good, mostly team specific work load and required deliverables. The senior leaders pays regular attention towards your working, the mentors assigned are very helpful and can be reached easily. Overall, the experience for me is satisfactory.

Academic courses relevant to the project: SAPM, BAV.

Name: PARIDHI GARG (2020H1490820P)

Student write-up

PS-II project title: Corporate Finance and Investment Banking Coverage

Short summary of work done during PS-II: BAU tasks involved working with strategy and analytics team and assisting them to optimize the deal revenues. Another task involved working with central CFIBC team to analyze the share of wallet.

Tool used (Development tools - H/w, S/w): Excel, powerpoint, Altryx.

Objectives of the project: Providing consulting to corporate finance and investment banking teams.

Major learning outcomes: Got understanding of business and capital finance team along with entire investment banking coverage.

Learnt the application of correct strategy and analysis on case by case basis.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is extremely healthy. Realistic expectations are set for each individual which ensures regular learning and appropriate work life balance. Team is highly supportive and can be reached any time for any doubts.

Academic courses relevant to the project: BAV, SAPM, accounting for managers, IBFS, Corporate Finance, CDT.

Name: UTKARSH FADIA (2020H1490821P)

Student write-up

PS-II project title: Sub-sector study of heat pumps

Short summary of work done during PS-II: I completed my PS 2 in HSBC, Bangalore under the Strategic Transactions Group. During my internship, I worked with the Business Development and Investment Banking teams for a period of three months each. During the phase of the six months with HSBC, I worked in diverse range of projects where I also got the opportunity to implement my knowledge and learn new skills which were required. I learnt about carrying analysis with software like MS Excel that were relevant from the company's point of view. With the Business Development team, I worked on key projects like Share of Wallet Analysis, Sector Review and Client Segmentation for the first three months. During the next three months, I worked with the Investment Banking team on key projects like the Finding Investment Themes, Company screening for subsector like Fuel Cells and Automation, Profile Creation for Clients. I also worked on selecting public companies and updating the industry database. I also got an opportunity to perform a subsector analysis of Heat Pumps. During the phase of the Practice School, I worked with many people at the Analyst, Senior Analyst, Associate and Senior Associate positions and this has helped me a lot in gaining sufficient knowledge and skills to perform tasks successfully. The overall experience in the Practice Schools phase has been satisfying and this has surely prepared me for my professional career ahead. These six months has given me a valuable experience of working with both Business Development and Investment Banking team.

Tool used (Development tools - H/w, S/w): Microsoft Excel, Microsoft Power Point, Microsoft Word, FactSet.

Objectives of the project: The objectives of the projects were to study the Heat Pumps sector and to find the major M&A opportunities with the sector.

Major learning outcomes: Major learning outcomes were:

1. I got an idea of carrying out a industry research of a niche product.
2. I learnt about the sources to refer to for carrying out the research. These include major players company annual reports, investor presentations, broker reports, industry primers, Heat Pumps reports.
3. Learnt about the major categories to include in the industry research presentation. This included Key technology, market data, revenue split data of major players, Geographic revenue split, Key regulations, advantage of using Heat Pumps, M&A opportunity analysis.

4. I learnt about the work of Business Development and Investment Banking within the bank and the major difference between the two.

5. I worked on key projects like Share of Wallet Analysis, Client Segmentation, Sector Review, Key Opportunity Analysis, Company Screening, Profile Creation and selecting companies for updating in the database.

Details of papers / patents: No papers were referred to in the phase on the internship.

Brief description of working environment, expectations from the company: The working environment of the company was very professional and supportive for the interns. During the phase of the internship, I got the opportunity to interact with a lot of people and all of them helped me a lot. The company also provided us with their laptop and when the internship was offline, the company arranged for our transportation and provided accommodation in hotel for the first two weeks of arrival in Bangalore. The company also provided us with all the resources that were needed during the internship and this has helped us in performing us to our full potential. Based on the current situation, I am expecting many more projects to be assigned to me where I can contribute. I am expecting a PPO from the company based on my performance so far in the company.

Academic courses relevant to the project: SAPM, BAV, IBFS, Corporate Finance, Strategic Management.

PS-II Station: IBM India Software Group, Bengaluru

Faculty

Name: Nishit Narang

Student

Name: ADITYA VIDYADHAR KAMATH (2020H1030073G)

Student write-up

PS-II project title: GNU GDB debugger

Short summary of work done during PS-II: Currently in IBM AIX there exists certain issues which are not seen in Linux. For example if any unused variables exist in the program they cannot be printed or debugged in AIX. They may be due to environmental problems or due to the architecture of IBM AIX. To find a fix for them and to add new features to the existing debugger for AIX was the problem statement for this internship project.

Tool used (Development tools - H/w, S/w): GNU debugger, GIT, Linux, AIX, Cscope.

Objectives of the project: 1: To submit patches by resolving bugs that exist in the current version of the debugger. 2: To add new features in the debugger.

Major learning outcomes: 1: How a debugger works 2: Importance of system calls 3: How to operate in an open source project.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good working environment and encouraging colloques. Expectation was a feature addition and a couple of patch contributions to the open source community.

Academic courses relevant to the project: OS, Compiler, C, C++.

Name: AMAN SRIVASTAV (2020H1030137H)

Student write-up

PS-II project title: Cloud data access

Short summary of work done during PS-II: Along with the introductory educations the main focus was on building the regression buckets for the functional testing of the APIs and assisting the team to build a pipeline for end to end automation.

Tool used (Development tools - H/w, S/w): z/OS, ISPF panel, Jenkins, ATOCS and Punchpy.

Objectives of the project: CDA Services facilitates access to Cloud Object Storage objects through APIs.

Major learning outcomes: Learnt the working of z/OS, Application Programming Interface, Jenkins and Groovy.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working Environment is very comfortable. All seniors along with the manager were extremely helpful and understanding, they helped me in learning new technologies with ease and cleared every small doubt.

Academic courses relevant to the project: Cloud Technology and Advanced Operating Systems.

Name: DIKSHITA KRISHNAN IYER (2020H1030139H)

Student write-up

PS-II project title: POC to enhance power hardware management console (HMC) for openstack architecture

Short summary of work done during PS-II: To summarize the problem statement, the first part of the problem to be solved is to make a lpar on any system which can be managed by any system as well as the system it is installed on. HMC can manage other systems and Novalink can manage the host / parent system i.e. the system it is installed on. The idea here is to make novalink and HMc work together so that they can work together and scale out and scale up the model of management.

Tool used (Development tools - H/w, S/w): Code base written in python, REST API, Putty used to connect to novalink and HMC, Command line arguments (RPM commands) used to install pypowervm on HMC, HMC GUI, HMC commands to try creating, updating commands, Docker, Podman.

Objectives of the project: The project aims to scale out and scale up the model of management and reduce the dual dev/test effort management and simplify the development and deployment model. The scope of the project includes : Openstack services package and deployed on HMC.

Major learning outcomes: Learnt to use containers like podman, docker, worked iwth python for managing systems, used rest API.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment was very friendly, my mentors were really helpful, they helped me solve any problems, manager was always helping, other colleagues were also were helpful.

Academic courses relevant to the project: Cloud Computing, ADvanced Computer Architecture, Advanced Operating System.

Name: MANAN CHAWLA (2020H1030153H)

Student write-up

PS-II project title: Supply Chain Intelligent Suite and Serverless Computing

Short summary of work done during PS-II: In SCIS domain, worked with the front-end team and learned how to maintain the existing code while maintaining the standardization across the work. Also did unit and E2E testing for my work. Regrading serverless team, learned how to shape a pseudo code into reality and create an algorithm which can save a company's time and space complexity.

Tool used (Development tools - H/w, S/w): HTML, CSS, Angular, Carbon, Jasmine, IBM Cloud, Python.

Objectives of the project: Work on the front end part of the SCIS product. Developed and tested an algorithm for serverless computing.

Major learning outcomes: Learnt the fundamentals of working in a live project.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Had a great learning experience in a professional environment. Where one has to work on their technical and social skills rigorously. Learned that every this is possible with team work and dedication. Continuously forcing our limits and learning a new thing every day.

Academic courses relevant to the project: Yes, by working on the college projects with deadlines, made me quite comfortable in delivering the work on time.

Name: NAVANDAR MADHUR RAJESH (2020H1030163H)

Student write-up

PS-II project title: Supply Chain Intelligence Suite

Short summary of work done during PS-II: As our project was mainly related to supply chain management, it help me know what the domain's knowledge of the supply chain intelligence suites like what all factors are important for the vendors to take care of whose warehouses are in multiple cities, analysis of overall performance of it's business like how many products are deliver to customer on time. How many products each warehouse has, geographical location and its weather condition are also reported so the vendor can make strategic decisions of the business and can take quick actions to improve overall profit from the business. As tasks were mainly based on the frontend and backend development, I became somewhat familiar with concepts of Angular framework, and how to write tests in Jasmine. Apart from that I also become familiar with concepts of Spring framework and how the overall application works together as a whole.

Tool used (Development tools - H/w, S/w): Angular js, Jasmine, postman api, springboot, Java.

Objectives of the project: ApplySpeed of automation to improve supply chain resiliency.

Major learning outcomes: Learnt about front-end technologies and some backend work in java spring boot.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: During this period of 6 Full Months, I came across various technologies that are being used in the industry and especially in IBM Supply Chain Intelligence Suite department. I got to learn and work on a lot of new things which will be very helpful for me to grow as a software developer. I came to know about the work culture of a company and how things go around in the professional business and technical world. I laid my hands on a lot of new technologies and learnt and implemented them successfully. During this period, I also learnt to work independently and as a team. I got to know the importance of collaboration and teamwork. I would like to thank my station mentor Rachna Issar maam for giving me the opportunity to work in IBM Labs and my PS mentor Nishit sir for taking care of all the academic activities properly and on time.

Academic courses relevant to the project: yes

Name: ISHA UPADHYAY (2020H1120283P)

Student write-up

PS-II project title: UI tools exploration and integration

Short summary of work done during PS-II: Explored various tools for Observability Integration in MaaS360 like New Relic, Sentry and Instana for improving the Customer experience. Worked on application based on React.js library and captured UI errors. Integrated Google Lighthouse Tool to CI/CD Pipeline for MaaS360 Application. Used Jenkins and Docker for CI/CD Workflow. Both of these tasks come under Production Domain.

Tool used (Development tools - H/w, S/w): Javascript, Jenkins, Docker.

Objectives of the project: Exploration of Observability Tools and Automated UI Performance Evaluation Tools; and Integrating with IBM MaaS 360 application.

Major learning outcomes: Web development (Front-End)- React.js, Usage of Jenkins, Docker, Collaborative working.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Flexible working hours. Supportive mentors and manager.

Academic courses relevant to the project: OOAD, DSA.

PS-II Station: iDrive Capital, Bengaluru

Faculty

Name: Gaurav Nagpal

Student

Name: ARRABELLY SAI ANURAG REDDY (2018A4PS0059H)

Student write-up

PS-II project title: Investment Banking for Startup Fundraise from VCs

Short summary of work done during PS-II: Attended more than 50 startup and VC calls, scouted about 200 startups by sector wise analysis. >Reached out to about 40 startup founders on my own >Researched and shortlisted Singapore Based VC and private equity funds which are focused on Fintech and Health tech space >Posted the jobs from LinkedIn profiles for various startups from the startupjobs portal >Helped in shortlisting the resumes as part of startupjobs initiative. >Following up with the VCs post the calls >Scheduling new calls based on the availability of free time slots in the calendars of both the VC and iDrive capital >Read finance newsletter everyday to know which sectors are currently hot in the startup - VC ecosystem >Pick up my favorite companies and study their business models. For example: BookMyShow Assisted a climate tech startup receive Term sheets of worth \$3 Million from investors. We have come up with new initiative called "iDrive Finance" where we offer CFO services to the growth stage startups. M&A is also the current focus of iDrive since there are lot of opportunities in the ecosystem at the moment .Funding winter in the market due to reduced liquidity and high inflation has led to delay in late stage funding. The next 8-10 months period is a good opportunity for small startups to be acquired by big players.

Tool used (Development tools - H/w, S/w): Microsoft Excel, MS PowerPoint.

Objectives of the project: The objective of investment banking at iDrive Capital is to assist startup founders in their fundraise journey by making them connected with suitable investors who do ticket sizes which best suit for that particular fundraise round like seed, series A etc.

Major learning outcomes: - Upon continuous evaluation of startups, I have understood what type of Business models can survive in the market and what can potentially fail.

- After attending many pitch calls, I have observed that not only the startup performance but also the founder background and interpersonal skills matter a lot for follow on conversations.

- After reviewing several startup pitch decks, I have understood that presenting your startup in an efficient way for a pitch is very important.

- Most important of all, I have learnt how to professionally interact with founders, investors, my colleagues and anyone in this startup ecosystem.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: A very healthy work environment where there is high scope of learning. Friendly behavior from seniors at work can be expected. Investment Banking experience at iDrive Capital is perfect platform especially for those who wish to enter and pursue investment banking career or venture capital.

Academic courses relevant to the project: 1) FIN F313 - Security Analysis and Portfolio Management 2) ECON F211 - Principles of Economics.

PS-II Station: Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam

Faculty

Name: Sindhu S

Student

Name: PATIL CHAITANYA (2016B5A80418G)

Student write-up

PS-II project title: Development of Algorithms for Waste Assay Computed Tomography System to Estimate Special Nuclear Materials in Waste Drum

Short summary of work done during PS-II: Algorithms for analysis of nuclear waste using computed tomography were developed

Tool used (Development tools - H/w, S/w): MATLAB

Objectives of the project: Waste assay Computed Tomography system has been indigenously developed at SQRMG, IGCAR for identification of (a) special nuclear materials (SNM) in waste drum and (b) internal defects in engineering objects. To locate and estimate SNM in a waste drum.

Major learning outcomes: Computed Tomography, MATLAB.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Work from home, extremely helpful mentor.

Academic courses relevant to the project: Computational Physics

Name: MADHAV RANGAN B V (2017B5A31103H)

Student write-up

PS-II project title: Study and application of AI to predict abnormalities in a reprocessing plant

Short summary of work done during PS-II: The subdivision I was assigned to was the reprocessing group, within that the demonstration Fast Reactor Fuel reprocessing plant or DFRP's electrical division. The Plant has equipment seen in typical Chemical processing plants like boilers and evaporators and everything was governed by a SCADA system, my project revolved around evaluating if the data we received from the SCADA server may be used to perform predictions which may help the operators make decisions. One of the possible ways in which principles of AI might be used in the plant was to predict the density of a mixture in an evaporator using its current temperature and density after the evaporator has ceased to operate, for example.

Tool used (Development tools - H/w, S/w): Microsoft SQL, Fedora Linux, Python (Anaconda Distribution).

Objectives of the project: To study the concepts of AI can be used with conjunction to existing equipment in a Reprocessing plant to predict process abnormalities or other variables.

Major learning outcomes: Application of AI/ML concepts in Python, SQL in a real life scenario.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Being a secure government institution important to nation's interests, the entry and operation will be quite tedious but the mentors and other employees are very patient, friendly and accommodating. Overall it will be quite a challenging environment to work in and will give a glimpse of how research institutions function and will thus give valuable experience.

Academic courses relevant to the project: MATH F112 Mathematics II, MATH F113 Probability and Statistics, CS F111 Computer Programming.

Name: AMOL BAKSHI (2020H1060269H)

Student write-up

PS-II project title: Study on additive manufacturing of stainless steel components using L-PBF

Short summary of work done during PS-II: 1. A new experience of learning about the L-PBF method helped me to conduct the studies further in the project. The research paper survey consisted of the drawbacks and the errors that had been detected in the different existing studies. 2. Moving on, keeping the errors in mind, the tests for the materials were run before the manufacturing of the product. 3. This helped in eliminating the possible areas of defects and thus success of the product. The products were manufactured and further analysed for the strength, compression and the tensile stresses within the component. 4. Though I was familiar with the solid-works software, I had a new experience while designing the manufactured component. The created model had the tolerances and the dimensions in it. There were two components that were manufactured with the L-PBF process- A. YOKE- the material used for the manufacturing is 17-4 PH SS. B. IMPELLER- the material used for the manufacturing is AISI SS304. C. These manufactured component can be used in different industries.

Tool used (Development tools - H/w, S/w): Solid-works software, Creo parametric.

Objectives of the project: 1.To learn the laser bed powder fusion technique. 2. To apply the learning from the L-PBF process for the manufacturing of the stainless steel components. 3.To test the different parameters of the steel components. 4. To analyse any defects that may take place.

Major learning outcomes: 1. A new experience of learning about the L-PBF method helped me to conduct the studies further in the project. The research paper survey consisted of the drawbacks and the errors that had been detected in the different existing studies. 2. Moving on, keeping the errors in mind, the tests for the materials were run before the manufacturing of the product. 3. This helped in eliminating the possible areas of defects and thus success of the product. The products were manufactured and further analysed for the strength, compression and the tensile stresses within the component.

4. Though I was familiar with the solid-works software, I had a new experience while designing the manufactured component. The created model had the tolerances and the dimensions in it. There were two components that were manufactured with the L-PBF process-

A. YOKE- the material used for the manufacturing is 17-4 PH SS.

B. IMPELLER- the material used for the manufacturing is AISI SS304.

C. These manufactured component can be used in different industries.

Details of papers / patents: No patent as of now.

Brief description of working environment, expectations from the company: IGCAR being a govt organization has an exceptional working environment. the supervisors were very helpful and supportive throughout the project development. It has the typical environment where ideas from different background find a common platform for the greater good. the mentors specifically made every effort to push the new ideas even if they were in the wrong direction. the overall working experience in the organization was very good.

Academic courses relevant to the project: Tribology, Manufacturing Engineering, Product Design and Development, FEM, Strength of Materials, Turbomachinery.

Name: SIDDHANT AJAY ARVIKAR (2020H1410192H)

Student write-up

PS-II project title: Conceptual design, development and analysis of PFBR sub-assembly transfer mechanism from single sub-assembly Transfer Cask (SSTC) to Dismantling cell of Head End Facility (HEF)

Short summary of work done during PS-II: At first the 3D models were made from the given engineering drawings and they were assembled. The Single Sub-assembly Transfer Cask (SSTC), Basket assembly, hot cell layout, Cask lifting Yoke mechanism, Dolly, Door mechanism, Push-pipe mechanism and the guide-track system were made by assembling the parts. In all the mentioned assemblies, the guide-track system was only analysed for the Hot cell 1 layout. In the

analysis, the geometry was made in such a way that it resembles the actual one with all the constraints. For that the C-section beam, rectangular hollow section beam and the base plate is divided throughout its length in portions for which the length is kept equal to the distance between the holes provided for the attachments in the actual model. The meshing is done with the hex/brick elements for appropriate results. After this the assemblies which were made earlier, are placed in a common layout and the animation video of the whole process i.e. receiving the SSTC and pushing the basket assembly inside the Hot cell 1 & 2 is done.

Tool used (Development tools - H/w, S/w): ANSYS, CREO, SOLIDWORKS.

Objectives of the project: The objective of the project is as follows:- 1) Construction of CAD model of SSTC and Basket assembly. 2) Designing the guide track system for the Basket assembly. 3) Performing structural analysis in ANSYS to know the sustainability of the new guide tracks.

Major learning outcomes: The most important thing which I learnt from this project is the approach towards a designing a new model based on the requirements of the organisation and the implementation of several technical parameters for the required model.

Details of papers / patents: NIL

Brief description of working environment, expectations from the company: It was working from home in this organization. The tasks given by the company were in accordance with the scope of my branch as well as the project was challenging which helped me to improve my skill-sets.

Academic courses relevant to the project: CAD, Finite Element Analysis, Strength of Materials.

Name: MAHENDRA SAI M (2020H1410197H)

Student write-up

PS-II project title: Mechanical behavior of load characteristics on extended reach master slave manipulator

Short summary of work done during PS-II: In this project, I have performed modal and static structural analysis on an extended reach master-slave manipulator, which has been designed in Autodesk Fusion 360 and assembly file is uploaded in ANSYS Workbench, and the necessary connection of joints has been defined, and simulation was performed to obtain the natural frequency, stress, and strain for different cases.

Tool used (Development tools - H/w, S/w): Autodesk Fusion 360, ANSYS Workbench, ANSYS Mechanical APDL, MATLAB.

Objectives of the project: This project involves the modeling of slave arm major links with their revolute and prismatic joints using corresponding joint stiffness and FEM analysis to evaluate the effect of basic mechanical characteristics such as static stress and deformations.

Major learning outcomes: Exploring New Solution Type in Simulation Module and study the effect of natural frequency in Extended Reach Master Slave Manipulator.

Details of papers / patents: Publishing of the results in future.

Brief description of working environment, expectations from the company: Since the PS station was a combination of work from home and on site I had been doing my work in my personal laptop and would have detailed discussion on my results also get my queries clarified in the session and new work was assigned to me regular on my completion of previous task. I also had a visit to different sub system area which are related to my project. The major expectation from the org. is that task need to be completed and have a standard communication in general and the org. is really friendly asking doubts are appreciated more than exact results because the coordinator will have opportunity to teach you why the mistake occurred and how to rectify. So far the project work has been smooth will be publishing my work in future.

Academic courses relevant to the project: Dynamics and Vibration, Finite Element Method, Robotics and Strength of Material.

Name: BABAIAHPALLI NAGAPPA GARI NAVYA SREE (2020H1480289H)

Student write-up

PS-II project title: Numerical analysis of flow assisted corrosion via mass transfer coefficient in pipe bends of nuclear power plant

Short summary of work done during PS-II: Carbon steel feeder pipe in primary and secondary coolant systems of pressurized heavy water reactors are prone to a type of corrosion attack called Flow Accelerated Corrosion (FAC). FAC is a degradation mechanism which encounters with piping system on carbon steel or alloy steel in Indian Nuclear Power Plants (NPP). This phenomenon is possible in primary and secondary circuit systems of NPP. Even though piping in secondary side is especially susceptible, the carbon steel piping in primary side of Pressurized Heavy Water reactor also gets affected. Hence, an attempt is made to consider one such critical geometry, namely double elbow and the nature of flow under FAC conditions is analyzed in it. Three parametric case studies are analyzed i.e., Reynolds number variation, Bend radius variation and bend angle variation. It is concluded from the study that component geometry affects the corrosion rate. The pipe geometry is suggested to consider high bend radius, low Reynolds number and low bend angle.

Tool used (Development tools - H/w, S/w): ANSYS Fluent software.

Objectives of the project: The main objective of the project is to reduce the corrosion rate near the pipe bends.

Major learning outcomes: Working on ANSYS Fluent software.

Details of papers / patents: No

Brief description of working environment, expectations from the company: The work environment is good. Working with scientists gave good exposure to learn work.

Academic courses relevant to the project: Computational Fluid Dynamics.

PS-II Station: Indus Insights and Analytical Services Pvt. Ltd., Gurugram

Faculty

Name: Anindya Neogi

Student

Name: DEVANG DHALL (2018A4PS0849G)

Student write-up

PS-II project title: Product, Sales and Lender Integration

Short summary of work done during PS-II: Worked on a retainer engagement with one of the clients of Indus Insights assisting in their ongoing assignments.

Tool used (Development tools - H/w, S/w): SQL, Excel and partly Python.

Objectives of the project: Optimise user journey, analyse different user segments, and increase revenue.

Major learning outcomes: Understanding of lending business in India.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Typically 8-10 hours of dedicated work is expected per day. 5 day week. Working in hybrid model (3 days from office, 2 days optional WFH).

Academic courses relevant to the project: None

Name: GUPTA SRIJEN JAGDISH (2018ABPS0755P)

Student write-up

PS-II project title: Enhance targeted marketing of a credit card issuer based out of India and offer creation for largest Airline company based out of US

Short summary of work done during PS-II: Usually work involved regular interaction with client business stakeholders and reporting them with the required deliverables. At first, business problem discussion takes place and then project pipeline is created. Problem is broken down into small segments which involved data processing, data understanding and insights generation. Tools like python, sql, excel and tableau were extensively used to understand data and create it in a format which is presentable to client. Once deliverables are ready then insights are noted down and business stake holders are communicated with the recommendations that would help them improve their business strategy.

Tool used (Development tools - H/w, S/w): Python, SQL, R, Tableau, MS Excel, MS Powerpoint

Objectives of the project: To solve client problems through an analytical approach and generate insights using data.

Major learning outcomes: 1. Understanding applications of different mathematical models in practical scenario

2. Data pre-processing and cleaning
3. Developing hard skills on technologies like Python, R, SQL MS Excel etc.
4. Different marketing decisions that are made in credit card industry
5. Airline business and loyalty program offer's scheme
6. Logics and strategy behind personalised offer creation and targeting customers

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work Environment- Semi-Formal type setup which allows flexibility to do WFH as well as WFO. Client interaction is provided and ownership of project is provided to some extent which doesn't make one feel alienated from objective of the work.

Training Sessions- Training sessions for R, Python, SQL and MS Excel are scheduled and are quite extensive. Tools are extensively used in projects and hence one can develop these skills to a great level.

People- Good friendly peer group with age group <25 so much more like college seniors. Quite supportive with tools and approach to tackle the problem.

Academic courses relevant to the project: Courses that are relevant are, Foundation of Data Science, Applied Statistical Methods, Probability and Statistics.

PS-II Station: Infineon, Bengaluru

Faculty

Name: Sanjay Vidhyadharan

Student

Name: MEERA RAMPRASAD (2017B4AA1021G)

Student write-up

PS-II project title: IO Design, development and validation

Short summary of work done during PS-II: End to End IO design and development, including design, verification, layout and yield analysis.

Tool used (Development tools - H/w, S/w): Cadence Virtuoso, Mentor Calibre.

Objectives of the project: IO Design and Development.

Major learning outcomes: VLSI Design, Analog Design.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Very friendly team members and co-workers. Great learning curve and drive for innovation.

Academic courses relevant to the project: Analog & Digital VLSI Design, Microelectronic Circuits, Digital Design, Electrical Sciences.

Name: KULKARNI ADVAIT HARSHAD (2018A3PS0260G)

Student write-up

PS-II project title: Internship and training at Infineon

Short summary of work done during PS-II: The main aim of the internship at Infineon technologies is training me in its bluetooth / BLE portfolio and then moving on to solve threads and cases, thereby integrating into the work by the time the internship ends. The training has gone through a diverse range of phases like training on various software, sessions by the company, video lectures on various topics, and exercises to be implemented on the hardware kits.

Tool used (Development tools - H/w, S/w): Modustool box, Eclipse IDE, PSoC 6 Wi-Fi + BT combo device.

Objectives of the project: Getting trained in the portfolio of chips supporting bluetooth I will be working on.

Major learning outcomes: Solving customer issues, designing and demonstrating a project at a company conference.

Details of papers / patents: Proof of concept was developed for a project idea and presented at a conference.

Brief description of working environment, expectations from the company: The working environment is very good. The work life balance is great and seniors and managers are very helpful and approachable.

Academic courses relevant to the project: Embedded system design, C programming.

Name: ALARK FAJALIA (2018A3PS0296P)

Student write-up

PS-II project title: Current sensing amplifier based fault detection circuit

Short summary of work done during PS-II: A project statement was given and DC, AC specifications were provided. based on that a current sensing amplifier was designed meeting specifications. based on current values sensed, fault cases were detected.

Tool used (Development tools - H/w, S/w): Cadence, UNIX system.

Objectives of the project: Current Sensing Amplifier design understanding.

Major learning outcomes: Learned how robust circuits are designed in industry, layout and other fixes and techniques required to improve performance.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The environment is friendly, mentor and manager communicates effectively and regularly. the teams are welcoming.

Academic courses relevant to the project: Analog Electronics, ADVD, Microelectronic circuits.

Name: SHELENDRA KUMAR (2020H1230245P)

Student write-up

PS-II project title: Physical integration of usb products (RTL TO GDSII)

Short summary of work done during PS-II: This project proposes the complete flow RTL to GDSII of fx3g2 and s22smifphy projects and learning of Logical Equivalence Checking – Flow, challenges, benefits, understand low power design and the low power checks associated in the Design flow, to perform the low power checks using cadence conformal tool. This flow consists different steps such as RTL coding, synthesis, DFT, timing analysis, placement, routing and some verifications at required stages. Verilog is used as hardware description language in the RTL coding. Synthesis generates gate level netlist from RTL code, it requires mapping and some optimization. DFT is used to make testing easy and cost efficient, for this we add some extra logic in this. PNR is the backbone of this physical integration, in this placement, power planning and routing should be done. At each stage formal verification and multi voltage rule check is required for low power design. Physical verification and power calculation also done at the last of this flow. During PS-II, my major focus on Understand low power methodologies and perform CLP check on fx3g2 and S22smifphy pass0, pass1, pass2, pass3 netlist using Cadence Conformal tool. The logic equivalence check is studied and the same was performed on Rtltopass0 netlist as well as on other netlists. The results are analysed and the errors are reported and debugged properly.

Tool used (Development tools - H/w, S/w): Cadence Conformal LEC Low Power.

Objectives of the project: Logical Equivalence Check (LEC), Conformal Low Power Check (CLP)

Major learning outcomes: Debugging diff types of errors and how to fix them in minimum time by using cadence conformal tool (In RTL to GDS flow there are diff types of netlists on which we have to perform LEC and CLP so that we can check functionality check and Power check for complete flow).

Details of papers / patents: LEC and CLP memos for internal employees.

Brief description of working environment, expectations from the company: Yes, Everything is good in this company and I found best colleague who helped me always and special thanks to my manager, RB Rajavel and My Mentor, Raunak Mathur who helped me nicely.

Academic courses relevant to the project: Yes, Academic courses were very much helpful in my PS Project. Specially UPF related stuff and Regarding Low Power Methodologies.

Name: PRAKASH KUMAR OJHA (2020H1230249P)

Student write-up

PS-II project title: Early identification of clock reconvergence for clock tree latency reduction

Short summary of work done during PS-II: The project was related to finding out clock reconvergent points in a design using TCL script. PrimeTime commands were used to extract and identify driver pins, cells, their attributes and clock related information. The aim was to reduce tool runtime and clock tree latency network delay in the design.

Tool used (Development tools - H/w, S/w): HW Tool: Synopsys PrimeTime, HW Scripting language: TCL.

Objectives of the project: To make the task of checking reconvergent points automatic using TCL script and reduce tool runtime and Clock tree latency.

Major learning outcomes: Learnt about working of Synopsys PrimeTime Tool, STA advanced concepts and how to use TCL scripting in PT tool to automate a task and reduce latency.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment in my team at Infineon was great. Scheduled meets with mentor used to happen to track the progress and resolve doubts. The support from mentor and manager was consistent. Other team members were also supportive and resolved any doubts whenever contacted.

Academic courses relevant to the project: CAD for IC design, Digital VLSI Design.

Name: ASHUTOSH SUBUDHI (2020H1400224H)

Student write-up

PS-II project title: Graphical User Interface for SVAP platform

Short summary of work done during PS-II: The department allotted on the internship is the Validation department. The department comprises two sub departments named - Silicon Validation and Characterization. The internship training is carried out under the Silicon Validation department. The main tasks performed by the department includes pre and post silicon validation i.e. the validation of the silicon on the basis of digital and analog requirements of the customer. The project was to make an automation framework for silicon validation. The project is named as “Automation Framework for Silicon Validation”. The project is broadly divided into the following phases: 1. Porting, integration and testing 2. Database 3. Hardware Update 4. User interface.

Tool used (Development tools - H/w, S/w): Visual Studio.

Objectives of the project: Develop a Graphical User Interface for automation.

Major learning outcomes: I learnt Python Tkinter.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The seniors who were here were very helpful. They helped interns by solving their doubts.

Academic courses relevant to the project: Python

Name: AMAN KUMAR (2020H1400228H)

Student write-up

PS-II project title: Project based on verification in MXS40Sv2 platform / architecture

Short summary of work done during PS-II: There were three batches of one ongoing project. And I was suppose to clean the pass star errors of all three batches. So I added the switch in required file and later launch the regression for all batches differently.

Tool used (Development tools - H/w, S/w): VNC Viewer.

Objectives of the project: To get familiar with the verification methodology of Infineon.

Major learning outcomes: Got to know how the verification environment is created and how it is used to rectify the errors.

Details of papers / patents: NIL

Brief description of working environment, expectations from the company: Teammates are very helpful, and did not feel like any burden of deadline.

Academic courses relevant to the project: Verilog, Computer Architecture.

PS-II Station: InMobi - Software Development, Bengaluru

Faculty

Name: Mohammad Saleem J Bagewadi

Student

Name: SHEKHAR SHARMA (2018ABPS0250P)

Student write-up

PS-II project title: Account management

Short summary of work done during PS-II: Account Management - Taking complete responsibility for ensuring that the maximum performance is delivered for a campaign by coordinating with various stakeholders - Client, Sales Manager, Supply Team, Finance Team and Technical Team. Tasks include keeping a track of performance, revenue tracking, client services, problem solving and raising issues and action points to concerned POCs for the campaign.

Tool used (Development tools - H/w, S/w): Excel, PowerBI, MMP Reports, Internal Dashboard and Salesforce.

Objectives of the project: Delivering maximum performance for Ad campaigns by managing the campaign end to end.

Major learning outcomes: Stakeholders management - Proper direct and brief communication, Data analysis (Excel) - Campaign performance tracking and optimizing, taking ownership of the roles and challenges.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is really friendly and chill. There will be an opportunity for steep learning curve as the workload is high and you are expected to take ownership. People are extremely friendly and will help you out if you seek help for any doubts. Most of the work is divided within teams so crossfunctional and internal communication would be crucial. Only downside would be that sometimes workload may stretch your working hours but the challenges are exciting, people are fun and nice, lots to learn about the Ad-Tech Industry.

Academic courses relevant to the project: Any course with case studies / group projects / team communication would be useful.

PS-II Station: InMobi- Business Analyst, Bengaluru

Faculty

Name: Annapoorna Gopal

Student

Name: SHUBHENDU KUMAR TRIPATHI (2017B1A10433P)

Student write-up

PS-II project title: Backend development of IAP-API

Short summary of work done during PS-II: I was involved in the development of various APIs which were required in version 2 of the IAP-API website which is affiliate side platform of InMobi. Some of the APIs I worked on are: Changes made in affiliate offer to accommodate daily click caps data, Update of getAffiliateDetailsByOfferId API, Click Cap V2 IAP API changes I, Affiliate category list API, offer tag list API, Account manager GET API, Affiliate Available Status List API, Affiliate Recommendation API feature, Offer tag list API, Bundle ID API.

Tool used (Development tools - H/w, S/w): IDEA, Postman, DBeaver, GitHub, Docker, Kubernetes.

Objectives of the project: My main object was to build various APIs based on the needs of the team and assigned JIRA tickets.

Major learning outcomes: Learnt JAVA, Object Oriented Programming, SQL, Postman, Git, etc.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work culture of InMobi is really good. The mentors and manager were quite understanding and the team was very supportive as a whole. You can expect to get converted here if you are sincere enough. The compensation they offer is also really good if you are able to convert.

Academic courses relevant to the project: CP, OOP, DSA, DBMS.

Name: NALLAMILI SUMEDHA (2017B2A11467H)

Student write-up

PS-II project title: Account management - NA region

Short summary of work done during PS-II: In-depth analysis of various parameters of a campaign and reporting it to client.

Tool used (Development tools - H/w, S/w): Excel.

Objectives of the project: Address needs of different campaigns.

Major learning outcomes: Very deep understanding of Ad-tech industry.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Excellent work culture and very good mentorship.

Academic courses relevant to the project: NA

PS-II Station: Innovium, Bengaluru

Faculty

Name: Swapna S Kulkarni

Student

Name: PASURLA SNEHA (2020H1230321H)

Student write-up

PS-II project title: Implementation of APB and counter DUTs using UVM

Short summary of work done during PS-II: I learnt system verilog, SVA, networks, UVM with where used in building the testbench around 2 modules APB Protocol and Counter with multiport increment / decrement. I also wrote python script to capture different types of data from the log

files which gives information about the PVT corners of a chip. I also learnt using VCS tool, certitude tool.

Tool used (Development tools - H/w, S/w): VCS, Certitude, Python.

Objectives of the project: To build Testbench around the DUTs for verifying the modules for different test cases and corner cases.

Major learning outcomes: Able to recognise different cases and invalid states a design can go to if the constraints are not correctly designed.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The team is very approachable. They are expecting me to own a block by the end of December for verification.

Academic courses relevant to the project: yes

Name: SHANU KUMAR (2020H1230348H)

Student write-up

PS-II project title: Testbench implementation of Synchronous FIFO using UVM

Short summary of work done during PS-II: Wrote testbench in UVM and System Verilog, Wrote assertion for blocks in company product to see where there is unnecessary toggling so that power consumption can be reduced and ran regression across multiple blocks to test the assertion, wrote script in python to extract certain data like instance name where the assertions are failing from log file.

Tool used (Development tools - H/w, S/w): Eda Playground, Synopsis VCS, Linux, Python.

Objectives of the project: To have an understanding of the SV, UVM and how testbench, assertions are written, and what components are required in testbench architecture.

Major learning outcomes: UVM, System Verilog, Computer Networking, Python and Shell scripting.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is very much supportive and excellent.

Academic courses relevant to the project: YES

Name: CHIDARA SINDHUJA (2020H1400251H)

Student write-up

PS-II project title: Testbench implementation of APB protocol & counter DUT using UVM

Short summary of work done during PS-II: Developed testbench for APB protocol & the assigned DUT using UVM architecture in Synopsys VCS. Scripting task in python to automate certain things needed for the project and to generate wrapper files. Worked with certitude tool on certain blocks to model, activate and detect faults.

Tool used (Development tools - H/w, S/w): Synopsys VCS, EDA Playground, Python, Certitude.

Objectives of the project: To learn SV, UVM and how testbench, assertions are written and what components are required in testbench architecture.

Major learning outcomes: System Verilog, UVM, Computer Networking, Python, Shell scripting.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is good and the mentors/managers are approachable whenever in need.

Academic courses relevant to the project: yes

PS-II Station: Intel India Technology, Bengaluru

Faculty

Name: Swapna S Kulkarni

Student

Name: SHUBHAM SWATI PRASAD (2020H1030049G)

Student write-up

PS-II project title: Remote health check of hardware and software configurations

Short summary of work done during PS-II: There are numerous systems, and each system has different hardware and software configurations. Checking the configurations of each of these systems manually can be cumbersome. This project aims at writing a Python script to get the hardware and software configurations of different system and store them into XML and Json files. The information stored in these files will make it easier to compare the configurations of different systems and one can get the best-known configuration for a particular task. This project will reduce the manual work required to get the configuration of any system; hence it will help in automation.

Tool used (Development tools - H/w, S/w): Python, XML, JSON, GitHub, VNC viewer.

Objectives of the project: Writing a Python script for remotely getting the hardware and software configurations of a system and storing the values in XML files.

Major learning outcomes: Better understanding of computer architecture and organization, operating system, XML parsing, Version control using GitHub.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was positive and encouraging. Team was helpful. I was given the project and I was expected to give regular updates and complete the project before deadline.

Academic courses relevant to the project: Operating systems, Computer organization and architecture, Python.

Name: AYUSHI SHARMA (2020H1030157H)

Student write-up

PS-II project title: Enabling power management validation, automation for next generation Intel server platforms

Short summary of work done during PS-II: The title of the Project is "Enabling Power Management Validation, automation for next generation Intel Server Platforms" : In a typical Intel Xeon Server architecture, the platform software components, such as the bios, operating system etc, interacts with the hardware through control interfaces exposed for the purpose of system controllability and observability. The next generation Intel server platforms introduces newer control interfaces to help achieve this goal. This project will focus on building a much-needed validation infrastructure in windows server environment, which in turn will help validation teams to achieve the needed product quality. Worked on the automation of TCDs using Python and worked on creating a framework which helps to increase code readability and reduce code complexity.

Tool used (Development tools - H/w, S/w): JIRA,VNC Connet, Sublime Text Editor, Putty.

Objectives of the project: Focus on building a much-needed validation infrastructure in Windows/Linux Server environment, which in turn will help validation teams to achieve the needed product quality and maximize power efficiency.

Major learning outcomes: Understanding of Python and its inbuilt functions and modules. Basic understanding of tools used in the testcase definitions. Understanding of Simics simulator and able to create simics containers, launch and boot a virtual target in the container, Communicate to the simics target from an external machine, and Validate basic automation flows for the content.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Intel offers a great working environment, team members are very helping and supportive.

Academic courses relevant to the project: Advanced Computer Architecture, Advanced Operating, Python.

Name: SOURABH SUMAN (2020H1030178H)

Student write-up

PS-II project title: Auto Setup of Xeon Server Host

Short summary of work done during PS-II: The project focused on automating the test cases which will verify the test product and improve the assurance of the automation and also helps in provisioning of the automation host. The project will focus on writing the automation script in the Python language and installing that script on the SUT (system under test) which will help in automating the task of the user to install the required automation tools as on when required by the user in terms of making their system ready for the use.

Tool used (Development tools - H/w, S/w): S/w-Pycharm.

Objectives of the project: To automate the task of installing the required tool to make the automation framework ready to work.

Major learning outcomes: Understanding of the operating system and computer architecture and how to communicate with the OS using the programming languages here I used Python. Understanding of Python in deep was the outcomes of the project.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment at intel is very good and supportive. For the new employee and the interns they help to get used to the work and also to the new environment.

Academic courses relevant to the project: Operating system, Computer Architecture.

PS-II Station: Inzpera Healthsciences Ltd., Mumbai

Faculty

Name: Bharathi R

Student

Name: SANIKA ARUN PARASNIS (2018A5PS1113H)

Student write-up

PS-II project title: Identification and evaluation of novel opportunities in the nutraceuticals space for the management of diabetes / associated conditions in the metabolic space

Short summary of work done during PS-II: The project concentrated on a diabetic and metabolic diseases portfolio where my work centered around the initial stages of new product development. This includes studying the diseases and complications in this project's context: Diabetic Retinopathy and Diabetic foot ulcer. The work included the disease understanding concerning prevalence, etiology, current treatment management, need gap analysis, idea evaluation concerning the identification of gaps, product/s idea, published data backup, current marketed products and commercial assessment of the identified idea (primary market research) & forecasting. These objectives were carried out mainly through the evaluation of published literature, the study of disease models, analysis of market data provided by the company and conducting RCPA (Retail chemist prescription audit) and idea analysis with doctors and chemists.

Tool used (Development tools - H/w, S/w): Microsoft office, Excel, Word, Powerpoint.

Objectives of the project: The objective of this project was to develop a deep understanding of how actives work in Type 2 diabetes and its related complications, analysis of published clinical data, assessment of competitors, market opportunity and some basic primary market research.

Major learning outcomes: The project imparted multiple important skills such as understanding the health care market, market and competitor analysis, idea evaluation and exposure to the new product development value chain.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The company has a great working environment with extremely supportive seniors and executives. The work is great for anyone planning to continue to work in a healthsciences or the pharmaceutical companies.

Academic courses relevant to the project: Pathophysiology, anatomy and physiology, pharmacology.

PS-II Station: IQVIA, Bengaluru

Faculty

Name: Bharathi R

Student

Name: SAI KRISHNA C (2020H1410167P)

Student write-up

PS-II project title: Interoperability

Short summary of work done during PS-II: Did deep analysis of orgs of 3 different applications and identified conflicts for the common custom objects. Learnt how to maintain a CRM platform using salesforce. Saw closely how Apex triggers work and how to write classes and methods in apex. Learnt SOQL command lines to modify data. Learnt how HTML and Javascript work.

Tool used (Development tools - H/w, S/w): Salesforce, VS Code, Apex language, Javascript, html, SOQL.

Objectives of the project: Combining 3 applications from 3 different orgs to 1 single org.

Major learning outcomes: How to manage conflicting validation rules, sharing settings, page layouts in salesforce when merging orgs. Use salesforce to develop apps.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: WFH over entire duration. No work pressure. flexible location for full time employees.

Academic courses relevant to the project: NA

Name: PATEL RUSHIL RAJENDRAKUMAR (2020H1420198P)

Student write-up

PS-II project title: Effectively manage customer relationships using salesforce admin and developer user interface

Short summary of work done during PS-II: I have primarily worked on the different areas of Salesforce User Interface admin and developer, data processing and data extraction in order to facilitate further testing of different functionalities and modifications.

Tool used (Development tools - H/w, S/w): Salesforce CRM Environment, Microsoft Excel, Visual Studio Code, JIRA.

Objectives of the project: The objective of this project is to make use of state-of-the-art Machine Learning technologies, primarily Natural Language Processing in order to extract meaningful information contained in the documents to reduce the efforts of the customer-facing employ.

Major learning outcomes: Gained knowledge about latest technologies in Machine Learning and Artificial Intelligence, valuable insights of implementation of those technologies in real world problems, gained some basic level skills of project management, coordination and execution, basics of developer concepts.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is collaborative and encouraging. The colleagues and mentors were very friendly and approachable.

Academic courses relevant to the project: NA

Name: SHETE DHANASHRI DHANANJAY (2020H1460359P)

Student write-up

PS-II project title: Registration landscape in Saudi Arabia

Short summary of work done during PS-II: Data collection on various stakeholders who are working in health and finance department in Gulf countries (Qatar and Bahrain) from official websites and various publicly available research articles. Secondary Desk Research for Dentistry Market in African countries (South Africa, Kenya, Nigeria, Ghana). Data collection on Registration landscape in Saudi Arabia by secondary desk research using various official websites like MoH, SFDA, NUPCO or other publicly available research articles.

Tool used (Development tools - H/w, S/w): Ms Word, Ms excel, Ms PPT.

Objectives of the project: To understand detailed registration process in Saudi Arabia including prerequisites for registration, key stakeholders who manage or control pharmaceutical registration, step-by-step process for registration with mapping of stakeholders involved at each point.

Major learning outcomes: Detailed registration landscape in Saudi Arabia including each and every step involved in registration process.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: IQVIA is an American multinational company serving the combined industries of health information technology and clinical research. Working Hours of the organization is 10:00 AM to 7:00 PM. The people working in the organization is very supportive, able to recognize the hardwork, Co-operative. Team members always encourage each other and share their ideas. Good communication between the team members also between the team manger and team members.

They also conduct weekly team meetings to discuss the things happening in the organization. Facilitate opportunities for learning by using various tools like learning edge, linked In.

Academic courses relevant to the project: Quality Assurance and Regulatory Affairs.

Name: DESHMUKH AMEY PRADEEP (2020H1460372H)

Student write-up

PS-II project title: Charting and quality check of slides under brand impact

Short summary of work done during PS-II: 1. Request for proposal from client, followed by preparing a proposal that addresses business context, objective, timeline etc. 2. Preparation for Questions for survey. 3. Collection of data from primary source (Doctors, physicians, nurses etc.) 4. Chart that data to already prepared ghost pack (Blank charts). 5. Finally quality check the data.

Tool used (Development tools - H/w, S/w): PIDC TOOL, PowerPoint, Excel.

Objectives of the project: To convert statistically difficult data to understandable format.

Major learning outcomes: How to do survey, communication skills and etiquette, group discussion.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Working environment in IQVIA is best I have ever seen, as all the team members help each other in every aspect whether it is related to work or unofficial. People here are so enthusiastic in every task so you also feel very energetic everytime u go to the office. Team leads and manager are so reachable like you can go any time prior informing them and they will be available for any concern. It is so positive, happy and healthy environment for one who is seeking for better future.

Academic courses relevant to the project: Actually my background is pharmacy so use of technical things were not that much but yes the Microsoft tools which I used in master's were useful for me in this non core work. Apart from that the communication course I done in my 1st semester was also somuch helpful.

Name: ROHAN SHESHRAO SABLE (2020H1460383H)

Student write-up

PS-II project title: Charting and stat testing under PIDC reporting team

Short summary of work done during PS-II: As a reporting analyst I'am contributing in making Ghostpack (which is a outline of the final presentation) contributing in creating the charts internally or with our vendor to create charts that best depict the data. Also working on intermediate deliverable that typical includes charted responses for a subset of questions providing quick reads of important questions finalizing the presentations and generate key insights and recommendations for the clients welfare currently handling various projects of Astrazeneca, Pfizer, GSK, Gladerma, etc.

Tool used (Development tools - H/w, S/w): Excel, Powerpoint, Outlook, Microsoft Teams.

Objectives of the project: Primary Statistical data is difficult to read and interpret so it should be converted to visually interesting and easy to understand form, this will help us to achieve spending efficiencies (total cost saving), get more value from primary and secondary data.

Major learning outcomes: Major learning outcomes are how to do Ghostpacking, formatting of reports, Charting and Stat testing of the data, custom Calculations, Open-end coding, Quality control and Tools include Microsoft Team,Smartsheet, Powerpoint, Excel, and Outlook.

Also improvement in oral and written communication.

Learnt to explore the difference between domestic and international market.

Understood the role of marketing research, its significance and characheristics.

Overall in depth knowdlege of custom market research.

Details of papers / patents: No papers and patents

Brief description of working environment, expectations from the company: 1) The working environment is very much flexible so you can work from office as well as from home, its not compulsory to walk into office except tuesday and thursday

2) They always focus on training and developement of employee like,

Hard skills- knowledge of a new database management system.

Soft skills-interpersonal skills which could affect the morale of the organization.

3) They always shower praises whenever needed so it felt more motivated towards work.

4) Team work is great here- you never felt alone while working on project people are always there to support and help you no matter what timing is it.

5) The environment is full of courage as they always ask you and support youn to do out of box things.

6) They also provided us with Linkdin learning so as to learn more that will help to flourish our career in long run.

Academic courses relevant to the project: Yes they are relevant.

Name: DIKSHA MISHRA (2020H1530362P)

Student write-up

PS-II project title: Registration landscape in United Arab Emirates (UAE)

Short summary of work done during PS-II: Developed skills with learning edge courses and tools offered by IQVIA. Using secondary research compiled top specialties of 50 Pharmaceutical and 10 medical device companies and framed White paper introduction. Primary research compilation in power point presentation format for an ongoing project. Prepared Teaser report from provided Deck Report. In-depth secondary, light primary research and online learning courses for preparation of detailed report on pharmaceutical product registration procedure in United Arab Emirates.

Tool used (Development tools - H/w, S/w): Microsoft Word, Excel, and Power point.

Objectives of the project: To understand detailed registration process in UAE including pre-requisites for registration, key stakeholders who manage or control pharmaceutical product registration, stepwise mapping of stakeholders involved in each process, Broad timeline for each product.

Major learning outcomes: The study targets pharmaceutical companies who are planning to launch their products in UAE by guiding them on registration landscape in Emirates. All data collected will be framed into a play book which will provide clear understanding about registration procedure, stakeholders involved, pricing policy and reimbursement in UAE.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: IQVIA holds a very healthy and productive working environment. There is no such designation gap everyone is free to express their opinions and views. There are weekly meeting in teams to discuss agendas or how is work going, any challenges. The internship is work from home still its functioning very smoothly. We take part in webinars, meetings, sessions etc. From Department Principal to immediate colleague all are willing to help.

Academic courses relevant to the project: Some aspects are covered related to Quality Assurance and Regulatory Affairs.

PS-II Station: Jacobs, Gurugram

Faculty

Name: Mahesh K Hamirwasia

Student

Name: MANE SHIVAM SUNIL (2020H1300057H)

Student write-up

PS-II project title: Pavement engineering for highway projects in UK region

Short summary of work done during PS-II: In the context of UK region guidelines provided by Design Manual for Roads and Bridges (DMRB) and Manual of Contract Documents for Highway Works (MCHW) are used for conducting calculation of various parameters in pavement engineering such as calculation of design traffic, calculation of pavement foundation thickness, new pavement design thickness and estimation of required inputs for pavement maintenance along with the specifications on materials to be used and their QA/QC procedure. The work / tasks incorporated in this report involves: □ Analysis of road core samples in respect to check the presence of tar and core dimensions. □ Calculation of design traffic for new pavement design and/or maintenance schemes. □ Calculation of pavement foundation thickness considering appropriate design approach. □ Calculation of new pavement design thickness. □ Calculation of Polished Stone Value (PSV) and Aggregate Abrasion Value (AAV) for available traffic data by considering appropriate site categories.

Tool used (Development tools - H/w, S/w): Microsoft Excel , ELMOD 6.

Objectives of the project: To get accustomed with the design practices in pavement engineering field with respect to the client and learning the documentation or representation of the work. To work on the skills required to work on the live projects and provide a more better solution.

Major learning outcomes: Well versed with the pavement design procedure and term related to it mostly probably in the UK region.

Insights from the design standards (DMRB) clarified the pavement design aspects to more extent.

Global experience on working for dummy projects in UK region.

Enhancement of technical knowledge regarding pavement engineering and applying the same to provide solutions to the team which gave a confidence.

Improved mail etiquettes conversing with the colleagues and manager.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Jacobs has a helpful and more systematic work culture. Any new joiner may be intern or a full time employee , thorough attention is being paid at him/her in order to impart knowledge and culture of sharing knowledge within. Jacobs also deals with Global Integrated Delivery (GID) which involves multi office project execution that deals working with talent force around the world to deliver global solutions locally and clustering of global practices. Thus sharing of knowledge globally gives more specific approach to provide a solution. Company expects the new joiner to be sound in basic knowledge required to absorb the work procedure and new design aspects if any . Company has offices situated globally and also the clients from different countries. Thus in order to communicate with them inter-personal skills and good command in English is must. Overall minimum basic knowledge in relevant field is enough to get absorbed in the company very soon.

Academic courses relevant to the project: Pavement Material Characterization (CE G534), Highway Construction Technology (CE G570) Pavement Analysis and Design (CE G518) and Pavement Maintenance (CE G548).

PS-II Station: Jacobs, Mumbai

Faculty

Name: Pavan Kumar Potdar

Student

Name: NAMITHA MENON (2020H1300056H)

Student write-up

PS-II project title: Geometric design of Highways

Short summary of work done during PS-II: Sample survey file was given and I was asked to design create surface, alignment, profile, corridor and volume report for the data.

Tool used (Development tools - H/w, S/w): Civi 3D.

Objectives of the project: To have a understanding of DMRB codes and geometric design of Highways.

Major learning outcomes: Exposure to civil 3D.

Details of papers / patents: None

Brief description of working environment, expectations from the company: It was work from home with contact from organisation through citrix. MS teams was the medium of communication. I was allotted a manager and he was the point of contact. He introduced me to DMRB codes and designing of highways in civil 3D. It was a great learning experience.

Academic courses relevant to the project: Yes. Highway geometric design was taught to us in the first semester of Masters program.

Name: DANISH QURESHI (2020H1300062H)

Student write-up**PS-II project title: Highway Designer Internship**

Short summary of work done during PS-II: Getting the exposure to design methodologies used in different regions accross the world. Studying design manuals to arrive at parameters for road geometric design and make use of such parameters in design software civil 3D to arrive at road models.

Tool used (Development tools - H/w, S/w): Civil 3D.

Objectives of the project: To learn the design methodologies used in designs of highways and other roads.

Major learning outcomes: To use specifications and design software for arriving at the outcome of design of roads and highways.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Jacobs provides a good working environment to work, with supportive staff and an inclusive culture.

Academic courses relevant to the project: Highway geometric design.

Name: MALLA V H NARAYANA SUBUDHI (2020H1410090G)

Student write-up

PS-II project title: Literature survey on mathematical modelling and simulation of the road transportation applications and determination of correlation between the scaled bodies

Short summary of work done during PS-II: I did 2 projects, 1st is the Literature Survey on Mathematical modelling and simulation of the road transportation applications. Where I did literature survey on effects on the RTU during road transport. the random vibrations are severe in nature compared to all other effects on RTU. In Random vibrations, Vertical vibrations causes more damage compared to Lateral and longitudinal vibrations. I developed a dynamic vibration model of RTU on truck. I gave input excitations such as random vibration and sinusoidal input due to road surface. I interpreted the results for different masses and stiffness of the system. The results matches with the basic dynamic principles. In 2nd project, I determined the correlation between the scaled bodies by considering the dam example. I created a model and prototype with equal scaling ratio for all dimensions. I calculated the equivalent stress for different water levels

in both model and prototype. It is observed that there is a correlation between the model and prototype. By this relation, one can predict the larger response of a body by simulating/experimenting the small scale body for time being and material consumption is less.

Tool used (Development tools - H/w, S/w): Simulink, Ansys Workbench.

Objectives of the project: To develop the mathematical modelling and simulation of random vibrations and determination of correlation between scaled bodies.

Major learning outcomes: I learned about random vibrations and its properties. The behavior of the RTU road transportation system is interpreted for different input variables. Determined the relation between modal and prototype and Learnt about the pros and cons of scaling.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment at Johnson Controls is good. My Manager gave new project and he made us learn and develop it and the doubts regarding software tools got cleared with the help of colleagues in the company.

Academic courses relevant to the project: Dynamics and vibrations.

PS-II Station: Johnson Controls, Pune

Faculty

Name: R S Reosekar

Student

Name: NANDULA GOUTHAM SAI (2020H1410196H)

Student write-up

PS-II project title: Literature survey on mathematical modelling and simulation analysis of the road transportation applications and scaling law, determination of correlation between the scaled bodies

Short summary of work done during PS-II: Johnson Controls International is an American Irish-domiciled multinational company, where the project concentrates on the RTU units, random vibrations, scaling of the components and getting a correlation between the original and prototype scaled down version using the scaling laws and self-weight analysis of the exhaust fan assembly. In these projects mainly deals with the products of the company and analysis and simulation of the components.

Tool used (Development tools - H/w, S/w): Ansys work bench, space claim.

Objectives of the project: To have a brief idea of how a RTU unit works, How scaling effects and its applications and also mainly to use the Ansys workbench software like how to simulate the static structural, model analysis.

Major learning outcomes: Ansys work bench software, scaling and its applications and how to deal with larger bodies, gaining knowledge on the random vibrations and RTU units and also about methods in road transportation applications for safe safe transfer of the units.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Johnson controls working environment is soo good and everyone in the company and in the team I have worked are very helpful. They have helped us to complete all the three projects in time. I have been allocated to FEA team where all the people are very experienced and they have a brief knowledge in the subject as well as the software.

Academic courses relevant to the project: CAAD, FEM, DYNAMICS AND VIBRATIONS.

Name: SAMBA MAHESH (2020H1410198H)

Student write-up

PS-II project title: Excel based fatigue life calculator

Short summary of work done during PS-II: Fatigue is the initiation and propagation of a material crack due to cyclic loading. Present work involves a theoretical understanding of estimating fatigue life. With the help of several reference books (for ex, Machine Design by Shigley, Books written by Ali-Fatemi, V.B. Bhandari, etc.), research papers. Preparing a generalized flow chart and fatigue life calculator using Excel VBA prevents this sudden failure.

Tool used (Development tools - H/w, S/w): EXCEL VBA (Visual basic for applications).

Objectives of the project: (1) Estimation of Fatigue life with the inclusion of recent developments. (2) Preparing Flowcharts and developing a generalized Excel-based (VBA) Fatigue life calculator.

Major learning outcomes: Learning outcomes of this project includes fatigue failure and how this mode of failure is different from other failure modes, severity and consequences of this catastrophic failure if we ignore fatigue. Methodologies and several criteria and theories have been studied carefully to estimate the fatigue life and prepare generalized flow charts and excel based fatigue life calculators.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Excellent working surroundings with flexibility and for the duration of the guidance.

Academic courses relevant to the project: Material science and design of machine elements.

PS-II Station: JPMC – GR & C CCB Risk - Loss forecasting 1, Bengaluru

Faculty

Name: Shekhar Rajagopalan

Student

Name: SMRITI PRAKASH (2018A4PS0045P)

Student write-up

PS-II project title: Streamlining BAU and Automation

Short summary of work done during PS-II: Please note that Chase is a Consumer Bank and my team works on the loss forecasting for loans lent to end consumers in the States. If you're comfortable with commercial consumer banking and interested in understanding how financing houses work, this role might interest you. Amazing work life balance and the team highly prioritizes time off and good mental health. Would highly recommend all CCB Risk teams if you're interested in honing technical skills while employing bare minimum financial know how to rectify it.

Tool used (Development tools - H/w, S/w): Excel majorly, VBA, SAS, SQL and Tableau.

Objectives of the project: Most of the work is fairly routine and redundant. The aim was to completely revamp and automate the processes to save a couple of man hours. Additionally, tools including programming languages and visualization tools were employed to streamline walks.

Major learning outcomes: The home lending division runs on very stringent rules and directions by the Fed to avoid another financial meltdown similar to the 2008 crisis. Learning the nitty gritty of mortgage financing are critical.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Can self adjust pace. Depends on yours as well as the team's goal and whether they're aligned. Great balance, amazing people and the company prefers students working from the office. If this is your first office experience, there's a lot to learn.

Academic courses relevant to the project: Basics of POE and CP.

Name: DHAMMAPADA MOHAPATRA (2018A4PS0634H)

Student write-up

PS-II project title: Auto loss forecasting

Short summary of work done during PS-II: I have worked on various loss forecasting activities to determine the allowance for auto lease. I also worked on various Macro Economic Variables and estimated their impact on loss reserve calculations.

Tool used (Development tools - H/w, S/w): Ms Excel, SAS.

Objectives of the project: The objective of the project is to determine auto lease loss reserve accounting for various scenarios of Macro Economic Variables.

Major learning outcomes: I understood various loss forecasting exercise performed during a complete financial cycle. I also got deeper insights of macro economic variable (like unemployment rate, etc.) and their impact on loss forecasting.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is quite friendly and professional. The workplace is highly comfortable and adequate services and facilities are available for the employees to work hassle free.

Academic courses relevant to the project: Courses like Principle of Economics (ECON F211), Fundamentals of Financial Accounting (ECON F212), Probability and Statistics (MATH F113), have helped me a lot in understanding the project in a better way.

PS-II Station: JPMC – GR & C Model Risk Governance and Review- COO, Mumbai

Faculty

Name: Saikishor Jangiti

Student

Name: NAYAN JAIN (2018A7PS0173P)

Student write-up

PS-II project title: Ranked Retrieval System

Short summary of work done during PS-II: I built a complete full stack application from scratch. This included building the web page for my search engine, building an api server which handled user queries efficiently, and also storing the data structures in the NOSQL database effectively. I had to combine multiple existing information retrieval algorithms in order to come up with one that suited the document dataset. I also did some additional small, independent tasks including code migration to Tornado.

Tool used (Development tools - H/w, S/w): Python (Tornado), React, TypeScript, JavaScript, HTML.

Objectives of the project: To build a small scale search engine for internal documents. Customizing the algorithm to improve over time.

Major learning outcomes: Full Stack Web Application Development.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working style in JPMC is really great. The whole team is really helpful and supportive. You not only learn a lot but also have fun. The workload is really low.

Academic courses relevant to the project: Information Retrieval, Data Structures and Algorithms.

PS-II Station: JPMC- CIB R&A WP - Global Trade & Loan Products, Mumbai

Faculty

Name: Saikishor Jangiti

Student

Name: SANKET AGRAWAL (2017B3AA0628G)

Student write-up

PS-II project title: Global trade & loan products

Short summary of work done during PS-II: Worked on BAU, making powerpoint and bit of Excel work.

Tool used (Development tools - H/w, S/w): PPT, Excel, JP Morgan internal tools.

Objectives of the project: Work on Supply Chain Finance.

Major learning outcomes: Excel, Supply Chain Finance, PowerPoint.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Excellent team, very supportive colleagues.

Academic courses relevant to the project: None

PS-II Station: JPMC GR&C - CCB Risk - Loss Forecasting 2, Bengaluru

Faculty

Name: Mohammad Saleem J Bagewadi

Student

Name: VARKEYCHAN JACOB (2017B5A70828P)

Student write-up

PS-II project title: Migration to Amazon cloud

Short summary of work done during PS-II: The team was going to replace all existing tools which use local servers to Amazon cloud based tools. In the new platform historic data as well as procedures to run the codes which generates monthly data were to be created. This is for the analytics that the team does, based upon which various parameters are set for the operation of the firm.

Tool used (Development tools - H/w, S/w): Redshift, SQL Workbench/J, Sublime Text.

Objectives of the project: Migrating data from local servers to Amazon cloud.

Major learning outcomes: SQL, Redshift.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Good work environment and a very supportive team.

Academic courses relevant to the project: Database Systems.

Name: ANKIT GOYAL (2017B5A70905P)

Student write-up

PS-II project title: Transformation function

Short summary of work done during PS-II: The problem that I have been assigned is Transformation function. I talk and have meetings with various teams all across the JP Morgan, understand their functioning, what are the parameters that they use and how those parameters are calculated. I, then think about how these processes can be automated, optimized or is there any redundancy that can be removed to make the process more efficient and time saving.

Tool used (Development tools - H/w, S/w): Alteryx, Tableau, Jupyter Notebook.

Objectives of the project: To automate the report building process.

Major learning outcomes: I worked on a real-life problem and solved it to make the lives of people easy. The automation I have build will save a lot of time for my team.

Details of papers / patents: None as such.

Brief description of working environment, expectations from the company: Before my joining to firm, my team used to calculate various parameters for the firm's decision making process. The parameters are escalated to higher position people for understanding the current market scenario and making important financial and investment decisions for the firm. These parameters are very crucial and my team calculates them manually using excel. They used to first filter the excel sheet, used to ask Managing Director(MD) about what parameters were required and from which date and then calculate them. They would then manually pick up rows and columns and then apply formulas in excel to calculate the parameters. All this process used to take a lot of time and energy. Moreover, due to manually doing this process , the parameter were calculated after some delayed period of time. There were chances of error making which could cause heavy losses due to wrong decision making based on these parameters. Due to delayed parameter calculation, decision making meetings were also delayed and as a result everyone had to suffer. The management asked my team to automate this process so that the parameters can be calculated quickly which will help save time and help make decisions quickly. I am working on this automation process to help my team to calculate these parameters quickly, easily, efficiently and most importantly accurately.

Academic courses relevant to the project: Data Structures and Algorithms.

Name: ROHITAAS BERI (2018A7PS0147G)

Student write-up

PS-II project title: Risk forecasting

Short summary of work done during PS-II: My team was aligned with CCB (Consumer and Community Banking), and is called CCB Risk. We analyze the various risks that arise in CCB, namely Cards Risk, Auto Risk, Credit Risk, Business Banking Risk. The project allotted to me by my manager is under Auto Risk, and is called Loss Forecasting or Risk Forecasting. The target is to predict the amount of risk in the Auto sector that we can take and that is sustainable and profitable at the same time, also known as Risk Appetite. I am working closely with Fang Suidong (Michael) , He is my project lead, and works in the U.S.I am currently aligned to work in the U.S. timings , which is from 1 PM IST to 10 PM IST. The codebase is currently written in SAS language, an internal DBMS tool used till now by the CCB Risk organization. But now, as we are changing our codebase from SAS to SQL, My project goal is to convert the codes of SAS EG to SQL. The databases of the Automobiles lent out as loan are Oracle based, so the organization decided that using SQL to query the information would better fit and be more efficient.

Tool used (Development tools - H/w, S/w): SAS, SQL, Excel.

Objectives of the project: The target is to predict the amount of risk in the Auto sector that we can take and that is sustainable and profitable at the same time, also known as Risk Appetite.

Major learning outcomes: Corporate responsibilities, corporate culture, industry best practices, DBMS basics, and advanced techniques, SQL, Oracle DB , Scripting etc.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: We have regular meets regarding work, fun activities when apt, Inter-Division meets, etc. We recently changed our work type from WFH (Work From Home) to RTTO (Return to the Office). I currently work in Bangalore, at Prestige Tech Park, in the Electra building, and have work onsite on Tuesday, Wednesday and Friday. My manager, Abhinav Rajvanshy, is an excellent leader, and also a great person to talk to in general. I am really learning, and enjoying my internship here at JPMC and would like to thank the PS2 division for giving me such a wonderful opportunity.

Academic courses relevant to the project: DBMS, CP, PoE.

Name: DEEPANKAR SHARMA (2020H1030162H)

Student write-up

PS-II project title: Work on Emerging Risk, Behaviour Normalisation and Consumer Health Cash Buffer

Short summary of work done during PS-II: 1) Created and monitored different mechanisms of detecting emerging risks including but not limited to delinquency, loss and roll rate trends, forecast misses and breakages in correlations. 2) Performed analysis and interpretation of financial data and its impact in consumer credit performance, strategy, and other operational/financial areas. 3) Created Outside-In views of consumer credit including partnerships with Credit Bureaus for off us Credit information and Econometric firms such as Moody's. 4) Performed ad-hoc analytics to research credit trends, understand their drivers, and conducted impact assessments on consumer credit portfolios.

Tool used (Development tools - H/w, S/w): SAS, Hive, Teradata SQL, Python, Tableau, Microsoft Office.

Objectives of the project: The major objective of it was to understand the emerging risk, and what a financial institution must be aware of that can arise/affect them/consumers in the future.

Major learning outcomes: Understood the macroeconomic factors and how they affect the consumers, figured out how a financial institution works from a risk side and the perspective of what goes into monitoring the emerging risk parameters.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Work Environment is quite good, friendly, teams are very supportive, though work can get daunting sometimes with hard deadlines.

Academic courses relevant to the project: Mathematics, Financial Risk Analytics and Management.

PS-II Station: JPMC GR&C - CCB Risk -Business Banking, Bengaluru

Faculty

Name: Sidharth Mishra

Student

Name: JHA DEEPTANK VINODKUMAR (2018A1PS0078H)

Student write-up

PS-II project title: SAS to Alteryx automation

Short summary of work done during PS-II: Worked on Tableau dashboard enhancement, Created various dashboard on adhoc requirements. Supported team for BAUs. Automated Excel process for report creation in Tableau. Worked on classification issues in data using Python and Alteryx. Automated code from SAS to Alteryx workflow. Built SQL scripts for Teradata database.

Tool used (Development tools - H/w, S/w): SQL , SAS, Alteryx, Tableau, Python.

Objectives of the project: To support CCB Risk Auto reporting team in terms of BAU, Adhocs and with automation of manual process and reports.

Major learning outcomes: Enhanced SQL, SAS, Alteryx, Tableau, Python skills for various data analytics processes.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work culture is very good, with a lot of learning opportunities. Everyone is very helpful and encourages to work forward.

Academic courses relevant to the project: Derivatives and Risk Management, Fundamentals of Finance, Security Analysis and Portfolio Management, Business Analysis and Valuation, Financial Management.

PS-II Station: JPMC GR&C - CCB Risk -HL Risk - Data Strategy & Execution, Bengaluru

Faculty

Name: Mohammad Saleem J Bagewadi

Student

Name: AAKASH BANSAL (2018AAPS0418H)

Student write-up

PS-II project title: Data analytics and automation - Home lending

Short summary of work done during PS-II: Data analytics projects included finding accurate data, filtering, processing and presenting. Automation included converting SAS queries to python, and providing one click solutions to 2-3 day long manual processes.

Tool used (Development tools - H/w, S/w): Toad, Teradata, Enterprise Guide, Jupyter Notebooks, Alteryx.

Objectives of the project: Data analytics, Automation.

Major learning outcomes: Python, business knowledge about mortgage banking, Alteryx, SAS, SQL.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very calm and supportive work environment, no one is over worked but the work hours in CCB are 2-10 pm.

Academic courses relevant to the project: NA

PS-II Station: JPMC GR & C CCB Risk - Auto Risk Strategy Analytics, Mumbai

Faculty

Name: Sidharth Mishra

Student

Name: ABHRAJIT SARKAR (2017B2AB0893P)

Student write-up

PS-II project title: Data analytics - Auto loans credit risk

Short summary of work done during PS-II: I was in the Auto originations team mainly handling the auto loans credit risk and delinquency using different metrics and parameters. The nature of the work was combination of adhoc and daily. It mainly required analysis and representation of data and results achieved through various models, reporting and strategy building through simulation based on policy changes in US auto market.

Tool used (Development tools - H/w, S/w): SAS/SQL, Excel.

Objectives of the project: None

Major learning outcomes: Auto Markets in US, Credit risk and policy, Loan and lending.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work environment was very supportive and helpful. Every team member from associate to top management in US, were easy to approach and understanding both on professional and personal level. The team also comprises of multiple Bitsians, so that's another plus point. Besides there are substantial vacancies in the team, so anyone eyeing for PPO should take a note. It's pretty chill out here and sort work life balance.

Academic courses relevant to the project: FoFA, BAV, DRM, SAPM.

PS-II Station: JPMC GR & C Model Risk Governance and Review - CCT, Mumbai

Faculty

Name: Saikishor Jangiti

Student

Name: ISHA SETHI (2018A7PS1017G)

Student write-up

PS-II project title: Web Development - Frontend and Backend

Short summary of work done during PS-II: I worked on multiple projects. Added new features to existing Model Risk Team applications. I fixed bugs as and when they came up. Worked on various tasks such as automatic email generating, creating reports, studying new code.

Tool used (Development tools - H/w, S/w): Python, JavaScript, HTML, CSS, Tornado.
Worked on the proprietary Athena Studio version of Visual Studio Code.

Objectives of the project: Worked on existing tools used by the team. Fixed bugs, added new features.

Major learning outcomes: Team work, working with proprietary software, understanding huge amounts of code.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Work life balance was great and the team is extremely approachable. Work was manageable, would be given enough time to complete each task and the team helped with anything that was required. Got enough time to learn skills that were required.

Academic courses relevant to the project: DSA, DBMS, OOP.

PS-II Station: JPMS - Corporate Risk - LERR & CTC Liquidity Risk Reporting (Finance), Bengaluru

Faculty

Name: Shekhar Rajagopalan

Student

Name: ANIKA BAIRATHI (2016HS490733P)

Student write-up

PS-II project title: Market and credit risk management

Short summary of work done during PS-II: Making reports, validating and publishing them on daily and monthly basis.

Tool used (Development tools - H/w, S/w): Advanced Excel, Adobe Acrobat.

Objectives of the project: Working on BAUs.

Major learning outcomes: Understanding of risk, VaR, stress.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Great place to work in. Environment is nice and motivating.

Academic courses relevant to the project: Derivatives and risk management.

PS-II Station: JPMS CIB R&A Banking(CRG)-Banking, Mumbai

Faculty

Name: Shekhar Rajagopalan

Student

Name: AKSHAT JOSHI (2017B2A11381H)

Student write-up

PS-II project title: IPO Pitch for Siemens unlisted segment

Short summary of work done during PS-II: Mostly worked on pitchbooks and convertible bond financing in Asian Markets.

Tool used (Development tools - H/w, S/w): Bloomberg, PowerPoint, Excel.

Objectives of the project: To value Siemens' unlisted segments and prepare an IPO pitch dek.

Major learning outcomes: Learnt how equity capital markets and financing works in Asian markets and how banks act as middlemen for corporations to raise financing.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Interns are expected to work exactly like full time employees. Similar responsibility levels and work hours.

Academic courses relevant to the project: DRM, BAV.

Name: SHREYA GUPTA (2018ABPS0601P)

Student write-up

PS-II project title: Analysis of real estate industry, Asia pacific region

Short summary of work done during PS-II: Initially the work revolved around updating comparables on a bi-weekly basis. Later my work involved shadowing analysts and helping them with various projects. Towards the end of the internship, I was only aligned to a few onshore front end investment banker in the Asia-Pacific region directly fulfilling their requests. I have also gotten the opportunity to work across regions in North America, Australia and Asia understanding the difference of the sector with geographical diversity.

Tool used (Development tools - H/w, S/w): Skype, Bloomberg, Thomson, Eikon, Outlook, Excel, Powerpoint, PitchPro and a few other company specific softwares.

Objectives of the project: Understand the metrics that are relevant to the Real Estate industry and to investment banking in general. To financially evaluate any deal that happens in the RE industry and understand the implications it has.

Major learning outcomes:

- 1) Learnt advanced excel and macros
- 2) Learnt financial modelling and valuations for any Mergers, Equity Capital Market and Debt Capital Market
- 3) Made sell side pitches for major execution deals
- 4) Directly fulfilling onshore banker requests
- 5) How the real estate sector varies from one region to another

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Investment banking is a demanding job. J.P. Morgan CRG Banking expects you to put in the required amount of time in the job. People are very friendly here and they help you to navigate the difficulties you face while working. Sincere work is expected out of the interns however no one expects you to have an understanding of financial concepts. Everything is taught from the scratch right from the

trainings to solving complex valuations for different companies. The learning curve is great here and people are really supportive in terms of anything you would want to learn from them.

Academic courses relevant to the project: DRM, BAV, Fundafin.

PS-II Station: JPMS CIB R & A Data Science, Bengaluru

Faculty

Name: Saikishor Jangiti

Student

Name: PIYUSH MAHESHWARI (2018A7PS0153G)

Student write-up

PS-II project title: Regulatory change AI

Short summary of work done during PS-II: Worked on ML models around regulatory change management. Experimented with different text feature-extraction techniques, ML models, post-processing of raw model scores, etc. Trained models for tasks like multi-label classification and retrieving similar documents. Developed API endpoints to serve the trained models for prediction on new data. Also contributed to the design and implementation of an internal ML library. At the end, I had to document all of my experiments and contributions in detail.

Tool used (Development tools - H/w, S/w): Python, FastAPI.

Objectives of the project: Develop a one-stop solution for regulatory change management, potentially replacing/combining all existing projects at some point.

Major learning outcomes: Training and evaluating ML models, hyper parameter tuning, text preprocessing steps, feature extraction from text and categorical data, library and API development, documenting experiments and product.

Details of papers / patents: None

Brief description of working environment, expectations from the company: I got ownership of the product, was at the centre of discussions and decision-making. The idea was already under consideration before I joined, so I was provided with an overview and a set of requirements. The pace of work was not too fast. In the initial period, there was enough time for any experiments with different models etc, but later it became more about the deliverables. The ML part of the projects was usually pretty basic. There is some focus on explainability of the models, so DL models weren't commonly used apart from running experiments. My team worked from 1-2 pm to 9-10 pm IST for easier collaboration with the US team.

Academic courses relevant to the project: FDS, ML, NLP, NNFL can be useful.

Name: ASHRYA AGRAWAL (2018A7PS0210P)

Student write-up

PS-II project title: Anomaly detection in regulatory reporting

Short summary of work done during PS-II: JP Morgan Chase & Co. is a multinational company with several businesses engaging in a variety of financial services and instruments. This leads to a vast amount of data that needs to be processed at multiple levels before being reported to regulatory authorities. It is essential that this reported data is free of errors and anomalies. Failure to do so poses a reputation risk and the possibility of fines by regulators. As a part of the regulatory reporting team in the applied AI/ML group, I am working towards solving this by detecting anomalies using Data Science before reporting data to the regulatory authorities. The work spans two projects: Supervised classification and volume check. While currently unsupervised data science approaches are being used, I am working towards developing supervised approaches

which use Anomaly labels to train the model. The first proof-of-concept I have developed consists of a decision tree that receives preprocessed features after various encodings. The ML model and pipeline achieve impressive results, which shall be further improved during the remaining course of the project. In the second project, anomalies are detected in the volumes of transactions. We find these anomalies by identifying a group of patterns exhibiting similar behavior. Patterns behaving differently than other patterns in their groups are marked as anomalies.

Tool used (Development tools - H/w, S/w): Pyspark, Hadoop, Pandas, Numpy, Sklearn.

Objectives of the project: Detecting anomalies in volumes of transactions reported to regulatory authorities; supervised detection of anomalies.

Major learning outcomes: 1. Learnt more about AI in finance and various applications of AI in finance industry 2. Gained experience of working in pyspark and tabular data 3. Improved presentation skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: JP Morgan's AI-ML division has a very good working environment, with a proper work-life balance, and a friendly and helping environment. As we mostly work with large datasets, the code takes hours to run. During this time you are free to do whatever you wish (watch sports on phone perhaps xD). My manager and team took my work very seriously (in a good sense). I was given opportunities to present my RnD work to business operations, higher management and even entire AI-ML team of JP Morgan. Its truly rare to find teams where interns are trusted with such important responsibilities!!

Academic courses relevant to the project: Foundations of Data Science, Artificial Intelligence, Machine Learning, Applied Statistical Methods.

Name: ASHISH ASTHANA (2018A7PS0239P)

Student write-up

PS-II project title: Market Ops control metrics

Short summary of work done during PS-II: The project required enhancing the business legacy approach of calculating metric thresholds. 2 enhancements were made: 1. add flexibility to hard thresholds using bootstrapping 2. take into account temporal behaviour of series and predict better thresholds. After this enhancement Tableau dashboards were prepared for viewing these thresholds with the series and other summary reports in a more clean, detailed manner.

Tool used (Development tools - H/w, S/w): Python, Pandas, Tableau, Arch.

Objectives of the project: Make data driven enhancement to threshold computation and add Tableau visualization for easier analysis.

Major learning outcomes: Statistical methods like bootstrap sampling, working with ARIMA/SARIMA models, Tableau dashboard creation.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: It was a good experience overall. My manager was supportive and involved. I mostly had work from home but went to visit office for 1-2 weeks. Working hours were flexible to an extent and there wasn't any major work pressure.

Academic courses relevant to the project: Artificial Intelligence, Probability and Statistics, Machine Learning.

Name: VARUN PARTHASARATHY (2017B3A70515H)

Student write-up

PS-II project title: Identifying anomalies in transaction data

Short summary of work done during PS-II: The task was to develop several checks that could be applied to incoming data as rules in order to detect anomalies. There were different kinds of checks designed for different attributes present in transaction data. For example, attributes like quantity can have checks for which quantity attribute was filled, a check for the trend over time etc. I built pipelines to automate the generation of rules for these types of checks. Another issue is how to resolve anomalies that have already been identified (such anomalies are called exceptions). Normally these exceptions are manually processed and rectified; but considering the sheer volume of transactions that occur on a daily basis this is clearly not feasible. Thus I have begun work on this task by using historical data in order to propose a solution for rectifying incorrect transactions.

Tool used (Development tools - H/w, S/w): Apache Spark, Python, Numpy, Pandas.

Objectives of the project: JP Morgan deals with hundreds of thousands of transactions every day, trading various securities on the market. The global financial crisis of 2008-09 was primarily influenced by excessive risk-taking by financial institutions and the burst of the United markets.

Major learning outcomes: PySpark, handling big data, revision of data mining concepts.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Working environment was very nice. The expectations from the company were not extremely heavy - there was a good work-life balance and the pressure placed on me was not very high. My co-workers were very friendly and supportive and assisted me whenever I had any issues.

Academic courses relevant to the project: Machine learning, Data mining.

PS-II Station: JPMS CIB R & A Data Science, Mumbai

Faculty

Name: Mohammad Saleem J Bagewadi

Student

Name: SIVARAMAN KARTHIK RANGASAI (2017B4A71499H)

Student write-up

PS-II project title: Control metrics

Short summary of work done during PS-II: The project started with a PoC automation implementation of the existing control charts method for computation of the risk metrics of the firm. After this it moved on to test and find out usage of Bootstrapping and Time series approach to solve the issue. This was also aided with data visualization approaches to learn the insights.

Tool used (Development tools - H/w, S/w): Python, Tableau, Pandas, Numpy.

Objectives of the project: End to end automation risk control computation and visualisation.

Major learning outcomes: Tableau, Control Charts methods, use of time series.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Very helpful and encouraging environment.

Academic courses relevant to the project: Applied Statistical Methods.

PS-II Station: JPMS CIB R & A Global Research, Mumbai

Faculty

Name: Shekhar Rajagopalan

Student

Name: P PRAKASH REDDY (2017B3AA0663H)

Student write-up

PS-II project title: Quantitative & Derivatives strategy

Short summary of work done during PS-II: I worked on ETF handbook, did daily and weekly runs of the existing project, currently working on US stock Performance driver's project. The ETF handbook is like bible for investors who are interested in ETF (Exchange Traded Funds) investments. The daily/weekly runs are published to subscribed clients, the performance drivers project currently I am a part of is soon going to become monthly publication.

Tool used (Development tools - H/w, S/w): Python, SQL, Excel, Bloomberg.

Objectives of the project: Made analysis of ETFs(Exchange Traded Funds) in Asia Region. which provides detailed analysis of worldwide ETFsteam), did daily and weekly runs of the existing projects, these are published to subscribed clients on Morgan Markets website.

Major learning outcomes: In Quantitative derivatives & strategy team, I learnt about the importance of the financial instrument ETF, stock performance analysis and importance of daily and weekly publications.

Details of papers / patents: Classified information, It would be against the norms of JP Morgan to disclose the Papers and I didn't get any patents in the meanwhile.

Brief description of working environment, expectations from the company: Working environment is great, everyone is so passionate and hardworking. Easily approachable. I collaborated with 5 different teams, never had a bad time.

Academic courses relevant to the project: I don't specify a single course in my case because I used quite a bit of excel to get things done. I learnt using excel shortcuts and functions gradually in my under graduation, whether it be from the finance courses or economics courses.

PS-II Station: JPMS GR & C - CCB Risk - Cards Strategy, Bengaluru

Faculty

Name: Shekhar Rajagopalan

Student

Name: MALIGIREDDY AKASH REDDY (2017B3AA0914H)

Student write-up

PS-II project title: Unstructured payments analysis

Short summary of work done during PS-II: The unstructured payment analysis project is targeted towards increasing the application volumes by shifting the customers who make an unstructured payment into programs of structured payments like BLP, settlement. Based on the

charge-off rate of 25% which is an annual loss rate for BLP programs, we have segmented around 380K customers into few pockets of opportunities. Firstly, we have segmented each bucket based on the 'segmentation' of the customer like cure, payer, non payer, engaged etc. And we also segment the customers based on the long-term risk score bands with each band being 0.1 in length from 0 to 1. Then, the charge-off rates for each of the above segments is calculated and the segments with charge-off rates higher than 25% are suggested to put into a payment program so as to get the marginal loss benefit. Using this segmentation, we have identified that we can shift approximately 34K customers into applications and using the loss benefit rate of 4.5% (overall loss rate of 34K customers-25%), we estimate the annual impact to be ~\$2 Million loss benefit. We also can increase the program enrollment rate which will further increase the loss benefits. This model is in development phase and is yet to be discussed with the senior leaders.

Tool used (Development tools - H/w, S/w): SAS, Excel.

Objectives of the project: To increase the customer base of payment programs.

Major learning outcomes: SAS, Strategy analytics, Excel, SQL.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is pretty comfortable. The mentors and managers are very aware of the markets and the business. Technically a bit limiting, but business learnings are quite large.

Academic courses relevant to the project : NA

PS-II Station: JPMS GR & C AM Risk Analytics, Bengaluru

Faculty

Name: Sidharth Mishra

Student

Name: AAKASH SHANKAR (2018A4PS0517P)

Student write-up

PS-II project title: GR & C AM risk analytics – Market risk (Bengaluru)

Short summary of work done during PS-II: 1) BAU - This involved i. Report generation (I was responsible for generating 2 weekly reports and correcting any mistakes on tableau) ii. Checks (I was responsible for 3 checks - PV & Sensitivity check, FSI check and Liquidity risk check) iii. Adhoc requests (Carrying out any adhoc requests. This could involve changing account metrics on the central repository - Newton, querying certain requirements on SQL, updating some information, etc.) 2. Automation Project - I worked on a python code to automate the entire Liquidity check (an end to end reduction of about 60 mins in processing time).

Tool used (Development tools - H/w, S/w): Tableau, SQL, Python, MS Excel, MS Powerpoint, Newton (JPM proprietary software).

Objectives of the project: To carry out BAU work (including report generation, weekly checks and adhoc requests) & Carrying out an automation project on one of the checks.

Major learning outcomes: Learnt about the different kinds of risk (like investment risk, liquidity risk, counterparty risk, etc.), understood how Investment banks like JPM manage this risk. Gained knowledge about stress testing and VAR.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Excellent work environment. The team is very supportive and helpful. The manager is very understanding. You don't have to know Python and SQL before joining - you can learn it at the start of the internship.

8-9 working hours per day (very relaxed) and can work on your own time. The offices in Bangalore are great with recreational rooms and cafeterias. While the team is very relaxed, they expect you to work hard. Don't take their relaxed nature for granted. Put in your best effort and reach out to people when you need help.

Academic courses relevant to the project: DRM, SAPM, Financial Management.

PS-II Station: JPMS GR & C Credit Forecasting Strategy, Bengaluru

Faculty

Name: Sidharth Mishra

Student

Name: YASH GOENKA (2017B2A40746G)

Student write-up

PS-II project title: Loss forecasting - Cards

Short summary of work done during PS-II: Analysis of financials to determine valuation benefits and reserve build for future losses.

Tool used (Development tools - H/w, S/w): MS Excel, Internal company tools, OmniAI.

Objectives of the project: Analyse the financials and develop a model in order to increase the overall value of the company.

Major learning outcomes: Got technical and functional understanding of how things work in practical world, functioning of retail banking and allowance builds.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Good work culture and the mentor was very supportive through out the duration of the internship.

Academic courses relevant to the project: PoE

Name: AAKASH AGRAWAL (2017B2A40889P)

Student write-up

PS-II project title: Risk appetite - Home lending

Short summary of work done during PS-II: Made of use tools to judge the risk scenario of the firm with respect to home lending. This exercise is carried out every quarter and a wholistic analysis is carried out based on the results.

Tool used (Development tools - H/w, S/w): SAS, SQL, MS Excel.

Objectives of the project: To analyze the level of risk taken by the company with respect to home lending.

Major learning outcomes: Risk, types of risk, Home lending framework, SAS, SQL, Excel, etc

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work environment/culture is one of the best that I have seen. You are treated with utmost respect and

given a lot of freedom. All that is expected is that you take responsibility and finish your work on time. The working hours or the expectations from the company side aren't extreme.

Academic courses relevant to the project: BAV, SAPM, Fundamentals of Finance & Accounting.

PS-II Station: JPMS GR & C CTC Market Risk, Mumbai

Faculty

Name: Shekhar Rajagopalan

Student

Name: NAIVEDYA KRISHN (2018A2PS0230H)

Student write-up

PS-II project title: Market risk management of securitized products

Short summary of work done during PS-II: Worked on different Securitized Products like CLO, CMBS, ABS, RMBS etc. Learnt about their structure, how they work how are they affected when the market changes, then focused on the different market risk metrics to quantify this risk, understood their significance and how they change based on different factors like rates etc.

Tool used (Development tools - H/w, S/w): VBA, BLOOMBERG, Tableau.

Objectives of the project: To learn about the different market risk metrics and understand their significance.

Major learning outcomes: Learnt about the different securitized products and their market risk metrics how they change based on market moves.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The people here are really hard working, welcoming and highly inclusive always ready to help even with small doubts.

Academic courses relevant to the project: FRAM

PS-II Station: JPMS GR & C Quantitative Research - Fintech, Mumbai

Faculty

Name: Saikishor Jangiti

Student

Name: SWAPNIL AHLAWAT (2018A7PS0178G)

Student write-up

PS-II project title: Virtual Memory Solution for Large Portfolios

Short summary of work done during PS-II: The Wholesale Credit Risk team implements and executes calculators on various Portfolios and assesses risks involved per loan. Some of these portfolios are very large and running calculators on them exceeds the RAM size. The past solution involved manually partitioning the portfolio and performing the operations on a subset of data.

Through this project, we developed a drop-in replacement library (replacing NumPy) to represent portfolios, that allows calculators to run on portfolios that exceed the RAM size.

Tool used (Development tools - H/w, S/w): Python, IntelliJ, Git, NumPy, Pandas, Pytest.

Objectives of the project: Develop a drop-in replacement library for representing portfolios, that'll allow model developers to execute calculators on portfolios that exceed the RAM size.

Major learning outcomes: 1. Learnt how to develop a Python library from scratch.
2. Learnt how to use virtual memory to represent data greater than the RAM size.
3. Learnt about Abstract Syntax Tree and its usage in lazy evaluation.

Details of papers / patents: The work is in development stage and is supposed to be open-source contribution from the company.

Brief description of working environment, expectations from the company: Note: The working environment is highly dependent on which team you're in. The working hours for me were flexible and my team only cared about the amount of work I did and not how much time I stayed online. The manager and the mentor are always there for your help, and coming from the tech background, you get ample time to learn financial aspects of the project. As mine was a research project, the expectations from the project were not fixed. But for others, there was a well laid-out plan for the internship that they were expected to follow.

Academic courses relevant to the project: Object Oriented Programming, Operating Systems, Data Structures & Algorithms.

Name: ADARSH NANDANWAR (2018A7PS0396G)

Student write-up

PS-II project title: Trade Analytics Tool for the EMEA region

Short summary of work done during PS-II: Worked in the Cash Equities, Quantitative Research team in JPMorgan Towers, Mumbai. Throughout the internship, I worked on many projects, out of which Trade Analytics Tool for the EMEA region was the main project. Trade Analytics Tool (TAT) is an application that the traders use to see critical business-related data and information. For instance, accurate revenue, loss, commissions, and PnL numbers. The tool presents a huge amount of unintuitive data in an easy-to-understand and well-structured format. Using the Trade Analytics Tool, the user can analyze and dissect each individual trade flow in just a few clicks. The project involved working on huge codebases with thousands of lines of code with complicated calculations, huge amount of data analysis, aggregations and visualization, cleaning and verifying critical information by challenging existing systems and drilling down into anomalies, understanding business logic by engaging with the traders and stakeholders in Europe and, finally, software development. Other projects involved python software development, enhancing existing projects with new features, and basic machine learning. Since we perform transformations on a huge volume of data, you are expected to write very efficient Python code. This might need knowledge of multi-processing and operating systems. Good knowledge of database systems is also needed. The databases used in my team are column vectorized databases optimized for time-series data, for which Q language needs to be learned.

Tool used (Development tools - H/w, S/w): Python, KDB+, Q Language, Visual Studio Enterprise, Jupyter Notebook.

Objectives of the project: Build trade analytics tool for EMEA region to view critical business-related data in equity business.

Major learning outcomes: While working at JPMorgan, I improved my data analysis skills a lot. Got to apply operating systems and database systems concepts to solve real-world problems. Learned to write high-quality production code with unit tests. Gained unique professional communication and presentation experience by working with foreign senior members on a daily basis. I also learned about the work environment in the fintech space and how quants work. Learned a lot about the business from the regular employee training sessions.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Very positive work environment. The PS2 was in an offline mode and we were expected to work from the office. You will be allotted mentors in case you need any help. All members of the quantitative research division are very helpful, knowledgeable, and among the best in their fields. Expect a slight learning curve in terms of the business (if you don't have finance knowledge) and the development environment, as it is proprietary and internal to JPMorgan. You are expected to have full ownership of the software you worked on. Good communication skills are needed as you will work with teams spanning across multiple countries. I worked with members from New York, London, Hong Kong, and Mumbai. This might result in odd working hours based on workload.

Academic courses relevant to the project: Computer Programming, Data Structures and Algorithms, Database Systems, Operating Systems, Data Analysis.

Name: MIR AMEEN MOHIDEEN (2018A7PS0487H)

Student write-up

PS-II project title: Intraday tools and model optimizations

Short summary of work done during PS-II: I worked on a number of projects, 3 of them were on adding significant features to intraday tools. The frontend and backend were written using python libraries. My other projects were on optimizing models(pricing, funding models). All the models are written in python and numpy and pandas were used heavily in the code. Learned many optimization techniques like vectorization, caching etc.

Tool used (Development tools - H/w, S/w): Python, Visual studio, Database (JP Morgan proprietary), Numpy, Pandas.

Objectives of the project: To add significant features to various intraday tools and to optimize models.

Major learning outcomes: Improved my skills in Python, Numpy, Pandas. Learnt to handle and manipulate financial and time series data. Learnt to use parallel computing framework. Learnt various financial concepts like backtesting, hedging etc

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The work environment is great, everyone is helpful and approachable. You can approach anyone with your doubts and you will get help.

Academic courses relevant to the project: OOPS, Database, DSA, Machine Learning.

Name: NIPUN WAHI (2018A7PS0966H)

Student write-up

PS-II project title: Ladder Instruments

Short summary of work done during PS-II: I was given tasks to implement models which calculate the curvature of instruments wrt index,etfs and their corresponding underlying like stocks bonds currencies. All these followed a similar framework to be implemented from scratch. These numbers would be used for capital charge calculations which the bank has to keep for regulatory reasons.

Tool used (Development tools - H/w, S/w): Python

Objectives of the project: Need to create ladder instruments for different jobs like equities, fx, bonds etc.

Major learning outcomes: Learnt about python, finance and how the banks have to follow regulations.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment was very good and the people were very helpful. The company met all the expectations.

Academic courses relevant to the project: Data structures and algorithms, Object Oriented Programming, Operating System.

PS-II Station: Kafqa, Bengaluru

Faculty

Name: Febin A Vahab

Student

Name: SHUBHANK JAIN (2018A2PS0104P)

Student write-up

PS-II project title: Managing Products and Product Features to Fulfil Customer Needs and Meet Business Goals

Short summary of work done during PS-II: To summarize, most of the projects that I worked on involved customer acquisition and retention. The features that I worked on include - free trial account experience, autopayments, self-service admissions etc. The "Free trial account experience" product feature helped in customer acquisition by providing a trial version of our services to the customers. The autopayments feature increased the ease of making payments by automating the instalment collection. The "Self Service Admissions" feature allowed the

customers to select the appropriate batch dates and timings themselves instead of talking to a sales agent.

Tool used (Development tools - H/w, S/w): Microsoft Excel, Google Data Studio, Metabase.

Objectives of the project: The objective of the project was to manage different product features in order to create a positive customer experience and meet business goals. Different product features that were handled by me include - Self Service admissions, free trial account experience.

Major learning outcomes: During the implementation of the "Free Trials Account" feature, I learned how important it is to rigorously test the feature before deployment and I also learned how to think critically in order to cover every use case. While we were using the "Autopayments" feature, I learned how important it is to make the customers aware of the feature being offered, otherwise they might feel uneasy while using the feature. While working on the "Self Service Admission" feature I learned how important it is to hit a fine balance in providing different choices to the customer. If a lot of choices (in this case, choice of class timings) are given then this creates confusion while if very less options are given then the customers may not find suitable and preferable options for themselves.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is good. Everybody is willing to help and collaborate if the need is properly communicated. I had expected the company would provide me a rich working experience which it did.

Academic courses relevant to the project: Professional Ethics, Technical report writing.

Name: SHARMA RITVIK MANOJ KUMAR (2018A4PS0001G)

Student write-up

PS-II project title: Managing and improving the products for creating a better customer experience

Short summary of work done during PS-II: I worked on different products which were engaged with service delivery. As a growing startup the company automated a lot of processes which were initially started manually. I witnessed and managed those automations and meanwhile learning the basics of working in a company.

Tool used (Development tools - H/w, S/w): Microsoft Excel, Metabase, Google Data Studio, Django, WhatsApp Analytics.

Objectives of the project: Managing and improving the internal tools that company is using for operations.

Major learning outcomes: Management, Designing, etc.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is fine. The company is expected to grow much more.

Academic courses relevant to the project: Business Communication and Professional Ethics.

Name: RISHABH PANDEY (2018AAPS0342G)

Student write-up

PS-II project title: Managing Products and CRM Platform and its Impact on Business

Short summary of work done during PS-II: The CRM is an integral part in the working of Kafka and is used by many departments, a part of my work was involved in handling any issues faced by each department on a daily basis, create new automations or alter existing automations to

accommodate new features and changed SOP (Steps of Procedure) of sales agents as well as handling smooth integration of any new product into the CRM. Along with that that I handled the customer inflow metrics and if there was any fluctuation in the metrics, I did root cause analysis. I also suggested changes in the company website, landing pages and made products (major part of my work) that improved customer inflow. These new products involve link sharing experience, expired leads and finally creating a whole CRM platform for the company. This project helped me understand from the very root as to a how a company operates, what is the structure behind creating and implementing products, how to work under pressure and how to make precise business decisions based on data analytics. The products i made in this project helped the organisation free trial attendance increase by 10%, resulting in more customer inflow. Also my product helped in making the internal working of the company smoother and improving the quality of leads(potential customers) that the sales agents get. Besides that my CRM In-Housing product removed their dependency from third party vendor (Leadsquared) saving them Rs 46,00,000 this year.

Tool used (Development tools - H/w, S/w): Leadsquared, Notion, Metabase.

Objectives of the project: The objective of the project was to handle the CRM of the organisation while adjusting it according to the new products launched by the company. At the same time keeping track of the customer inflow metrics and improving it by launching new products.

Major learning outcomes: This project helped me understand from the very root as to a how a company operates, what is the structure behind creating and implementing products, how to work under pressure and how to make precise business decisions based on data analytics.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Decent working environment.

Academic courses relevant to the project: NA

PS-II Station: Knowzies Technology Solutions, Pune

Faculty

Name: Mohammad Saleem J Bagewadi

Student

Name: JHASHAMSU GUDIMELLA (2017B4A21022H)

Student write-up

PS-II project title: Using technological methods in the realm of education services and automation testing using selenium

Short summary of work done during PS-II: Made several presentations on various negative effects students and employees face in a hostel setting / job setting. Worked on an aptitude test as well as a feedback form for students. Made a selenium automation framework and ran test cases as well.

Tool used (Development tools - H/w, S/w): Java, Selenium, HTML.

Objectives of the project: Made several presentations on various negative effects students and employees face in a hostel setting/job setting. Worked on an aptitude test as well as a feedback form for students. Made a selenium automation framework and ran test cases as well.

Major learning outcomes: I have gotten real experience using Java, HTML, and got to know more about the front and back and aspects of development. Along with using the Eclipse IDE to utilize the selenium framework.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: I had colleagues I could engage with in a productive manner and instructors who had my back.

Academic courses relevant to the project: Computer Science

PS-II Station: KPMG, Bengaluru

Faculty

Name: Sandeep Kayastha

Student

Name: PRATHMESH KUMAR TIWARI (2020H1490834P)

Student write-up

PS-II project title: Competitive intelligence related to various sectors and services

Short summary of work done during PS-II: I joined the organization on 17th January 2022. After completion of necessary onboarding procedures, submission of requested documents, and completion of other formal tasks, I was assigned as a Business Associate Intern in the Global Collaboration & Knowledge (GC&K) team. In the recent months of internship, I was associated with the Competitive Intelligence (CI) team within Global Collaboration & Knowledge team. As an intern, my daily tasks included working on client deliverables, providing assistance in the process of research, creating project decks, creating data sheets with required collected data, and more. My work till date includes extensive usage of MS Powerpoint for deck creation and MS Excel for data collection and analysis, including other secondary research sources and research databases. During my internship period, I was a part of 8 major projects and 4 support projects.

Tool used (Development tools - H/w, S/w): Microsoft PowerPoint, Microsoft Excel, Microsoft Word, Secondary Research Tools, Research Databases.

Objectives of the project: 1. To ensure understanding of client needs; 2. To ensure effective implementation of research frameworks; 3. To deliver high quality and error free work; 4. To build an internal understanding of the field of work for further effectiveness.

Major learning outcomes: During my internship duration, I was able to effectively implement my learnings during my Masters. Furthermore, I was also able to build up my skills regarding competitive intelligence, understanding client needs, building effective understanding of project requirements, effective team and personal communication, effective time management and interpersonal skills.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment of KPMG Global Services (KGS) is highly professional in nature with a focus on employee needs and satisfaction. The organization provided me with various learning opportunities during my internship period. For example, the organization conducted a Bootcamp session for all the new joiners wherein professionals from within the company conducted learning sessions regarding important skills/software/tools that are required for daily day-to-day tasks. These sessions were paired with a simulation exercise wherein teams were to implement their learnings from the bootcamp in the form of a live project.

Furthermore, during my internship period, my manager, colleagues, and senior leadership regularly interacted with me and made sure that the entire duration was proceeding smoothly for me. At the end of the internship, I have a stronger understanding of technical skills required for the internship as well as learning non-technical skills required in the organization.

Academic courses relevant to the project: 1. Marketing Research and Metrics 2. Critical and Design Thinking 3. Product & Brand Management 4. Strategic Marketing 5. Introduction to Systems and Sustainability.

Name: ADARSH MAKHOLIA (2020H1490835P)

Student write-up

PS-II project title: US auto sector healthmonitors; US packaging sector HMs, US transportation sector HMs

Short summary of work done during PS-II: I was part of the research and bench-marking hub of the KPMG Global services, tagged to the US geography. My work was primarily related to the secondary research along bench marking. Every single piece of task, project, or section I was undertook helped in the decision making process at the higher level of the organisation. The health monitors, I helped my team with, were the important and confidential Industry reports, which were served to important Industry players of the US by KPMG partner firms. I was able to draft important sections related to the M&A analysis, writing and paraphrasing the Industry news, working on important tools like Think cell and Power Bi to draft important charts and statistics. The projects all in all helped me in starting off with my corporate journey, I was able to utilize important learnings from my MBA course at BITS Pilani, in the value creation for the firm.

Tool used (Development tools - H/w, S/w): MS office. PowerBI, Thinkcell.

Objectives of the project: The projects are client serving documents which are to be delivered after every 20 days. These confidential documents help the KPMG partner firms to achieve important corporate objectives.

Major learning outcomes: 1) Hands-on experience on MS office - Tools like pivoting, data visualization, charting on Excel, formation client ready decks as per the company norms.
2) Introduction to important databases from Standard & Poor, Thomson One, Pitch book, etc.
3) Team work, business writing, presentation styles and client facing discussions.

Details of papers / patents: No published papers, the projects were chargeable (highly confidential to the client firms).

Brief description of working environment, expectations from the company: The firm sets an excellent example of the inclusive work culture and ethos across the entire corporate advisory

industry. KPMG is considered to be a BIG 4 firm with a strong reputation, extremely positive and nurturing work culture. The firm is very particular about the knowledge, insights, advisory and experience it sells to its clients. The work culture in the org. promotes self and peer learning, it helps an individual to explore his/her interests and passion in the professional life. The company expects an individual to be passionate about learning and to have a sense of pride and honesty towards the organization.

Academic courses relevant to the project: Business Analytics, Strategic Management, Decision Making, Corporate Finance, Strategic Marketing, Marketing and Metrics.

Name: DIVYANSHU SINGH (2020H1490837P)

Student write-up

PS-II project title: To analyse the market situation for a particular firm and based on that providing solutions

Short summary of work done during PS-II: We were working with the mid and senior level management team who were directly interacting with the clients and based on their requirements we used to do our research which could help the management in pitching the client about the suggestion and improvement they can have.

Tool used (Development tools - H/w, S/w): Multiple software tools were used. CapitalIQ, ThomsonOne, Merger Market, Nexis, Refinitive.

Objectives of the project: Objectives were to find out the required financial and other data for a particular firm as per clients demand and then providing the analysis based on that data.

Major learning outcomes: How consulting is being done and how an exhaustive research and data can add on value to consulting.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was very friendly and we were provided all the guidance.

Academic courses relevant to the project: Yes many subjects like Business Analysis and Valuation and Market Research were very relevant to the internship.

Name: SRIKAR DESIKAN PURANAM HOSUDURG (2020H1490849P)

Student write-up

PS-II project title: Projects undertook and skills learnt at KPMG global services

Short summary of work done during PS-II: I was mostly involved in projects related to Market scanning, Geographic assessments and finally in profile creation projects.

Tool used (Development tools - H/w, S/w): Microsoft Powerpoint, Excel, Word and Power BI.

Objectives of the project: To leverage the learnings of my course to work towards gathering insights to tackle business problems.

Major learning outcomes: 1. Business writing 2. The company's style guides for report making 3. Basic Power BI 4. Gathering data and insights from Financial reports 5. Secondary research using company specific databases.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The best part of working in KPMG Global Services is the rapport that the senior management plans to have with all the employees in the organisation. The weekly huddles that occur on a broader and narrower team scale are the best events to put yourself forward and engage with your fellow colleagues. The company expects from its employees top notch report making, insightful data collection and data collation in a manner in which the clients can articulate the given information or solution to

the problem statement. KPMG focuses more on accuracy of the company guidelines and adherence to client deadlines.

Academic courses relevant to the project: The academic courses from my curriculum that were relevant to the work I was allocated are Marketing Research and Metrics, Corporate Finance, Consumer Behaviour, Critical and Design Thinking, Managerial Economics, Business Analytics and Statistics.

PS-II Station: Larsen & Toubro Infotech, Bengaluru

Faculty

Name: Chennupati Rakesh Prasanna

Student

Name: PRASAD A (2018A4PS0625H)

Student write-up

PS-II project title: IT ticketing data visualisation on VUE JS framework (based on front end app development)

Short summary of work done during PS-II: An introduction to front end web development and the concepts involved in its applications. • The different languages and frameworks used in the project like HTML, CSS, JS; their latest versions, features and modifications and how they could be used efficiently to create applications. • A brief mention of the different frameworks available and their uses and applications. • The responsibilities and objectives associated with a web developer during the course of the projects and the necessary requirements and updates needed for better project executions. • The differences between front end and back end web development

giving us an idea of how the two have different definitions, understandings and functions and how both are used together to create the application that the user requires in the end and to make the application as user friendly as possible. • The tasks and objectives associated with the project and some of the applications of the major charts executed in real life and how they could be used as a part of a much more complex, higher level execution / application. • The challenges during the course of the project, ideas and knowledge gained on the concept of front end web development were the major highlights of the project. • The various javascript frameworks, their differences, the software packages invoked and used, the webpage being an extremely fascinating framework used to create millions of applications of diverse backgrounds, the procedures and complex working behind the codes written by both front end and back end web developers, the understanding of the flowchart behind the working of the applications were some of the major ideas gained which could act as the solid base needed for future applications.

Tool used (Development tools - H/w, S/w): Visual Studio Code, Microsoft Edge, npm and d3 packages.

Objectives of the project: To execute, visualise and analyse data from different kinds of charts executed and to also execute standard user friendly applications and modify dynamic data according to user's requirements.

Major learning outcomes: Webpage creation using Angular JS, Vue JS, creating mini timer games, user defined changes of dynamic data and creation of posts, rendering charts and user required data with appropriate colours and background.

Details of papers / patents: NIL

Brief description of working environment, expectations from the company: The working environment was in online mode throughout the course of five months, Outlook mail was used for the communication purposes regarding the stipend, password notifications, task details and other notifications. Microsoft Teams was used for chats and calls between me and my Senior Product Engineer. The working hours of the company were from 10 to 7 PM. Overall a wonderful environment to explore the fascinating concept of web development and using webpages to create applications which are very useful in our daily lives and can act as the base / tools for higher level IT projects. As a part of a team meant to execute data visualisation charts for further

analysis of critical data, it was an interesting challenge to invoke various inbuilt packages and instead of importing them directly from the internet, it can be invoked locally via using the import statements, learning about the various syntax / runtime errors, the differences between the codes in various javascript frameworks and so on. It was also on learning about the differences between the various charts executed, its functions in different sectors and which chart to be used in each sector and for what sort of data too was realised and accordingly worked upon. A small mini timer game too was created where the user had to click on the button and based on the response, the time taken for the response and a rank based on the response too was displayed on the screen. A lot of help from their side too was given regarding the tasks and their understandings and the doubts too were solved at regular intervals, thereby acquiring a good knowledge on the subject. Punctuality, proper reporting, progress on tasks, a bit of self learning from the student's side too was a part of the company's expectations. Overall an extremely fresh atmosphere with a clarity on the processes were a part of the learning experience. Last but not the least, an extremely great place for a six month internship.

Academic courses relevant to the project : Front End Web Development, Data Science.

Name: DEEPANKAR PRADHAN (2020H1060212P)

Student write-up

PS-II project title: Test case optimization using Recommender system

Short summary of work done during PS-II: Test case optimization is the process of filtering out the most suitable subset of test cases to be conducted eventually from the entire test suite. Optimizing test cases aids in meeting two important constraints namely time and budget in software testing to enhance the fault detection rate as early as possible. This results in us finding the problem earlier due to improved fault detection rate at early stage and delivering the system in a brief period. To accomplish the above said, recommender systems come in handy for building such systems. The methods and algorithms developed in this work are primarily focused on regional and full regression testing methods. The outcome of the work proves to be beneficial in terms of test suite reduction and semantic meaning conservation accuracy.

Tool used (Development tools - H/w, S/w): VS Code, Jupyter Notebooks, Google Collab, Azure Machine Learning Services.

Objectives of the project: Regression testing are a critical part of software development lifecycle. It is carried out whenever there is change in any part of the software. The problem is it takes lot of time and delays the SDLC. Recommendation based on some optimization.

Major learning outcomes: Machine Learning Algorithms, Recommender Systems, Natural Language Processing, Data Handling, Optimization.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The project was doable by work from home. Company allows individual to conduct own research and bring out unique solutions. Reasonable solutions are praised and considered by the company. Feedbacks are provided in case there is some scope of improvement. Self driven interest is more required to keep it up while working here.

Academic courses relevant to the project: NA

PS-II Station: Larsen & Toubro Infotech, Chennai

Faculty

Name: Chennupati Rakesh Prasanna

Student

Name: PRANAV G (2018AAPS0334H)

Student write-up

PS-II project title: QGenie, a chat bot powered by Machine Learning

Short summary of work done during PS-II: I worked on the development of the website for QGenie, starting from frontend, backend, some workflows upto making an implementation document for it.

Tool used (Development tools - H/w, S/w): Django, MongoDB, VS Code, NoSQLBooster, Anaconda.

Objectives of the project: Develop a website for the chat bot QGenie, for explaining it's features and to collect data from users.

Major learning outcomes: Significantly improved my skills in HTML, CSS, JS, Django framework, etc.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The company does not expect the interns to be experts, they gave me ample time to learn the required skills for a task before allotting it. Everyone I interacted with were quite friendly.

Academic courses relevant to the project: CS F111 for technical skills and CS F315 for social skills.

PS-II Station: Legato Health Technologies, Bengaluru

Faculty

Name: Chennupati Rakesh Prasanna

Student

Name: EESHA GADIA (2017B4A31571H)

Student write-up

PS-II project title: Java API development for WorkOs portal

Short summary of work done during PS-II: Acquired knowledge and implemented cloud technology and worked on developing the WorkOs portal. Gained an understanding of various technologies including postman, bitbucket, visual studio code etc.

Tool used (Development tools - H/w, S/w): Bitbucket, postman, vscode, java, eclipse, db mongo

Objectives of the project: Developing a portal based on cloud computing.

Major learning outcomes: Cloud computing, Java, API development.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: It was friendly and didn't put much pressure.

Academic courses relevant to the project: Opps, DSA.

PS-II Station: Lohum Cleantech Pvt. Ltd., - (Project 2), Greater Noida

Faculty

Name: Nithin Tom Mathew

Student

Name: VEDANT DESAI (2018A1PS0002G)

Student write-up

PS-II project title: Recovery of metals from spent Lithium Ion batteries

Short summary of work done during PS-II: The first task was to do a review on the research done in recycling the batteries. Followed by designing and conducting experiments at Lab Scale by varying the parameters for maximum possible Extraction. I used 3 different solvents for extraction of Manganese, Cobalt and Nickel using solvent extraction and recovery of lithium was using precipitation. The sequence of process followed was tried for the first time and is a potentially publishable content.

Tool used (Development tools - H/w, S/w): Common Lab Equipments, ICP-OES, Excel.

Objectives of the project: Recover the 4 metals (Lithium, Nickel, Manganese & Cobalt) present in spent / dead Li-Ion batteries.

Major learning outcomes: Research Oriented Project, Good Lab Working Environment experience, Core Chemical Engineering in the Renewable Sector.

Details of papers / patents: In Progress

Brief description of working environment, expectations from the company: It's a Startup, people will be busy and at the same time expect you to do your work. There is focus on innovation as it is an emerging industry. Mon-Sat Working.

Academic courses relevant to the project: Separation Process 1.

PS-II Station: Markets & Markets, Pune

Faculty

Name: RAMESH VENKATRAMAN

Student

Name: SOIKOT BANERJEE (2020H1410152P)

Student write-up

PS-II project title: Market research and business consulting

Short summary of work done during PS-II: I worked in market research. I prepared End to end reports on niche and high revenue markets for automotive and renewables industry under the automotive domain. Conducted primary and secondary research for accurate market estimation. Also worked on company profiles and made competitive landscapes.

Tool used (Development tools - H/w, S/w): MS-Excel, MS-Powerpoint.

Objectives of the project: To understand how to track upcoming trends in various Industries and to help clients to generate revenue from those trends.

Major learning outcomes: Primary and Secondary Research, Market Estimation, Market Sizing.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The environment of the company is very conducive for learning. It was work from home setup. The company expects us to be quick learner and learn how to adapt to rapidly changing technology.

Academic courses relevant to the project: MS-Excel.

Name: ATUL YADAV (2020H1490802P)

Student write-up

PS-II project title: Market research on NDIR

Short summary of work done during PS-II: Working on the projects related to semiconductors and electronics domain which involves company profiling of top 25 companies, market dynamics, patent analysis, revenue analysis, trade analysis, technological trends, Competitive landscape, Segmental chapters such as application, regional, application, components, type, and offerings, Conducting primary interviews, and Handling editor's comments.

Tool used (Development tools - H/w, S/w): Excel, PowerPoint, Word.

Objectives of the project: Study the market and provide market insights of ndir sensors through primary and secondary research.

Major learning outcomes: • Learnt how to do secondary market research by following government sources, conferences and other reliable publications to obtain correct market information.

• Learnt how to compose competitive landscape and business profiling, as well as marketing collaterals, and how to keep up with the newest industry trends and market overviews, which included drivers, constraints, opportunities, and challenges.

• Learnt a lot about cooperation, honesty, and accountability. Putting studied work into a finished report necessitates a great deal of responsibility and accountability, and working on this project report helped to instill such values.

- Learnt how to cope successfully with time constraint circumstances, work efficiently, and manage work effectively to meet deadlines and finish work on time every time a job was assigned.
- Learnt how to actively communicate with industry experts, CEOs, and Directors to gain vital insight into the business and markets.
- Learnt how to keep track of recent industry changes, including transactions, product launches, acquisitions, and other techniques used by significant competitors to achieve a significant competitive advantage.

Details of papers / patents: 1) Non dispersive infrared (NDIR) market

<https://www.marketsandmarkets.com/Market-Reports/non-dispersive-infrared-market-90187624.html>

2) Embedded security market

<https://www.marketsandmarkets.com/Market-Reports/embedded-security-market-63839062.html>

Brief description of working environment, expectations from the company: The company helped me to learn and implement my theoretical knowledge in real life scenario. The colleagues were very helpful and taught me how to conduct the process in proper order and cleared my doubts. During the permanent job I'm expecting to work on market estimations which I wasn't during the internship.

Academic courses relevant to the project: Marketing research, Consumer behaviour.

Name: ABHISHEK ROYCHOWDHURY (2020H1490831P)

Student write-up

PS-II project title: Feed preservatives market

Short summary of work done during PS-II: I could master writing the qualitative chapters of the report from various industries i happened to work in which required extensive research from both the secondary and primary sources. The entire PS duration was a great learning curve and gave

me a thorough outlook about the entire industry. Could not have asked for a better start for my professional career.

Tool used (Development tools - H/w, S/w): NA.

Objectives of the project: To describe and forecast the feed preservatives market in terms of type, livestock, feed type and region along with company profiling of all the key players operating in the industry, studying the complete value chain and analyse opportunities and strategy.

Major learning outcomes: Got complete knowledge of all the industry i happened to work in till date.

Inculcated professionalism, integrity and accountability.

Learnt how to effectively manage the time while simultaneously working in more than one projects and how to match client expectations.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment is good and very supportive. Be it meeting deadlines, getting better understanding of the client's requirements or getting feedback about any of my work that i did in my last 6 months, i have always found my team supportive which has been a real boon for me.

Academic courses relevant to the project: Yes, market research and consumer behaviour were particularly helpful.

Name: KARAN THUKRAL (2020H1490842P)

Student write-up

PS-II project title: Automotive transmission

Short summary of work done during PS-II: I was responsible for making syndicate reports, making company profiles, competitive landscape, doing market estimation on different segments.

Tool used (Development tools - H/w, S/w): Office and tableau.

Objectives of the project: Learnt about current and future transmission market demand.

Major learning outcomes: Learnt how to estimate market size for any market.

Details of papers / patents: Automotive transportation global forecast 2027.

Brief description of working environment, expectations from the company: Very helpful environment, expectation is more employee friendly company.

Academic courses relevant to the project: Marketing research.

PS-II Station: MathWorks India Pvt. Ltd., Bengaluru

Faculty

Name: Sonika Chandrakant Rathi

Student

Name: AASHITA DUTTA (2020H1030130H)

Student write-up

PS-II project title: Find and replace enhancements in MATLAB

Short summary of work done during PS-II: Trainings in MATLAB, Simulink, Coder products and resolving customer cases. Development of MATLAB Editor enhancement projects like- 1. Find with wrap-around feature- An option to wrap around the search so you can search the whole file from wherever the cursor is in the file. Without wrap-around, the search would go to the end of the file or the beginning (depending on the selected direction) but not search the whole file. 2. Keyboard shortcut actions- Implementing local keyboard shortcut actions such that when the Find strip is open, different keyboard shortcuts can toggle off/on features like Find Next, Find Previous, Replace, Replace All, Match Case, Whole Word, Regex, etc. 3. Find dialog with match case/whole word as pluggable(can be turned on/off)- The other applications that are consuming Find and Replace plugin don't want match case and whole word features to be always there in the Find strip. They must be given the flexibility to disable these optional features. 4. Find in Selection feature- To search for the text in a particular region, select the text and toggle the Find in selection button that will perform the search results in the selected section only.

Tool used (Development tools - H/w, S/w): MATLAB, Jira, Visual Studio Code, Perforce.

Objectives of the project: Find and Replacement enhancement is basically Find and Replace dialog redesign and enhancement. Along with highly improved find/replace related functionality.

Major learning outcomes: JavaScript and ECMA6 coding standards, HTML, CSS, MATLAB coding standards, Writing requirements analysis and functional design of the feature, Agile culture, Leadership and Communication skills, learnt about MATLAB, Simulink, Coder products etc.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Work culture is definitely very cool in MathWorks. EDG is the best part here where an individual can explore its potentials through trainings, knowledge sharing sessions, organizing meetings/events, sense of participation and helping each other, fun hours weekly, and most importantly flexibility to try out different projects until you find best fit for you as well as for team.

Work Culture is very amiable and supportive as the team members provide friendly assistance at the points where you stuck or not able to understand. Depending on the team you will get chance to become scrum master in the Daily stand up meetings.

Good exposure in team where you'll develop technical and communication skills. Good rapport maintenance with managers and timely feedback to help you improve areas where it needs improvement.

Academic courses relevant to the project: Software engineering, Algorithms and Data Structures.

PS-II Station: MBB Labs Pvt. Ltd., (Maybank), Bengaluru

Faculty

Name: Pravin Yashwant Pawar

Student

Name: MD ASHIF NAWAZ (2020H1490804P)

Student write-up

PS-II project title: Balance sheet maintenance - FPRA

Short summary of work done during PS-II: I have majorly participated in the enhancements of the application that comes as the requirements in the form of User stories in the subsequent sprints/releases. I took part in various direct works involved in the projection of financial statements for any specific set of companies / users. My work has ranged from gathering business requirements, documentation of the sprint requirements and enhancements achieved, reporting to the Product Owner to performing stress testing for the sprint enhancements.

Tool used (Development tools - H/w, S/w): SQL Developer Application, Selenium, MS-Word, MS-Powerpoint, Company in-house built tools.

Objectives of the project: Financial Projections and Ratio analysis involves evaluating the performance and financial health of a company by using data from the current and historical financial statements and projected financial statements.

Major learning outcomes: During my stint as a full time intern from 17th January 2022 to 24th June 2022 at MBB Labs Pvt. Ltd. (a wholly owned subsidiary of MAYBANK, Malaysia), I got the opportunity to get acquainted with the corporate processes of the Banking Offshore IT delivery centre.

Understanding the business requirements and coordinating with different project stakeholders. Software testing, Automation testing, Banking and Financial Services, Requirement Gathering, Documentation, Reporting.

Details of papers / patents:

<https://corporatefinanceinstitute.com/resources/knowledge/finance/financial-ratios/>

<https://zerodha.com/varsity/chapter/financial-ratio-analysis/>

References from Organisation's Internal Sources.

Brief description of working environment, expectations from the company: Very engaging and supportive working environment.

Academic courses relevant to the project: Product and Brand Management, Project Management, Business Analytics.

Name: RAVI SHANKAR PANDEY (2020H1490816P)

Student write-up

PS-II project title: Collateral management system

Short summary of work done during PS-II: Internship started with understanding the process of product release and the User stories for the upcoming sprints and major releases. Got the opportunity to work and get hands-on experience of Automation testing tools and understanding

the user stories especially for a FinTech Project. Major and direct contribution to the projects were Maintaining and updating Collateral management System Data Dictionary, updation of the Dropdown Codes and Data extraction and validation from DB. Largely occupied in the Sanity Testing & Regression Testing of the User interface and backend operations.

Tool used (Development tools - H/w, S/w): Ms Excel, SQL, Eclipse.

Objectives of the project: Testing the new collateral management application that would be replacing the legacy 'Group Collateral management system'.

Major learning outcomes: Overall understanding about the Collateral Management ecosystem in a Bank , key financial metrics used, Automation Testing & Project management skills.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Excellent and welcoming working environment with emphasis on teamwork and open dialogue. the mentor assigned to me was extremely friendly and helpful. The shift from academia to business is challenging yet fascinating. There is a stronger feeling of routine, and discipline is highly valued. The company expected us to meet our deadlines, and they were confident in our talents to learn what was required to complete our assignment.

Academic courses relevant to the project: Business Analytics, Fundamentals of Finance & Accounting; Financial Management.

PS-II Station: Media Tek - 1, Bengaluru

Faculty

Name: Swapna S Kulkarni

Student

Name: KALYAN SAHA (2020H1230153G)

Student write-up

PS-II project title: Synthesis of very low technology node for PPA requirement along with DFT insertion and perform Logic Equivalence Check (LEC)

Short summary of work done during PS-II: This project involved multiple stages to be performed in very low technology node in the MediaTek flow. The flow of synthesis which was physical aware actually consumed less area and is much less time taking than old flow. The DFT and LEC check were also important part of the project which actually decreases the chance of faults and can result in better outcome and lesser runtime for physical design steps.

Tool used (Development tools - H/w, S/w): Design compiler, Genus, Conformal tool, Innovus.

Objectives of the project: Synthesis refers to the step in the ASIC flow where the RTL code is modeled into Gate level netlist which is then used for DFT(Design For Testability) and Physical design respectively. At DFT stage test circuit pattern is inserted to check different types.

Major learning outcomes: Synthesis, DFT, ATPG, LEC.

Details of papers / patents: The paper is about synthesis of low technology very complex node.

Brief description of working environment, expectations from the company: The work culture is very good and friendly.

Academic courses relevant to the project: VLSI architecture, Cad for IC design, VLSI design.

Name: ALOK KUMAR (2020H1230176G)

Student write-up

PS-II project title: Pre-synthesis PPA analysis and RTL architecture improvement using RTLA tool

Short summary of work done during PS-II: With increasing design complexity and more time required during synthesis it is very important to reduce number of iterations during design period. Usually once developer hands off architecture to integration team for synthesis and PPA analysis. After analyzing PPA report feedback is given to designer to modify RTL architecture. This process usually takes 3-4 weeks time. Using RTLA, RTL architecture can be analyzed in the development phase itself and architecture can be improved based upon design constraints and performance requirements. In the current project, a display subsystem having 2-4 million instances and 4 nanometer processing technology has been analyzed using RTLA tool and pre synthesis PPA results has been used to improve RTL architecture further.

Tool used (Development tools - H/w, S/w): Synopsys RTLA, Fsuion Compiler, Design Compiler, Cadence Genus and Innovous.

Objectives of the project: Objective of this project is to analyze the RTL code using RTLA tool for improvement in terms of power, performance and area and to compare the result with existing tool performing same tasks.

Major learning outcomes: Learnt about different factors affecting key performance indexes of a nanometer device and different ways to achieve desired PPA targets.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Everyone around here is very helpful and let us explore as much as we want. Work environment is really nice and company provides flexible working hours.

Academic courses relevant to the project: Digital VLSI design, Advance VLSI design.

Name: PRATEEK REDDY B S (2020H1230185G)

Student write-up

PS-II project title: Synthesis and quality checks on a netlist

Short summary of work done during PS-II: A subsystem of a real-time project is given to perform Synthesis on the subsystem which converts Register-Transfer-Level (RTL) design to gate-level optimized netlist. The Synthesis flow includes Design For Testability (DFT) insertion to allow testing for faults in the logic present inside the subsystem. Once the optimized netlist is obtained from Synthesis, some of the quality checks like Logic Equivalence Check (LEC) in which RTL design and synthesized netlist are compared for logical equivalence in-terms of functionality and then Design Rule Check (DRC) should be performed in which DFT scan chain compatibility will be checked to perform Automatic Test Pattern Generation (ATPG) testing. After the Quality checks, ATPG flow is performed and the design should meet the target fault coverage.

Tool used (Development tools - H/w, S/w): Cadence Genus i-Spatial flow, Synopsys Design Compiler, Cadence Conformal tool and Synopsys TMAX.

Objectives of the project: To perform Synthesis of a given subsystem and perform quality checks on the netlist generated from synthesis.

Major learning outcomes: I have learnt environment setup for synthesis, Logic Equivalence Check (LEC), Design rule Check (DRC) and Automatic Test Pattern Generation (ATPG) flows. I have learnt various optimization strategies to achieve best possible Power, Performance, Area and Testability (PPAT).

Details of papers / patents: NA

Brief description of working environment, expectations from the company: MediaTek Bangalore has encouraging and supportive working environment which helped me in smooth transition from campus to corporate. They had conducted 5 days of Campus to Corporate sessions which gave me better understanding of the corporate culture. My manager and mentors

were friendly, supportive and guided me to execute the project and tasks. The regular feedback from my manager really helped me to be on the right track. All my colleagues were ready to help at all times be it online and offline interaction. Overall, I enjoyed the pleasant working culture at MediaTek Bangalore.

Academic courses relevant to the project: MEL G623 - Advanced VLSI Design.

Name: DIVYA R BAIJU (2020H1240083H)

Student write-up

PS-II project title: Development of a tool for efficient analysis of Performance logs in LTE network

Short summary of work done during PS-II: Studied 2G,3G and 4G system general architecture overview and specification study for LTE data plane (specifically Layer2 of the protocol stack). Understood logging mechanisms in company UE. Studied tools currently used for log analysis in MediaTek. Developed new tool GUI. Scripting for automation of log file conversion. Integrated existing tools to the new tool. Log and visual parser development. Tested, validated and presented working of the new tool to the analysis team.

Tool used (Development tools - H/w, S/w): In-house tools and python development libraries, Python.

Objectives of the project: To develop a tool that integrates commonly used in-house analysis tools under a single framework, automates file format conversions (for compatibility with various tools), simplifies the extraction of crucial analysis parameters (log parser implementation).

Major learning outcomes: Analysis tool development cycle, LTE Layer 2 work flow, Python scripting for automation.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The team members are welcoming and ready to clarify doubts if you reach out to them. Mentor guided very well and provided resourceful insights in the entire development and implementation cycle of the project. Manager, team lead and HR were approachable for clearing any doubts and made sure the interns had a good working environment.

Academic courses relevant to the project: Wireless Communication, Python.

Name: PANDHEY SAURABH ANIL (2020H1240107P)

Student write-up

PS-II project title: LTE downlink logs and issues analysis and functionality improvement of smart analysis tool

Short summary of work done during PS-II: Initially, the time was given to understand the LTE specifications so that base of LTE will be strong. Further, architecture study was done to understand the modules on which the team works. This gave an insight into how data flows in LTE downlink scenarios and what could be the sources of issues. Then issue analysis was done for the live issues so that application of conceptual knowledge takes place. The issue analysis strengthened the LTE conceptual part. Finally, work on smart analysis tool provided an opportunity to work on Python and enhance coding skills.

Tool used (Development tools - H/w, S/w): MediaTek related trace logging tool and trace plotting tool, smart analysis tool and Python.

Objectives of the project: 1. To analyze the logs related to signal quality issues and other issues related to control information in LTE downlink scenario. 2. To work on functional improvement of smart analysis tool to improve efficiency of log analysis.

Major learning outcomes: Understood issues happening in LTE downlink scenarios, parameters related to it and how to deal with it. The work on smart analysis tool gave an opportunity to enhance my Python skills.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment of company is very healthy for a beginner. The manager and mentor gives sufficient time and resources to you to understand and adapt to the work. Simultaneously they make sure that you have understood and capable of handling things related to work by conducting small discussions/doubt clearing sessions. The mentors and all team members make sure that your learning curve is always growing up. MediaTek also focuses on work-life balance by conducting some small activities and events so that you can enjoy the overall work culture.

Academic courses relevant to the project: Advanced digital communication, Mobile and personal communication.

Name: PUVVALA VISHNU VARDHAN (2020H1240110P)

Student write-up

PS-II project title: Optimization of processing time in Rx analysis using Mediatek tool

Short summary of work done during PS-II: Analyze the root cause of the bug and transfer or to fix the bug in RX team.

Tool used (Development tools - H/w, S/w): Log representation tool.

Objectives of the project: To Analyze the root cause of the bug and transfer or to fix the bug.

Major learning outcomes: Got to know about in depth information about Receiver architecture.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: It is good to work in MediaTek and expectations from the company are also good.

Academic courses relevant to the project: Mobile Personal Communication, Advanced Digital Communication and Digital Signal Processing.

Name: SHUBHAM SRIVASTAVA (2020H1400112G)

Student write-up

PS-II project title: Implementation of quality checks used in SoC integration flow

Short summary of work done during PS-II: Firstly it was a one month long training session in which we learned about the basic theory concepts of Physical Design and Integration. After that I started to work on individual checks in depth on big modules. First I worked on Synthesis using Cadence Genus. Then next, I worked on LEC check using Cadence Conformal. Third was Electrical Rule Check (ERC). Then on STA using Synopsys Primetime. At last, I implemented CLP flow. At last, I was tagged into a project of 22 nm node in which I was assigned to do Synthesis, LEC and ERC.

Tool used (Development tools - H/w, S/w): Shell Scripting, Tcl and Perl Scripting, EDA Tools From Synopsys and Cadence (Genus, Design Compiler, Primetime, Fusion Compiler, Conformal)

Objectives of the project: The main objective of the project was to get familiar with the ASIC Integration flow and Physical design Flow concepts and to be able to implement all the quality checks performed in the flow.

Major learning outcomes: Implementation of quality checks used in ASIC Integration flow.

Details of papers / patents: No papers and patents were required to be referred.

Brief description of working environment, expectations from the company: My team is very supportive. My manager and all members always gave me full liberty and flexibility to learn and grow. They are always up to help in basics of the doubt too. What my manager expect is that I should be proactive and always eager to learn.

Academic courses relevant to the project: Advanced VLSI Design (MEL G623).

Name: BIJAY KUMAR SHARMA (2020H1400120G)

Student write-up

PS-II project title: Verification of AHB slave decoder IP in both SV and UVM environment.
Study of MIPS I7200 processor and OCP protocol

Short summary of work done during PS-II: From the undergoing training for RTL verification, I have learnt about different verification environment like SV and UVM. After verifying the IP (AHB slave decoder) in both SV and UVM environment, also compared them. Verification in UVM has some advantage over SV implementation like scalability and reusability. In UVM there are various classes pre-defined which we can use make different agents. In the later part of training, I have learnt about processor basics and architecture in detail. Since I will be working on MIPS verification, so studied the MIPS I7200 processor datasheet and working. Also went through the OCP protocol which is used by the chip to communicate among cores and coherence manager. I studied various types of transactions in the OCP protocol.

Tool used (Development tools - H/w, S/w): S/W-Unix,perl scripting, System Verilog, Verilog, UVM.

Objectives of the project: To understand different verification environment and also learn processor basics as the team works on mips verification.

Major learning outcomes: Understood how to write test cases in different verification environment and also learn processor basics ,memory hierarchy and open core protocol.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is nice. Everyone is approachable and helping in nature. The training program is very well structured.

Academic courses relevant to the project: VLSI Architecture, Software for embedded system.

Name: CHOKKAKULA SATISH (2020H1400122G)

Student write-up

PS-II project title: SoC block level implementation in physical design

Short summary of work done during PS-II: Working on a block level chip on physical design part to perform various flow steps in a PD, and understanding and debugging of bad reports and fixing violations or errors and to achieve good performance results.

Tool used (Development tools - H/w, S/w): Cadence innovus, TCL, Unix.

Objectives of the project: Work on a block level pd work to achieve good area, power and timing utilisation according to MediaTek standards and tsmc fabrication rules.

Major learning outcomes: Physical design part includes (floorplaning, pin placements of a chip, placement of std cells, CTS, routing, congestion control, many other things related to pd part).

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working at MediaTek is an excellent experience, people here are so helpful when you stuck at a part they are ready to help make you go forward, learnt a lot as a part of my training.

Academic courses relevant to the project: VLSI design,advanced VLSI design.

Name: VIPUL SANTWANI (2020H1400130G)

Student write-up

PS-II project title: Advanced synthesis trials on a modem block

Short summary of work done during PS-II: I worked on a small macro with 0.6 million instace count. The objective was to improve the PPA by targtrting various timing and leakage libraries. This is an imperative task as various reports needs to be analysed to meet the target. Then the geenrated output netlist needs to go through the QC checks to check the quality of the netlist.

Tool used (Development tools - H/w, S/w): Cadence Genus and inhouse tools of MediaTek.

Objectives of the project: To improve PPA of the block.

Major learning outcomes: Learned the whole synthesis process in deep, how to set up the env to how to imporve PPA and how to do Quality checks off the generated netlist.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working Environment of MediaTek is good. Most of the employees are very helpful. Learning ennvirment is also good. People are willing to help and make you learn.

Academic courses relevant to the project: VLSI architecture, VLSI design, digital design.

PS-II Station: MediaTek Bangalore Pvt. Ltd., Bengaluru

Faculty

Name: Rekha A

Student

Name: ADHIKARI YASHWANTH SAI (2020H1230155G)

Student write-up

PS-II project title: Area and power consumption reduction in smartphone display subsystem

Short summary of work done during PS-II: We'd worked on improving the Power and Area of the given Display subsystem by using techniques such as MBFF, ICG insertion and RTFF (Retention Flipflops).

Tool used (Development tools - H/w, S/w): Cadence Genus, Innovus.

Objectives of the project: To achieve improved area and power consumption by the subsystem.

Major learning outcomes: Techniques to achieve the required PPA viz. MBFF, ICG, RTFF.

Details of papers / patents: Papers on MBFF and ICG by S. Gautam & Cherie.

Brief description of working environment, expectations from the company: The work environment was good, mostly we'd worked on the CDE, Linux commands to perform the Synthesis, DFT steps. On a comparative note, synthesis work in other companies is restricted to sole synthesis whereas at MediaTek we get to work on synthesis as well as DFT steps.

Academic courses relevant to the project: VLSI Design, Adv VLSI Design.

Name: RAVI KUMAR JHA (2020H1230156G)

Student write-up

PS-II project title: Design and verification of AXI datapath width compressor IP and AXI-APB bridge IP

Short summary of work done during PS-II: This project consists the verification of the system on chip interconnects. Correct routing of transactions and intermediate bus IPs. The main objective is to verify the AXI Data Path Converter IP using company proprietary UVM TB methodology by substituting various test case in order to improve the pass rate and quality of verification. Verification IP is used to verify DUV or DUT faster, more thoroughly and with minute efforts. Verification Intellectual property (VIP) improves quality of verification and uses support various standard interfaces. Universal Verification methodology (UVM) has been used for modelling the master slave VIP. Verification plan process mainly focus on DUT features, TB architecture, and functional coverage model and test scenarios.

Tool used (Development tools - H/w, S/w): UVM Methodology, GVIM, LINUX.

Objectives of the project: The main objective is to verify the AXI Data Path Width Converter bus IP using company proprietary framework by including various test cases to enhance the throughput and quality of verification.

Major learning outcomes: Understood the working of AMBA bus protocols and how to use UVM methodology to build the verification environment in order to verify a design.

Details of papers / patents: Design & Verification of AXI Datapath Width Compressor IP and AXI-APB Bridge IP.

Brief description of working environment, expectations from the company: Verification of AXI Data Path Width Converter Bus IP is done before embedding into the system on chip. Verified the functionality of 64 bits to 32 bits, 128 bits to 64 bits, and 256 bits to 128 bits are done. Analysed waveform for different test cases. Find out errors in designs and debugged it and achieved 100% pass rate. To check whether it meets the functionality, functional coverage also done and it is 100%.

Academic courses relevant to the project: Advanced VLSI design, Reconfigurable computing.

Name: NIKHIL RAVINDRA PRABHU (2020H1230160G)

Student write-up

PS-II project title: Study of synthesizing Netlist and understanding STA of a specific block

Short summary of work done during PS-II: In the project, the major learning was to understand the steps involved in synthesis that includes the understanding of libraries involved in the design, how the tools settings affect the area, speed and power performance of the circuit, basic DFT flow and how the netlist is converted into a testable netlist by the tools and brief understanding about various timing constraints and how the netlist is analyzed for various modes and corners.

Tool used (Development tools - H/w, S/w): Design Compiler, Genus.

Objectives of the project: To learn about how the gate-level netlist is generated from RTL and understanding various aspects of timings.

Major learning outcomes: Understanding of synthesis and STA Flow and DFT is incorporated in synthesis.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment is quite good especially with the hybrid mode, it was easier to interact with the seniors and higher ups and due to sync up meets kept by the teams it was easier to get involved in the team and the learning due to that was quite high.

Academic courses relevant to the project: VLSI Design, Advance VLSI Design, Reconfigurable Computing.

Name: SHIVAM SINGH (2020H1230229P)

Student write-up

PS-II project title: Study of synthesizing Netlist and performing Flat-Top STA of a specific TOP

Short summary of work done during PS-II: I have done full synthesis of a design for a given macro and performed Lec checks on it. I had compared RTL with sdc if there is mismatch it will give huge timing violations. Cadence genus was really helpful for doing synthesis. In last I had done flat top sta of a top block. I had set the environment and studied the complete flow of the company and then generated timing reports to compare top and block level timings so PD team can find degree of correlations in it and try to optimize it.

Tool used (Development tools - H/w, S/w): Cadence Genus, Cadence Conformal, Synopsis Primetime.

Objectives of the project: To do synthesis and dft on a given macro and flat top sta of bigger top.

Major learning outcomes: STA basics, LEC,DFT of design, cadence genus hands on, TCL, synopsis Primetime, Flat top sta, atpg insertion, power performance area optimization, Full backend flow.

Details of papers / patents: I haven't done any paper/patent in company

Brief description of working environment, expectations from the company: Working environment is really great in MediaTek. They had first given us theoretical training then live training on dummy designs and when we became proficient then only we was put in live projects. I want to have this same working culture and respect for each other in next coming years and can contribute to better development of company.

Academic courses relevant to the project: Cad for IC design, VLSI test and testability.

Name: SHIVANGI SHUKLA (2020H1230315H)

Student write-up

PS-II project title: Implementation of a Complex Block in WiFi 7 SoC

Short summary of work done during PS-II: Initially one month, various training sessions were conducted, where the first week was HR training, where we were given general guidelines about work culture. From second week onwards, we had common trainings, which gave us an insight into ASIC Design flow, how mediatek follows the design flow. Also, lab sessions were held, to give us an overview as to how to work in the environment. From forth week, PD specific trainings were held. In february, project was allotted. Cadence Innovus training was held to give us thorough knowledge so as to how to use the tool. My mentor provided PD related materials to study and understand the basics, which helped me during my project. I ran all the stages of PD to the block, solved the errors, and now the block is ready for tapeout.

Tool used (Development tools - H/w, S/w): Cadence Innovus.

Objectives of the project: To implement a block of Wifi 7, to go through all the steps of physical design before the block is ready for tapeout.

Major learning outcomes: Learnt the backend of ASIC design flow, how a block is prepared before preparing mask.

Details of papers / patents: MediaTek internal trainings and websites.

Brief description of working environment, expectations from the company: The working environment is very friendly and encouraging. Even though it's my first job, the introduction to the work environment has been smooth, thanks to my colleagues and seniors, which made my journey very easy and comfortable. It's very convenient to approach any senior, incase of any doubt. We had team outing which helped to create bonds between different teams.

Academic courses relevant to the project: VLSI Design.

Name: RAHUL SINGH SOUN (2020H1230326H)

Student write-up

PS-II project title: Design verification of PCIe IPM

Short summary of work done during PS-II: During PS at first SV / UVM training was provided after that I was assigned to PCIe protocol design verification. In the project I understood the protocol and helped team to make changes and modification in the testbench also helped in debugging issues related to PCIe.

Tool used (Development tools - H/w, S/w): Gvim ,Verdi.

Objectives of the project: Understand PCIe protocol and implement testbench architecture for PCIe 5.0.

Major learning outcomes: Understood various Protocols,Testbench Architecture and finally implemented some changes in Testbench.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Mediatek is a workplace that promotes employee growth, safety, and goal attainment. These environments are most conducive to a successful workforce as they encourage employees to perform to their highest ability. Manager always support employee growth and making employee feel comfortable. Overall best working environment

Academic courses relevant to the project: Computer Architecture.

Name: VAGGU SRIKANTH (2020H1230331H)

Student write-up

PS-II project title: Study of synthesis, PPA (Power, Performance & Area) optimization and Quality-Checks for 5G-Modem in Smartphones by using EDA tools

Short summary of work done during PS-II: The project requirement was to achieve the best Power, Performance and Area specifications within a specified timeline by making use of various EDA Tools like Cadence Genus and Synopsys Design Compiler. the main task at hand was to achieve at-least 10-15% improvement of critical design parameters compared to earlier projects results. so, we tried to make use of various combinations of EDA Tools and include some new tactics in design flow by tweaking values of various variables which could impact the performance metrics significantly and help us in achieving the target. Many combination of trials with various variable value tweaking have been performed , some of trials gave us some nice results which have been overlooked in earlier projects and that data has been consolidated and kept ready to propose during the time of next project which could considerably improve design metrics as well as reducing the tool run time to give us final netlist quickly.

Tool used (Development tools - H/w, S/w): Cadence Genus, Synopsys Design Compiler, Cadence Innovus, Synopsys ICC2.

Objectives of the project: 1) To understand the full flow of Synthesis process and Various Quality-Checks Process. 2) To understand how are we making use of Advanced EDA Tools to implement the design across various technology nodes. 3) To understand the various techniques that can be used in the process.

Major learning outcomes: 1) Got insights into various Tool flows that are being used by the industry at various levels of VLSI Design Flow.

2) Got to Understand the full flow of Synthesis process.

3) Got to Understand the various techniques that can be used to achieve the required Power , Performance and Area Metrics for our design.

4) Got to Understand the various types of Quality-Checks that will be done on the design at various levels of design flow to ensure error free and logical correctness of the design before tape-out.

5) Got to Understand the way a project takes off and what are the various activities involved in delivering a project successfully by consistently meeting the deadlines.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: • In the various stages of design process its not only about to always follow the existing flow of the tool, that is available and try to achieve the desired target specifications for our design. But also, whenever a challenge comes up, it's always necessary to come up with some innovation that might resolve the challenges and help us in meeting the goals.

- We also have to work very closely with the EDA tools vendors for the betterment of the tool flow which will aid us in reducing the run times of the various runs that we do at various levels of design flow.

- In this competitive field of industry, in near future we can try to make use of AI integrated tools that will enable us to provide better and faster results and also helping the company to stay ahead in the market.

Academic courses relevant to the project: Yes courses like VLSI design, PMMD, CAD for IC design, IC fabrication, Advanced VLSI design were very useful.

Name: GANGAVARAPU ANUHYA (2020H1230332H)

Student write-up

PS-II project title: Synthesis and Static Timing Analysis of Internet Service Provider

Short summary of work done during PS-II: According to Moore's law, the number of transistors incorporated in an IC doubles every year so in order to get optimized area and power and increase the performance, we should need the best EDA Tools. Physical Aware synthesis is done using the Cadence Genus tool. This makes sure that the resultant design obtained is closer to the final requirement. LEC is done using Conformal and it makes sure the correctness of the functionality and ATPG is done using the Tetramax tool, making sure that a small set of vectors is generated at a low computational cost.

Tool used (Development tools - H/w, S/w): Innovus, conformal, Tetramax Scripting Languages: Linux Tools used: Cadence - Innovus, Design Compiler. Synopsys- IC Compiler-II.

Objectives of the project: In the semiconductor industry, there is a full ASIC Flow to prepare a design as per the demands. It is divided into two parts Frontend and Backend. The frontend team Provides the RTL whereas the backend team generates the netlist and goes through various verification process.

Major learning outcomes: The major learning outcomes are mainly about synthesis. Had understood the basics of synthesis and STA. The understanding of ATPG, LEC and DFT.

Details of papers / patents: There are no papers published by me as of now.

Brief description of working environment, expectations from the company: The company is expecting the employee to have good basic understanding of the process flow. The mentors and managers are very helpful. The training that the company provided initially is very helpful to get to know about the subject. The teammates and colleagues are also very helpful in clearing doubts in the subject.

Academic courses relevant to the project: Yes, some of the academic courses were relevant to the project like VLSI design, Cad for IC design, PMMD, Advance VLSI design, Design for test and testability.

Name: SHOIAB NAAFI (2020H1240085H)

Student write-up

PS-II project title: Packet switched context logging enhancement for smartphone modem

Short summary of work done during PS-II: In this project, a literature survey of various cellular wireless technology was done, including 2G, 3G and 4G. The literature survey included topics like GPRS Services, GMM, PDP Context Management, GTP Layer for the Control Plane etc., for 2G, UMTS - Radio Access Network, UMTS - GPRS Tunneling Protocol, UMTS - Proxy Mobile IPv6 Protocol, UMTS architecture, PDP Context Management, for 3G. LTE Network Architecture, Roaming Architecture, LTE Protocol Stack Layers, LTE Layers Data Flow, LTE Call Flow, and EPS Session Management for 4G was done. In this project, a function was developed to transfer the parameters of different PDP and PDN procedures from one module to another. The messages sent from one module to the other will consist of parameters of 2G and 3G Context Activation processes like PDP Context Activation Procedure, PDP Context Deactivation Procedure, PDP Context Modification Procedure, and Secondary PDP Context Activation Procedure. For 4G processes Authentication procedure, Default EPS bearer context activation procedure, Dedicated EPS bearer context activation procedure, EPS bearer context modification procedure. The displayed parameter will be shown in MediaTek's proprietary logging tool, which will help debug issues.

Tool used (Development tools - H/w, S/w): Microsoft Visual Studio, Perforce p4v, MediaTek's logging tool, Source Insight.

Objectives of the project: A function was developed to transfer the parameters of different PDP(Packet data Protocol) and PDN (Public Data Network) procedures from one module to another for 2G, 3G and 4G.

Major learning outcomes: Major learning outcomes were:

1. Learnt about Network Architecture of 2G,3G and 4G 2. Learnt about session management procedures in detail 3. Use of various industry-level tools 4. Learnt about Modem Architecture and design 5. Development of modules for different modules.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was excellent. Both my seniors and other interns were supportive and ready to help. Whenever I got stuck during my studies or coding, people used to come forward and help me out. The office was spacious, and the working computer and other devices were good. The working hours were flexible, and we could choose our own time to work in. The team promote collaboration and teamwork and emphasize positive feedback. Seniors also provide constructive feedback to encourage interns to improve.

Academic courses relevant to the project: Advanced Digital Communication, Mobile and Personal Communication.

Name: AMRITH AATHMARAM (2020H1240104P)

Student write-up

PS-II project title: Study of LTE Channel Decoder System

Short summary of work done during PS-II: Studied the various concepts involved in the decoding of the control and data channels. Studied proprietary algorithms and tools that are used in the development as well as testing of the end product. Contributed to critical issue analysis and fixing bugs in the firmware.

Tool used (Development tools - H/w, S/w): C

Objectives of the project: The main objective is to study and understand the channel decoder system, to debug and develop on the firmware that carries out the decoding of the physical channels in an efficient way.

Major learning outcomes: Understood the 4G LTE channel decoder system as well as various procedures and protocols involved in LTE based communication.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The overall environment is very encouraging to learn new things and explore on your own. The projects/tasks assigned are exciting as new learning is involved in every stage. The company expects the employee to have some basic commitment towards the work/tasks assigned and expects to meet the deadlines.

Academic courses relevant to the project: EEEG641.

Name: YASH GANESH KOTHAWADE (2020H1400101G)

Student write-up

PS-II project title: Synthesis and PPA Optimization of Modem Block

Short summary of work done during PS-II: For the first month, various rigorous trainings were organized. One month long advanced synthesis workshop was carried out in February. Later one project block was assigned to each one of us and were asked to do shadow runs. One mentor was assigned to each one of us for these shadow runs. He guided us through the entire synthesis flow step by step. File handling and resolution were the main challenges in the shadow runs.

Tool used (Development tools - H/w, S/w): Cadence Genus, CDE Flow (internal to mediatek), Linux file handling.

Objectives of the project: To synthesize a modem block successfully and optimize its Power, Performance and Area requirements.

Major Learning Outcomes: ASIC Design Flow, Synthesis Process, PPA Optimization Techniques, Various Tools usage, Linux.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was really good. The team and the manager were highly supportive. Work culture at mediatek is superb and employee friendly.

Academic courses relevant to the project: VLSI design.

Name: TALARI KARUN KUMAR (2020H1400110G)

Student write-up

PS-II project title: Study and Implementation of AHB Frequency Bridge Verification Environment using SV and UVM and Study of MIPS I7200 and Open Core Protocol (3.0)

Short summary of work done during PS-II: I joined CPU Verification Team at Bangalore which is responsible for the Verification of MIPS IP with the Constant Interaction With the Design team. Since I am new to RTL verification, Initially, weeks I was trained on System Verilog and UVM which included Lab sessions as well. Later On, I was asked to Study AHB Protocol and AHB Frequency Bridge (Company Specific IP). After the IP Understanding, I was asked to Implement a Verification environment for a test case for the AHB Frequency Bridge (DUT) Using SV (System Verilog). After That, I was asked to compare my SV test Environment With the Existing UVM Environment (Which was already implemented by the team previously). Then I was asked to give a presentation on my IP Understanding to the entire team. I was given feedback on my understanding. This took almost 3 months of the internship, I had a weekly target and I had to give the status of my work every week to the manager. As I already said the team works for CPU

Verification, hence I was given 3 weeks' time to understand the Basics of MIPS Processor and MIPS I7200 from Open Source Documents. Then I had to give a presentation to the entire team on MIPS I7200 Architecture. The MIPS Multiple Processing has one Component, CM (Coherence Manager) which is responsible for cache Coherence. MIPS Core Interacts with CM only with OCP Protocol and hence I was asked to Understand OCP Protocol as well.

Tool used (Development tools - H/w, S/w): S/w - Synopsys VCS to Simulate the Verification Environment.

Objectives of the project: Understand IP and Create System Verilog Verification environment for a test case and understand MIPS architecture for CPU verification.

Major learning outcomes: 1) Languages - System Verilog , UVM (Methodology)
2) Protocols - AHB and Open Core Protocol (3.0)
3) Architecture - MIPS I7200
4) Implementation of Verification Environment for AHB Frequency Bridge for Single Non Sequential Write Testcase.
5) Understanding of simulated waveforms on Verdi (Synopsys VCS Tool) and UNIX Commands.
6) Interpersonal and Soft Skills through Regular Discussions with Team Members and periodic presentations given to team during complete internship period.

Details of papers / patents: No papers Published, since VLSI -Verification Domain was new to me, most of the time of the Internship was spent for building fundamentals of the domain through company specification Docs and Open source materials.

Brief description of working environment, expectations from the company: The working environment is good. On day 1 itself, I was assigned a buddy (Mentor) in the team, who actually supported me throughout the Internship period. He was the first point of contact for all my queries which included both technical as well non-tech too. I was given the opportunity to present my understanding to the team, after every presentation I was given feedback which I felt very essential to any newbie in the field. Completed Internship was well planned by the team through the scheduled timetable that was given to me every month and deadlines were flexible though. During the Internship, there was a team lunch as well which helped to understand the team members better. Coming to expectations from a fresher is like he/she must be strong fundamental

of the domain, should be curious to learn new things both from fellow team members or across teams as well. The candidate should also demonstrate an interest in the field through technical discussions during the presentation. Overall, the team was very friendly and approachable and has given me very good experience that would help in the professional phase as well.

Academic courses relevant to the project: Embedded Systems, Reconfigurable Computing, VLSI Design.

Name: MUMMADIREDDY REDDIVARI BHANU SASHANK REDDY (2020H1400121G)

Student write-up

PS-II project title: Synthesis of Complex Modules for meeting PPA targets along with DFT Insertion, LEC & ATPG

Short summary of work done during PS-II: I had been first put into a training course where they gave me insight of all the basics of front-end, integration & back-end. Then I was given training on Synthesis (integration) specific training program which made me understand the environment well and get acquainted with the synthesis related control variables. Then I was assigned a specific block on which I have to perform this Synthesis Flow to ensure its PPA parameters (netlist quality) are as expected. Then after we met the PPA expectations of the block then we went to perform Logic Equivalence using Cadence Conformal LEC tool. Then we went onto give the DRC & ATPG runs.

Tool used (Development tools - H/w, S/w): Cadence Genus, Cadence Conformal.

Objectives of the project: 1. To experience the Physical Synthesis Flow Flush. 2. To check the Logic Equivalence b/w the RTL design and the output netlist. 3. To perform ATPG runs for the given block.

Major learning outcomes: Analyzed the quality of netlist generated out of Synthesis. Understood the synthesis flow.

Details of papers / patents: Since we are doing synthesis' shadow runs, we had no scope of going into papers / patents.

Brief description of working environment, expectations from the company: The company is expecting a lot of deep knowledge on what you are working on. You have to learn detailed things related to whatever project you are working on. They will ask you to present on the project periodically and they will throw some criss-cross questions to you on that topic to test your knowledge in the project. Be clear and be assured you're getting what you're doing.

Academic courses relevant to the project: MEL G623 (Advanced VLSI Design).

Name: ANIMES DASH (2020H1400125G)

Student write-up

PS-II project title: Synthesis of very complex modules for meeting high PPA targets in lower technology nodes

Short summary of work done during PS-II: Basically my work was more on Synthesis, Improving PPA to meet the requirements and learning STA.

Tool used (Development tools - H/w, S/w): H/w - Cadence Genus, Synopsis Design Compiler, Prime Time, Timing ECO tool, Tempus by Cadence.

Objectives of the project: To map the design into a technological library in order to fit speed, power & area constraints. Optimize the design before placement in order to fit speed & area constraints and making it a good starting point before the place & route step.

Major learning outcomes: • Compile time grows significantly with the circuit size in case of synthesis. PPA Improvement is a major part of good synthesis practice.

• Rather than guaranteeing the best possible circuit, today's synthesis algorithm attempts to meet designer's specified goals.

- The quality of synthesis result depends on how good is the RTL de- scription of the design and constraints defined.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The Working Environment is really awesome. You'll be working on live projects after a basic training and also will be using industry standard cutting edge tools. You will get to learn a lot from all the senior staffs. Seniors are really helpful in evry possible way. After finishing your work or in between your work you can roam around and play different indoor games to recharge yourself.

Academic courses relevant to the project: VLSI Design, Advance VLSI Design, Digital Electronics.

Name: SHUBHAM SHUKLA (2020H1400128G)

Student write-up

PS-II project title: Real Time Soc implementation using APR flow

Short summary of work done during PS-II: I have completed the APR flow right from the floorplan to routing. I also worked with lot of scripting languages like TCL. There are some debugging techniques that i have learned along the process. Also how to meet timing for different paths in a design.

Tool used (Development tools - H/w, S/w): Innovus from Cadence.

Objectives of the project: Complete APR flow.

Major learning outcomes: 1. Scripting language TCL 2. Innovus commands 3. APR flow 4. Debugging techniques.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The environment here is super awesome. Everyone is really helpful. If you have any doubt you can reach out to anyone in your team or to other team as well. So everyone is friendly and helpful which makes it a nice environment to work in.

Academic courses relevant to the project: VLSI design and Advanced vlsi design.

Name: ABHISHEK KUMAR GAURAV (2020H1400185P)

Student write-up

PS-II project title: Memory Built-In Self Test (MBIST)

Short summary of work done during PS-II: It was a great learning experience. What I have studied during the course of my M.E, I got to understand those things practically. It was a great industrial exposure and I believe its a great initiative of practice school provided by BITS. I got to learn the industrial manners before even completing the college which is a great advantage.

Tool used (Development tools - H/w, S/w): Tessent tool.

Objectives of the project: Testing of embedded memories on soc using mbist dft technique.

Major Learning Outcomes: MBIST architecture and its hardware, MBIST Tessent Tool Flow, Verilog HDL and PERL.

Details of papers / patents: My paper / report is based on various IEEE papers which I have taken use to understand the concepts of MBIST.

Brief description of working environment, expectations from the company: MediaTek is great company to work with. Its has a very well designed training program which helped us when

we were given different works in the live project. Right from Manager to the whole team, they are all very helpful. It has great working culture where doubts and discussions are always encouraged by each and everyone.

Academic courses relevant to the project: YES. There is a subject which is taught to us in the 3rd semester i.e. DFT which was very helpful.

Name: MALI SAINADH (2020H1400219H)

Student write-up

PS-II project title: Physical design implementation of a complex block in WiFi SOC

Short summary of work done during PS-II: Initially, we were given training on all the stages of Physical Design. Then we were given a real time block on which we have to implement all the stages of Physical Design starting from floorplan to sign-off. During this process, we also cleared all the DRC's, LVS, ERC violations.

Tool used (Development tools - H/w, S/w): Cadence Innovus.

Objectives of the project: To implement all the stages of physical design.

Major learning outcomes: I have gained hands on experience in all the stages of physical design using Cadence Innovus tool.

Details of papers / patents: No papers or patents.

Brief description of working environment, expectations from the company: Work environment is very good. Every one in the company are so friendly and professional. We can reach out to anyone for any doubts or clarifications irrespective of their experience and position. Everyone are ready to learn from others.

Academic courses relevant to the project: VLSI physical design by Prof. Indranil Sen Gupta.

Name: DIBYOJYOTI KUNDU (2020H1400226H)

Student write-up

PS-II project title: Block level Physical Design Implementation

Short summary of work done during PS-II: Implement all the physical design stages starting from floorplanning to sign off. Also worked on an automation related work which is related to connecting power and ground wires with the PADS, which will reduce man efforts and timing.

Tool used (Development tools - H/w, S/w): H/W - Cadence Innovus, Calibre.

Objectives of the project: To understand the flow of physical design and get accustomed to Innovus tool and commands.

Major learning outcomes: Understood the flow of all the stages, and get to know how to fix different DRC issues.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work Environment is good. Lots of learning scope is there. Seniors are always there to help and everyone is very much knowledgeable. Work pressure is little high here but if anyone takes it as an opportunity to grow knowledge and skills, he/she can learn so many things.

Academic courses relevant to the project: CAD for VLSI design, concepts of static timing analysis are relevant to the project.

Name: MAITHILI PHATAK (2020H1400240H)

Student write-up

PS-II project title: Carepath STA Signoff

Short summary of work done during PS-II: I performed carepath STA for a project. To do that first I ran a carepath STA run using cfg files and then using the reports generated found out the various violating paths. Carepath STA constraint violations can be of four types – Latency, Skew, Interval and Transition. Wrote a script to optimize the carepath run time by finding out the related and totally unrelated cfgs and then doing carepath run and Tweaker fixing on them separately. Tweaker is an ECO tool which was used to perform the carepath constraint violation fixing. The violating carepath constraints can be fixed by any one of the following methods - Vt swapping, sizing or buffer insertion.

Tool used (Development tools - H/w, S/w): PrimeTime and Tweaker.

Objectives of the project: The main objective of this project is to perform Carepath STA on a design and then fix the violating paths using Tweaker tool.

Major learning outcomes: Understood the Static timing analysis flow and carepath STA flow. Learnt how to do timing ECO (engineering change order) and how to fix setup and hold violations. Performed carepath STA of a project and understood how it is different from normal STA and then fixed various carepath violations using Tweaker tool.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment at mediatek is very good. The initial training helped me a lot and we learnt how to use the new tools and softwares. I was given a project early on and it helped me a lot in understanding the new concepts and I did a lot of hands - on work which helped me to learn how to apply those concepts on an actual project.

Academic courses relevant to the project: VLSI design and Advanced VLSI design.

Name: TETALA SUNIL REDDY (2020H1400245H)

Student write-up

PS-II project title: Implementation of a complex block on Wi-Fi 7 SoC

Short summary of work done during PS-II: Successfully implemented the complex block which passed all the quality and sanity checks and also it had improvement in utilization factor.

Tool used (Development tools - H/w, S/w): Innovus, Spyder3.0.

Objectives of the project: Understanding the MediaTek physical design flow and the tools used in it.

Major learning outcomes: Learnt about the Innovus tool, handling of tcl files, some basic linux commands and learnt python scripting.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work culture in MediaTek is very good. It is not hectic. Learning curve is very high.

Academic courses relevant to the project: No, It would be better if they could provide some laboratory course on Cadence Innovus tool for embedded and microelectronics students.

PS-II Station: Medplus, Pan India

Faculty

Name: Bharathi R

Student

Name: SHUBHAM CHAPPARGHARE (2020H1060266H)

Student write-up

PS-II project title: Design and Implementation of Delta Robot with Image Processing

Short summary of work done during PS-II: Involved in existing projects, and trying to provide an additional input to senior design team. 1. Involved in designing delta robot parts, bearings and ball joint selections. 2. Getting out of the box and getting in touch with vendors to get those parts manufactured properly and taking some valuable inputs from them as per design for manufacturing (DFM) and design for assembly (DFA) is concerned. 3. Getting in touch with procurement team to order the selected components required for accomplishment of the project. 4. Getting involved with project discussion with entire R & amp; department and HOD. And suggesting inputs to them.

Tool used (Development tools - H/w, S/w): H/w- Laser Cutting Machine, 3D Printer S/w:- Solidworks, Creo Parametric, Autocad.

Objectives of the project: This project will help organization to get step into the artificial intelligence environment. This pick and place robot, with the help of camera will capture the incoming medicine strips on the conveyor.

Major learning outcomes: 1. Delta robot project will help in segregation process and will be helpful for existing barcode applicator.
2. Company can also think to commercialize this robot and can sell these in open market.
3. Also, the system of product recognition and object following can be a boon to the automation unit for existing and future projects.
4. On a broader scale the project will solve most of the issues and will increase the efficiency of the of the country's 2 nd largest medicines supply chain.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: 1) There is lot more scope for a research consultation with this organization but as of now the organization has decided to do only in house projects.

2) Complete R & D and other developments are confidential as per the company policy.

Academic courses relevant to the project: Robotics and Mechanism, Quality Control, Theory of Machines, Mechatronics.

PS-II Station: Mercedes Benz, Bengaluru

Faculty

Name: Shashank Mohan Tiwari

Student

Name: MIHIR NITIN PINGALE (2018A4PS0514G)

Student write-up

PS-II project title: Developing a tool to determine EDU (Electric Drive Unit) parameters for EVs (Electric Vehicles)

Short summary of work done during PS-II: The tool was prepared using VBA programming in MS Excel. To decide the flow of operations in the tool and the formulae to be used, we (me, my Mentor, and Technical specialist) held meetings thrice a week, apart from the calls I made them to understand something or clear some doubt. The decisions were made based on user convenience, accuracy of output and the way in which I could program the feature into the tool. I

gave presentations on overview of the tool progress to my manager and other experienced colleagues at various stages of the tool completion and collected the feedback. During our meetings we discussed the feedback, suggestions, and advice received and then made changes in the tool accordingly.

Tool used (Development tools - H/w, S/w): MS Excel (with VBA), MS Word, MS PowerPoint.

Objectives of the project: The objective of this project was to develop a tool in MS Excel using Visual Basic for Applications (VBA) Programming language. The tool serves as a general purpose calculation sheet that shall help users determine some critical parameters related to EDUs,

Major learning outcomes: I learnt the VBA programming language for making this tool in MS Excel, and in the process learnt many new features in MS Excel. I gave presentations to different teams to get their feedback- through these I learnt soft skills like presentation skills, interactive skills, etc. I came to know about the mathematics and physics behind the movement of the car, and especially learnt about the formulae related to transmission systems in EVs and also cars in general. I got to know about Drivetrain systems in EVs, Electric motors, etc.

Details of papers / patents: None

Brief description of working environment, expectations from the company: It was a WFH (Online) PS. All the people I met were very helpful and understanding. You will get to learn a lot.

Academic courses relevant to the project: None.

Name: KULKARNI SUMEDH SHIRISH (2018A4PS0582P)

Student write-up

PS-II project title: Exploring AI for Generative Design

Short summary of work done during PS-II: At MBRDI, my first task was to conduct a literature survey to gain knowledge about the subject matter. After gaining the necessary information about artificial intelligence, generative design and topology optimization, I was asked to put forward a proof of concept. As per the design problem given to me by my mentors, I proposed a generative design procedure based on generative adversarial networks that would be capable of generating designs that conform to the given design constraints.

Tool used (Development tools - H/w, S/w): Python.

Objectives of the project: Understanding and integrating artificial intelligence with generative design.

Major learning outcomes: Knowledge of artificial intelligence and generative design, along with the means to implement both to make a generative design model on python and related libraries.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Mentors were very supportive and their guidance motivated me to excel in the project.

Academic courses relevant to the project: Machine Drawing and Design, CAD, Computer Programming.

Name: ROHAN MALIK (2018A4PS0780P)

Student write-up

PS-II project title: Application of Machine Learning in Vehicle Crash Simulations

Short summary of work done during PS-II: A systematic literature review was performed to understand the recent trends in industry regarding application of Machine Learning and to identify research gaps that can be worked on in the future by Crashworthiness experts. Concepts

regarding crashworthiness such as parts of Body in White, Thin Walled Structures, Crashworthiness Criteria were studied in detail. After shortlisting all papers relevant to the field, 80+ papers were studied in detail to understand the objective, rationale, algorithm & data used, results and limitations. Machine Learning algorithms from the research papers read were replicated using the data given, and the results obtained have been compared to the results published in the available literature. The models prepared included Neural Networks, Decision Trees, Convolutional NN and Genetic Algorithm.

Tool used (Development tools - H/w, S/w): Python, Scikit Learn, Keras, nltk, Jupyter.

Objectives of the project: The main focus of the project is to understand the how Artificial Intelligence / Machine Learning techniques can be applied to CAE Crash Simulations.

Major learning outcomes: Reading Research papers, Writing a Systematic Literature Review Paper, Machine Learning, Vehicle Crash Simulations, Application of ML to CAE simulations, Python, Communication Skills, Teamwork.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The entire PS-2 project was conducted remotely. My manager was very pro-active in getting the work done from the team and we used to have weekly meets. All the team members were very supportive and helped me in understanding different concepts and simulation software. The work environment is very friendly and the tasks were completed by the team in a very structured way. I was given the opportunity to try out different CAE simulation software and was provided with great learning experience.

Academic courses relevant to the project: Machine Learning, Artificial Intelligence, Mechanics of Solids.

Name: K BADARI VISHAL (2018A4PS0807G)

Student write-up

PS-II project title: THUMS Occupant Rib Injury Prediction Simulations

Short summary of work done during PS-II: Worked on multiple projects concerning Occupant Safety & Crash Simulations within the team (Organ Injury prediction, Female Spine model adjustment, etc.). Created Python Scripts to scrape and extract required data from LS-Dyna Master Keyfiles. Wrote Python code to automate model dimension & modelling adjustment in ANSA using ANSA-Python scripting interface. Primary Project was based on "THUMS Occupant Rib Injury Prediction simulations".

Tool used (Development tools - H/w, S/w): Python, ANSA, Primer (LS-Dyna), Nx CAD, Animator, Hypergraph, TUC Injury Assessment Tool, MS Excel.

Objectives of the project: To predict Rib Injury & Surrounding tissue damage during a side-on collision of an impactor with the THUMS Human Body Model.

Major learning outcomes: Exposure to industry-standard CAE software, Python Scripting involvement, Essence & Testing of Occupant Safety & Vehicle Crash simulations, Presentation skills & Interpersonal skills.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is pretty relaxed and yet very professional. A very healthy atmosphere is seen while working with seniors. They are easily approachable for getting our queries solved. Our works were well acknowledged and any new frame of thoughts and ideas pertaining to the respective projects were always welcomed. Company expects us to be punctual in meeting our deliverables and expects constant updates regarding work. Great place to work/intern for somebody interested in research & development.

Academic courses relevant to the project: Finite Element Method, CAD/CAM.

Name: VISHNU R (2020H1060140G)

Student write-up

PS-II project title: Study of bolt behaviour in crash test simulation

Short summary of work done during PS-II: M10 bolt is used in my project and create a joint by using this bolt. Proper contacts like automatic general and automatic single surface is given to the joints. Move the top plate in different direction and creating tension and shear on the bolt. Study the force vs time curve of the bolt in different stress sections and study how the bolt is failing in different loading conditions.

Tool used (Development tools - H/w, S/w): ANSA, Animator, LS-Dyna, Metapost.

Objectives of the project: Creating component level test setup for bolted joint and giving different kind of loads to bolt and study the force vs time curve behaviour.

Major learning outcomes: Different softwares like Ansa, Animator, Ls-Dyna, Metapost. Designing of component level test setup for analysis and understand how the bolt force vs time curve behaves in different loading conditions.

Details of papers / patents: Planning to publish a paper but some more data are required.

Brief description of working environment, expectations from the company: The working culture is extremely good. Due to covid first 2 months I am doing work from home. Then I went to office. Manager and all other colleagues are very helpful we can contact them at any point of time. First two months they give training for different tools. That time we did literature survey for project. After that we entered to CAE work. In some day all the members are going together for lunch/dinner team fund is there for these kind of activity.

Academic courses relevant to the project: Yes, FEM, TOEP these subjects are helpful for my project because my project is completely simulation.

Name: SREEHARI H (2020H1060142G)

Student write-up

PS-II project title: Study on the Influence of damping in pre-tension study & Study on the prediction of snap stiffness employing Machine-learning models

Short summary of work done during PS-II: Conducted an extensive study on the effect of damping in the pretension study. Done simulations in NASTRAN and ABAQUS solvers. Developed a machine learning model for predicting the stiffness of snaps used in automotive interior trims.

Tool used (Development tools - H/w, S/w): ANSA, NASTRAN, ABAQUS, META POST.

Objectives of the project: to study the influence of damping in dynamic evaluations involving interference. Look for any universal pattern so an empirical formula can be developed for damping. Prediction of stiffness of snaps used in automotive interior trims by employing machine.

Major learning outcomes: Learnt about various machine learning methods. Got an idea about the implementation of regression analysis. Learnt basic simulations conducted in NVH.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Working environment is very good for learning. The flexible working hours allow us give our best effort in work. All the colleagues are very friendly and we can approach them for any doubts.

Academic courses relevant to the project: Vibrations, Strength of materials, Finite Element Methods.

Name: ANAND A (2020H1060208P)

Student write-up

PS-II project title: BLK - Documentation, Memory optimization

Short summary of work done during PS-II: I was initially tasked with developing the documentation for the code used to generate the BLK report and to study and understand the code and its functioning. Sphinx auto documenting tool was used to develop the documentation for the entire BLK code package. Later on, The task of evaluating the effectiveness of removing deepcopy from the BLK scripts was assigned. The memory profiling of the deepcopy use found that 12 GB of memory could be saved by removing of the deep copy. Further, the effect of removal of the deep copy on the generated report was analyzed and the removal of deepcopy did not yet any changes to the initial report.

Tool used (Development tools - H/w, S/w): Python

Objectives of the project: (i) To develop a detailed documentation for the project code package.
(ii) To optimize the code package to save memory.

Major learning outcomes: Python, Memory profiling, Machine learning.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The work culture at MBRDI is very good and everyone is very helpful. The nature of work is very challenging and MBRDI offers good opportunity to learn and improve ourselves.

Academic courses relevant to the project: Mostly the project was related to Python and ML.

Name: KRISHNA JUGALKISHOR KHATOD (2020H1060272H)

Student write-up

PS-II project title: Preprocessing, post-processing automation tools

Short summary of work done during PS-II: With existing resources to work on automation tools to speed up the common simulation tasks and to help in lifting up the productivity of the teammates and counterparts.

Tool used (Development tools - H/w, S/w): MATLAB scripting, App developer, Guide, GUI, etc.

Objectives of the project: A tool for analyzing pre-processed vehicle data prior to running simulations. A tool with MATLAB GUI to ease post-processing of multiple results files.

Major learning outcomes: MATLAB scripting, Graphical user interface, Preprocessing, postprocessing simulation steps follow up.

Details of papers / patents: Not yet.

Brief description of working environment, expectations from the company: MBRDI provides a positive work environment which helps to increase the work efficiency and so as learning outcomes. The ambience and food provided in the office is the best one could ask for!

Academic courses relevant to the project: Advance Engineering Mathematics, CAD CAM, subjects involving application of automation languages.

Name: GOVIND R B (2020H1410187H)

Student write-up

PS-II project title: Method development for wear prediction of automotive engine gasket component

Short summary of work done during PS-II: The engine's gasket and exhaust manifold are the important exhaust mechanism parts for proper emission of the high-temperature exhaust gases. In an engine, the gasket is placed between the engine block and cylinder head and between the exhaust manifold and the cylinder. The main purpose of gasket is to prevent any gas leakage and to ensure a tight fit joint between the surfaces. It is used to seal the combustion gases within the cylinder and to avoid coolant or engine oil leakage into the cylinder. During the entire exhaust process, the conduction of heat takes place among the main exhaust parts including the gasket and manifold. Since the gasket and manifold are made from different materials which result in it causes differences in the thermal expansion of the materials. Moreover, the cooling system of the engine causes thermal contractions in the materials. These uneven thermal expansions and contractions between the gasket and manifold lead to the sliding of the manifold against the gasket and cause wear of the gasket materials. The project is about developing an appropriate wear model to capture the wear on the gasket surface due to the sliding of the manifold against the gasket through simulation techniques. The developed method was used to simulate the wear on the automotive engine gasket component.

Tool used (Development tools - H/w, S/w): ABAQUS/ Standard, Hypermesh, FORTRAN, Python

Objectives of the project: The objective of this project is to simulate the fretting wear in an engine gasket. The relative movement of gasket and the exhaust manifold leads to wear on the surface of the gasket component. Hence a Finite Element model for simulating the wear on the automotive engine gasket component.

Major learning outcomes: Literature Review: The topic of wear was not new to me but I did not have the conceptual and in depth understanding of the topic. In addition the methods for wear simulation available on the internet are limited. Literature review provide me with the foundation of knowledge on the topic of wear and wear simulation. I could identify the areas of the topic that I could focus more on and the ones I could avoid. This process of collecting information from literatures and understanding topics which are new to me can help me if I am assigned new projects in future.

ABAQUS Training: ABAQUS is one of the most used Finite element software's in the industry. The simulation work of my project primarily uses ABAQUS Finite element software. Hence the ABAQUS Internal training I received from MBRDI was useful for my project work. Even though I used ABAQUS in couple of my individual projects I did not understand how the software works

and how it solves the problems. The one week ABAQUS training gave me exposure to understanding the software more, learnt the keywords that are used in ABAQUS, the type of Analysis in the software, the types of elements etc. which were all helpful for my project work. The software skills gained can be useful in future if I am assigned projects which uses ABAQUS/ software for FE analysis.

FORTTRAN Programming: The main challenge of this project was understanding the FORTRAN Programming language which is be used to simulate wear. FORTRAN is an old programming language which is suited for numeric computation and scientific computing. The entire user defined subroutines used in ABAQUS are developed using the FORTRAN language. Hence it was important for me to understand this programming language. I started scripting simple programs in FORTRAN to understand the working of the language. From there I picked on the Data types, keywords, Operators, Loops, Arrays etc. used in the language. Here also I restricted myself to only the part of the programming language that is useful for my project work. The Archards model used in this project for wear simulation is coded in this FORTRAN language as a subroutine or a function. I was able to find errors in the code and debug all the errors encountered, write new scripts to implement a particular feature for wear simulation etc.

Project specific: Over the course of the project a comprehensive methodology was developed for the simulation of wear in the automotive engine gasket. The topic of wear has been explored to a great extend a successful method for wear simulation was developed after many trials and simulations. The approach combines the Abaqus' integrated adaptive meshing technique and a User defined subroutine developed in FORTRAN programming language. Throughout the course of the project a number of simulation faults and programming errors were encountered. I found trial and error as one of the better methods for problem solving as it helped me to a great extend especially in the FORTRAN programming part of the project. The developed method can be used as a part of the design and development process to reduce the instances of gasket failure due to wear out.

Hands on Work experience: The work experience that I received in this short duration is invaluable and cannot be obtained in a classroom setting. I could learn a lot about my strengths and weaknesses during this period. As internships allow for feedback from supervisors and others who are established in the field, it has also helped me to work on my weaknesses as it gave me an idea on what all areas I need to improve on. It has given me the opportunity to understand the corporate life, experience of working in a team and the discipline I need to have to work in an organization.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is quite good as well as the people here. They appreciate if your work is good and will give you positive feedback. I enjoy working with other people around. I feel that by working in close proximity, we can inspire each other, collaborate better, and communicate effectively to optimize performance. The company expects you to work with a positive and respectful attitude, represent the organization in a responsible manner and work with honesty and integrity. My work has been appreciated by my manager, mentor and other members of the team and I could meet their expectation.

Academic courses relevant to the project: Finite element methods, Tribology, Theory of elasticity and plasticity.

Name: MALIREDDY YUVA CHAITANYA (2020H1410211H)

Student write-up

PS-II project title: Generation of camber contact using GANs

Short summary of work done during PS-II: To generate camber patches from non camber patches to estimate certain functional characteristics of tire. A deep learning approach is used to solve this problem. Deep learning model GAN is used. In GAN two types of GANs are used one is cycle GAN and another one is pix2pix GAN . data augmentation is used to train our pix 2pix model with our in-house data and finally after augmentation of data we trained our both deep learning models and validated our results.

Tool used (Development tools - H/w, S/w): Python.

Objectives of the project: To produce camber contact using deep learning model GAN.

Major learning outcomes: I have been exposed to advanced area of modelling of tyre contact patch. Also explored and gained hands on experience in Deep learning models.

Details of papers / patents: Pix2pix application.

Brief description of working environment, expectations from the company: Every task I learned something now. Here they will provide good support but first you have to try and approach them with your way of thinking. But it's good to know programming knowledge.

Academic courses relevant to the project: No relevant course. My work is completely on deep learning.

Name: GOTTUMUKKUALA HVS SAI RAM VARMA (2020H1410215H)

Student write-up

PS-II project title: Development of vehicle model and implementation of driver model for fault injection simulation

Short summary of work done during PS-II: PS-II gives the exposure for the corporate environment to the students and gives real time experience to students.

Tool used (Development tools - H/w, S/w): MATLAB, SIMULINK.

Objectives of the project: Develop an simple and integrated driver and vehicle model to be used in fault injection simulation for EPS system.

Major learning outcomes: 1. Fundamentals of vehicle dynamics course 2. EXploring of simulink software 3. Enhanced skills related to vehicle model and driver model.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: MBRDI provides with flexible work timings to the internal employees and every team is giving support to the interns to move forward in their work.

Academic courses relevant to the project: Vehicle dynamics, Control systems.

Name: PARTH JIGARBHAI JANI (2020H1480296H)

Student write-up

PS-II project title: OpenFOAM: Robust Wiper Dynamic

Short summary of work done during PS-II: Done a refinement in static wiper case, exploring a dynamic code implementation in OpenFOAM.

Tool used (Development tools - H/w, S/w): OpenFOAM, Paraview.

Objectives of the project: To replicate a cfd case of commercial software to an open source software.

Major learning outcomes: CFD Turbulence modeling, OpenFOAM code compilation, OpenFOAM dynamic case understanding.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Company has a very friendly environment. All mentors, managers and colleagues were supportive and helped a lot in project.

Academic courses relevant to the project: CFD, Fluid Dynamics, Research Practice.

Name: PRANSHU JAIN (2020H1480297H)

Student write-up

PS-II project title: Data based modelling using ML

Short summary of work done during PS-II: 1-D analysis of power train on GT Suite, added exploratory data analysis, linear regression, grid search method in ADAPT GUI.

Tool used (Development tools - H/w, S/w): ADAPT, Spyder, Jupyter notebook.

Objectives of the project: We are solving complex non-linear interactions of thermal variables in a power train cooling system using machine learning and reproducing the system using machine learning techniques.

Major learning outcomes: Data-based modeling helps in the design of experiments Simulation for each and every case is not possible, so to reduce the computation cost and time, data modeling is done.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: NA

Academic courses relevant to the project: Fluid dynamics, IC engine, thermodynamics.

PS-II Station: Microchip, Nanakaramguda

Faculty

Name: Sanjay Vidhyadharan

Student

Name: JANKI (2020H1240084H)

Student write-up

PS-II project title: Verification of Core Direct Digital Synthesis

Short summary of work done during PS-II: Major learning consists understanding of different verification environment which includes the functions of generators, driver, monitor, scoreboard etc.

Tool used (Development tools - H/w, S/w): Libero, Questasim.

Objectives of the project: Verification of direct digital synthesis.

Major learning outcomes: Learnt languages: system verilog, perl.

Tools used: libero, linux, questasim.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is very friendly. Got a lot of help from teammates especially from manager. No discrimination faced. Got lot of time and help to understand and learn new concepts (as I had very little knowledge of verification environment development). My manager asked me to join the company in offline mode. This helped me a lot in understanding the workflow and ramp-up process was very smooth. Expectations from company: my basic knowledge on digital design and verilog were tested during interview.

Academic courses relevant to the project: Digital electronics, VLSI architecture, ADSP, Reconfigurable Computing (esp the lab on verilog), courses related to FPGA, verilog language and digital were helpful.

Name: SANDEEP AGARWAL (2020H1400116G)

Student write-up

PS-II project title: G6 SERDES Subsystem Verification

Short summary of work done during PS-II: This project on a whole encapsulates the complete process that takes place in making of testbench structure for verification and analysing the coverage of the design. Following all these steps that a Verification Engineer would follow to achieve functional correctness of the module. While going through the verification flow the engineer would get to know the errors if any present in the design with help of the tools and can resolve them accordingly. This project also helps in understanding the tool flow and the practical difficulties while verifying and also the practical requirement of certain checks that are present in the flow and also understand the fatality of the errors if they are not rectified.

Tool used (Development tools - H/w, S/w): Modelsim, Questa formal tools.

Objectives of the project: The work is to develop verification architecture for SERDES block of G6 FPGA. The logic and structure verification will test all of features logically before tap-out. It also verifies architecture testability for all features and switches.

Major learning outcomes: Gained good command over different verification tools. System Verilog coding proficiency by following the guidelines and better coding styles.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work culture at the company is of high standard and very comfortable. The management is very supportive and the team is very welcoming to the new joiners, helping with all the queries no matter how small it is.

Academic courses relevant to the project: Hardware Software Co-design,

Name: VALLEPU VANNURU (2020H1400232H)

Student write-up

PS-II project title: AMS verification

Short summary of work done during PS-II: Experience in building the mixed signal verification environment at chip level with Verilog view at top level and Verilog AMS view for analog blocks. debugged integration issues and uncovered critical bugs. used Questa ADMS with ELDO and ADIT. Experience in integrating digital and analog simulators from two different tool vendors. Developed mixed signal verification environment with Verilog view at top and Spice view for analog blocks by interfacing Digital simulator from MentorGraphics with Analog simulators like Hspice and Finesim from Synopsys, Developed Verilog AMS models for wide variety of analog circuits like bias generator, calibrator, charge pumps, phase generator, voltage regulator, opamps, flashcell, band gap reference block, sense Amplifier. Developed and implemented the Power Aware verification methodology at block level to check floating nodes and isolation pullups. Reviewed design spics and prepared verification plans, developed verification environment for mixed signal blocks utilizing Questa ADMS, worked on automating regressions. involved in automating the verification flows using the scripting languages such as Perl, C. Familiar with database management (version control) using SVN. Working on block level transient, DC, AC analysis, Monte Carlo analysis. worked on Power down analysis for various analog blocks to check the leakage currents. Familiar with using advanced verification tools and skills such as System Verilog testbench, UVM. Initiated the UVM-AMS development and working on it to take it to next level.

Tool used (Development tools - H/w, S/w): Symphony, Questa sim, synopsis, Cadence.

Objectives of the project: Verify analog and mixed signal block level and chip level circuits.

Major learning outcomes: How to verify analog circuits, what are major things we need to verify these are the major things I learnt.

Details of papers / patents: Tried to publish IEEE paper, but it rejected by publication.

Brief description of working environment, expectations from the company: Experience in building the mixed signal verification environment at chip level with Verilog view at top level and Verilog AMS view for analog blocks. debugged integration issues and uncovered critical bugs. used Questa ADMS with ELDO and ADIT. Experience in integrating digital and analog simulators from two different tool vendors. Developed mixed signal verification environment with Verilog view at top and Spice view for analog blocks by interfacing Digital simulator from MentorGraphics with Analog simulators like Hspice and Finesim from Synopsys, developed Verilog AMS models for wide variety of analog circuits like bias generator, calibrator, charge pumps, phase generator, voltage regulator, opamps, flashcell, band gap reference block, sense Amplifier. Developed and implemented the Power Aware verification methodology at block level to check floating nodes and isolation pullups. Reviewed design spics and prepared verification plans, developed verification environment for mixed signal blocks utilizing Questa ADMS, worked on automating regressions. involved in automating the verification flows using the scripting languages such as Perl, C. Familiar with database management (version control) using SVN. Working on block level transient, DC, AC analysis, Monte Carlo analysis. worked on Power down analysis for various analog blocks to check the leakage currents. Familiar with using advanced verification tools and skills such as System Verilog testbench, UVM. Initiated the UVM -AMS development and working on it to take it to next level.

Academic courses relevant to the project: Yes.

PS-II Station: Micron Technology India Operations LLP, Hyderabad

Faculty

Name: Pawan Sharma

Student

Name: ASHWIN MANOJ (2017B1AA1457H)

Student write-up

PS-II project title: Test coverage validation tool

Short summary of work done during PS-II: Worked on the development of a test coverage validation tool. The tool was python based and would be able to parse through the data sheet extracting the spec information. I worked on the coding the main script after that we collaborated with the data science team for further development.

Tool used (Development tools - H/w, S/w): Python.

Objectives of the project: Develop a test coverage validation tool to parse data sheet and improve spec coverage.

Major learning outcomes: Python and understanding of datasheet.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Student should know basic programming and be interested in learning about NAND.

Academic courses relevant to the project: DD, ADVD, MEC.

Name: MANDHADI THIRIBHUVAN REDDY (2017B3A71116H)

Student write-up

PS-II project title: Web Application Dashboard for Layout Development Team

Short summary of work done during PS-II: I was allotted a role in CAD Team for developing a web Application. I was helping team of 3. Front end part was more allotted to me, other guys used to take care of Backend. Based on command over skills one will be assigned tasks, accordingly one will be trained as well. As I was allotted a bit late, my learning was only for a week then asked to work on a real time project with development team. Since its a Semiconductor company, Computer Science will have very less role to play. So overall my work was never hectic.

Tool used (Development tools - H/w, S/w): Software: Sublime text editor, Git, Linux terminal.

Objectives of the project: Using Python Flask Framework, developing a Web Application in CAD Team, which will help Layout members to track progress of project based on a chip.

Major learning outcomes: Full stack development in Python Flask, Git + Bitbucket, Linux environment basics, MySQL DB.

Agile Methodology of a Software Development - Sprints planning & tracking through Jira tickets, JavaScript, HTML, CSS, jQuery, Some EDA tools, Collaboration in Team.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Micron have a diverse Community, cultures. People encourage new college graduates. Mostly you will know people in your team more than others. The task completion is more focused. I felt there was good amount of freedom with Managers as well especially in the team I was allocated. Company encourages innovations, creativity.

Academic courses relevant to the project: Software Engineering, OOP, DSA, DBS.

Name: NAMAN KOTHARI (2018A3PS0370P)

Student write-up

PS-II project title: Host Interface verification of SoC controller

Short summary of work done during PS-II: Designed the test flow for dual port linkup for PCIe, design of gate level simulation tests for different flavours of tests, debug of failing tests in the regression.

Tool used (Development tools - H/w, S/w): Verdi, System-verilog, python, C, Git, Gvim.

Objectives of the project: Debugging of failing test cases for host Interface, new feature addition to the host Interface IP.

Major learning outcomes: Got to know about the overview of the SoC and NAND controller, overall test flow environment and design and debug of tests.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Company work culture is very supportive and motivating. Future test cases ownership and new feature development in the upcoming projects.

Academic courses relevant to the project: Digital Design, ADVD, Computer Architecture, C Programming.

Name: BHAMIDIPATI VENKATA SIVA SAI KIRAN (2020H1230233P)

Student write-up

PS-II project title: Host interface verification on SoC

Short summary of work done during PS-II: Verification of design using test cases developed using system verilog in C environment.

Tool used (Development tools - H/w, S/w): System verilog, C, Verdi, Python.

Objectives of the project: Design verification of host interface IP.

Major learning outcomes: Verification methodology.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Expected to take test ownership soon once we start as Full time employees. Expected to understand full end to end flow.

Academic courses relevant to the project: Test and testability.

Name: AISWARYA SATHEESH (2020H1230320H)

Student write-up

PS-II project title: Host Interface Verification of SoC

Short summary of work done during PS-II: Design verification of SOC aims at develop and debug of the test cases which checks the functionality of IP blocks of SOC. At SoC design level, you mainly have to focus on the top level functionalities of the SoC along with verifying whether the intercommunication between the sub-blocks occur properly or not.

Tool used (Development tools - H/w, S/w): Verdi, Python, Linux, Git.

Objectives of the project: Comprehensive understanding of the architecture of NAND controllers and testing its functionality.

Major learning outcomes:

- Understood architectural overview on NAND controllers.
- Test case development through C and system Verilog, automation through Python.
- Debugging and analysis of test waveforms through Verdi.

Details of papers / patents: As a part of this project / internship worked on the design and debug task for the host interface.

Brief description of working environment, expectations from the company: With a comprehensive understanding of the overall NAND controller architecture understand how the processor different IP blocks etc communicates. Design test for the blocks to check its functioning and proper working. By the scope of training given we are expected to take up test ownership and debug tasks specific to the host interface block.

Academic courses relevant to the project: System verilog, C programming, Python, Computer architecture.

Name: NILAMBAR SAHA (2020H1230329H)

Student write-up

PS-II project title: SPF Flow in NAND Environment

Short summary of work done during PS-II: The role of me as a CAD engineer was to work in the simulation and netlisting team. I understood the flows of each of these functions and got to automate and debug some of the flows. I also had a part in qualifying a new version of StarRc and also debug some major errors in their algorithm. Device parameters testing was also a project I was a part of. There I learnt all the device parameters and their importance and how the rule deck identifies each of these parameters and how to debug in case of any errors.

Tool used (Development tools - H/w, S/w): Linux, Cadence virtuoso, SKILL, Python, Shell scripting.

Objectives of the project: To understand and improve the netlisting and spf flow in the NAND environment.

Major learning outcomes: I understood what spf is and how it is relevant in the semiconductor industry. I also understood the prerequisites to generate an spf and the backend flow.of the same. I learnt to debug spf errors and also learnt how to read and understand the LVS rule deck. Automating spf and netlisting flows were also a part of the learning.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work environment is amazing. The seniors and other team members are extremely helpful and approachable. New ideas are encouraged and taken into account and we get a clear idea what is expected from us. As far as expectations is concerned more than knowledge, sincerity, hard work and urge to learn is what is expected from us.

Academic courses relevant to the project: All courses with experience of cadence virtuoso was helpful.

Name: NIHIT KAPOOR (2020H1230330H)

Student write-up

PS-II project title: Device Parameter Testing, New Gen (Jenkins / Avocado) based RTEST

Short summary of work done during PS-II: Device parameter testing aims at validating whether device parameters are being correctly extracted in the netlists or not. In this project first devices are divided into different categories based on connectivity (isolated, shared / unshared drain / source) and then different types of schematic and layout structures created to cover all the different combinations. The layouts have been cleaned for LVS to do the extraction. Then the HSPICE and STARRC netlists are generated and are compared with the layout for different parameters like ports order, model name, length, and width of gate, sharing of devices etc. If errors are observed, then it is reported for further debugging. To automate the device testing project after manually testing it we needed to automate these steps as manually testing every time whenever there is a change in version is very time consuming. So, for that only RTEST

comes into use. RTEST is a regression system which runs on daily basis, its main functionality is to compare the golden file with the output file and return pass or fail status.

Tool used (Development tools - H/w, S/w): Cadence Virtuoso, Linux, Python.

Objectives of the project: To qualify projects for SPF extraction and after manually qualifying the projects for SPF extraction, automating the process using regression system (RTEST).

Major learning outcomes: Learnt about SVRF language, to debug errors after reading log files and regression testing.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is quite good, mentor as well as the team is very supportive. Expectation from the company is to provide a good learning environment as it is providing now.

Academic courses relevant to the project: PMMD, VLSI design, Analog IC design (For layouts)

PS-II Station: Microsoft India Development Center, Hyderabad

Faculty

Name: Chetana Anoop Gavankar g

Student

Name: KUSHAL CHOUDHARY (2018A3PS0375P)

Student write-up

PS-II project title: M365 Growth

Short summary of work done during PS-II: The work done in PS II spanned all the different areas of software development. 1. Security Development Lifecycle - This project focused on integrating the necessary security tools required by Microsoft in the build pipelines of the team. 2. Actions Websdk - In this project I had to add new features to the websdk for Kaizala Actions for the users to use the websdk to integrate the actions in their webapp using websdk.

Tool used (Development tools - H/w, S/w): Azure, Typescript, C#, ASP.Net.

Objectives of the project: Projects were aimed to improve the existing product security and adding new features to the products being currently developed.

Major learning outcomes: Learnt that security is really important part of the software development cycle in big MNCs. New technologies such as Typescript, C#, ASP.Net, Azure pipelines and Azure app Insights.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is great in the company, managers and peers are very supportive and helpful.

Academic courses relevant to the project: OOP.

Name: GARIMA SHARMA (2018A7PS0090G)

Student write-up

PS-II project title: Migration from EV2

Short summary of work done during PS-II: Worked on developing various reconcilers for deploying different kinds of resources. Also worked on rewriting the resources from Jsonnet to C#.

Tool used (Development tools - H/w, S/w): Visual Studio, Docker, AKS, M365 office.

Objectives of the project: Work on the migration from EV2 to Resource Fabric (C# based) code. EV2 and ADO should be completely replaced.

Major learning outcomes: C#, .NET, Object Oriented Programming, System Design.

Details of papers / patents: None

Brief description of working environment, expectations from the company: It was online. All the team members and manager were supportive.

Academic courses relevant to the project: OOPs, DSA.

Name: ANIRUDH AGRAWAL (2018A7PS0099H)

Student write-up

PS-II project title: Zoom improvements and creating feedback surveys in Excel

Short summary of work done during PS-II: Worked on improving zoom experience in Excel for a better user experience and created a survey to collect feedback from the users.

Tool used (Development tools - H/w, S/w): Programming Languages like:- C# and TypeScript, and Azure.

Objectives of the project: To make zoom improvements and create feedback surveys in Excel.

Major learning outcomes: Learnt about various programming languages, how to approach a problem more professionally as well as about life and culture at the organization.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was very good, and the team was very supportive.

Academic courses relevant to the project: DSA, Software Engineering.

Name: HARSHAN B (2018A7PS0166P)

Student write-up

PS-II project title: Azure Load Testing - Enhancing Resource Manager and Generating Data-Plane Client SDK

Short summary of work done during PS-II: Azure Load Testing is a fully managed load-testing service built for Azure that makes it easy to generate high-scale load and identify app performance bottlenecks. The service enables developers and testers to generate high-scale load and run simulations that reveal actionable insights into app performance, scalability, and capacity with a fully managed load-testing service. Apache JMeter, a Java-based open-source software designed for measuring performance of variety of service with a focus on web applications, is currently used as the load generation engine. My work in the team is associated with enhancing a core backend module called Resource Manager. Apart from enhancing the telemetry, I work on identifying issues and implementing features and fixes in this module. My work includes improving the networking capabilities of the service and automating some core processes without causing downtime. I worked on REST API Docs generation and generation of language-specific data-plane SDKs (Software Development Kit). The REST API Docs are the official source of truth regarding the APIs in case users want to interact with the service. These SDKs enable developers to interact with the service through libraries for programming languages like C#, Java, Python, etc. and are an extension to the REST APIs.

Tool used (Development tools - H/w, S/w): C#, Python, Java, Docker, Kubernetes, Networking, Azure.

Objectives of the project: Enhance Resource Manager Telemetry, Long Running Tests Private Preview, Parallelize Resource Manager, Docker Port Mapping, Automate Certificate Rotation.

Major learning outcomes: I learnt how to work in a team environment and how to effectively contribute to the team and build upon work done by others. I learnt a lot of technical concepts from security to scalability including networking and virtualization. Also learnt about load testing using JMeter and how to program in C# mainly.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is very friendly, everyone in the team including managers and mentors are welcoming and very helpful. It is a great team to work and have fun at the same time. As far as the expectations of the company are concerned, everyone is assigned tickets or tasks at the start of every month or every 2 months termed as "sprints". The exact ETA for the action items are decided by the team members themselves, manager and PM only highlight a vague timeline for the deliverables. It is up to the developers to decide how much they want to take up. So, it is expected that we deliver the action items as we get to choose the ETAs. This is great for work flexibility.

Academic courses relevant to the project: Networking, Network Programming, Object Oriented Programming, Data Structures and Algorithms.

Name: UNMESH ROY (2018A7PS0175P)

Student write-up

PS-II project title: Content Moderation Platform for Bing

Short summary of work done during PS-II: Worked on design and implementation of a dashboard for new CMP platform to display key insights and metrics for better monitoring. Worked on optimizing and cleaning up old entries from COSMOS through a scheduled executable. Develop IaC for new logic apps through Azure ARM templated that will enable automatic resource creation and deployment.

Tool used (Development tools - H/w, S/w): Azure, Power BI, COSMOS, .NET Framework.

Objectives of the project: - Ensure to target key workflows and onboard to CMP platform - Work on end-to-end CMP modernization and add value to completion of existing requirements.

Major learning outcomes: - Learnt and understand microservice communications, developing distributed systems and API communication.

- Developed production level services with high code quality and efficiency.
- Apart from technical side, learnt key aspects of team collaboration, culture and architecture design and planning.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Very friendly and inclusive working environment. Got an opportunity to work with multiple member of the team due to the nature of the project. Everyone was very approachable and ready to help us.

Academic courses relevant to the project: Object Oriented Programming, DBMS.

Name: MANISHA JHUNJHUNWALA (2020H1030125H)

Student write-up

PS-II project title: Feature Development and Enhancements in Microsoft Outlook Web

Short summary of work done during PS-II: I was a part of OWA Groups Team (Outlook Web App). Groups is a new feature of Office 365 added to Outlook. Groups give users a shared place where teams can work and collaborate. It lets you work with your friends and family on a common goal, send messages to the group, share files, schedule events on a group calendar, and more. It enables you to have a shared inbox, calendar, and even a document library. These features can help centralize our team communication, tracking, scheduling, and resources. My project entails getting a thorough understanding of the existing working of the Outlook Mail and Groups web application, learning the concepts of front-end development using ReactJS and Satchel framework and develop new features in the Groups and Monarch space. I have worked on several accessibility related features and defects in OWA in my ramping-up phase to get a hold of the codebase. Thereafter, I have worked on 2 major features out of which one has already been deployed to Dogfood ring which comprises of all the developers of Microsoft. The first feature was to introduce the capability of a new action – forward in the Folder Groups Rules. The second feature was to implement the workflow to create a new event on an Outlook.com Groups calendar from Groups Home experience. After the completion of dev phase, I have also analyzed the performance of the feature using Azure telemetry dashboards.

Tool used (Development tools - H/w, S/w): Reactjs, Mobx, Satchel, GraphQL, Accessibility Insights.

Objectives of the project: Understanding of the codebase very thoroughly and then developing the new feature, all the while following a clean code paradigm – code that's readable and easy to integrate with the existing code. Learnt about how accessibility in websites work.

Major learning outcomes:

1. Learnt new tech stacks – ReactJS, Mobx, Satchel, GraphQL
2. Learnt about different accessibility tools
3. Understanding a huge codebase and adding new feature onto existing inter wired interfaces and classes
4. Writing code in professional manner
5. Leveraging internal product wiki / docs to understand the architecture
6. Learnings through Commits and code Reviews after each major breakthrough
7. Adhering to the existing coding style and pattern
8. Channeling the ideas correctly for effective communication.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very inclusive environment with a very nice work life balance. Had a steep learning curve with many challenges. The team and manager were very helpful, supportive and skillful. The organization respects its employees contributions and invests in its growth. It never asks for over time work or never had unexpected realizations. Had a wonderful experience.

Academic courses relevant to the project: OOPS, Distributed systems, DS algorithms.

PS-II Station: Morgan Stanley - Strats and Quant, Mumbai

Faculty

Name: Ambatipudi Vamsidhar

Student

Name: RISHAV MISHRA (2017B3A70557P)

Student write-up

PS-II project title: Metatdata Validation

Short summary of work done during PS-II: I was part of the team's project. Our team was working on a service where we offered a google like system to every user of the firm to discover and access the dataset of the firm. In the backend, we used to validate the metadata of the dataset.

Tool used (Development tools - H/w, S/w): Python, FASTAPI, MongoDB.

Objectives of the project: To make dataset discoverable and accessible to every user in the firm.

Major learning outcomes: Learnt Python language and FASTAPI server.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: I was part of the global team, so my meetings were generally in the evening from 5:30-8:30/9Pm. Working environment was good. It was not hectic, but sometimes I found it difficult to match the timing of the meeting which were according to EST. Later they ensured that for Indian people, meeting should get over till 8:30 Pm.

Academic courses relevant to the project: DSA, DBMS, C Programming, OOP.

Name: NAKHATE ANAND THEERTHA (2017B3A70660G)

Student write-up

PS-II project title: Firmwide Metadata Manager

Short summary of work done during PS-II: I was part of the data team where we manage, process and model the data in the firm. I was part of a major firm wide project that manages the entire firmwide data. A lot of my learnings were based on understanding and managing data. I learned to build a complete system including effective validation, database system and APIs for different functionality. I was also working on querying different databases. I worked on the firm's risk systems to create proper pricing tables for swaptions in different regions.

Tool used (Development tools - H/w, S/w): Scala, Python, Q/KDB+.

Objectives of the project: Building a tool that helps to store, maintain, update, validate, search metadata of all the datasets in the firm, search datasets in the firm based on the metadata and build endpoints to query data from databases as a simple python library.

Major learning outcomes: I understood about different different fixed income assets and pricing of swaps / swaptions etc. I learned to build and integrate an end to end architecture from scratch. I learned to write production level code. It really improved my communication and networking skills.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: I had completely virtual internship but the next batch of interns were asked to work offline. Your work load and timings are heavily related to the team that you are allotted. I was working in a global team so i had to schedule my day in a way that I overlap with India, EU and US. The hierarchy is pretty horizontal and you can connect with anyone anytime irrespective of their post. Team members are extremely helpful. You will be working on tools using Morgan Stanley proprietary software and wrapped to make risk free so the tech that you work on may not be the latest tech in the industry. It is difficult to find documentation for a lot of tools because of this.

Academic courses relevant to the project: DRM, FinMan, FRAM, DSA, DBMS, OOP.

PS-II Station: Morningstar - Quantitative Research, Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: ANIRUDH RAMESH (2017B3A40533G)

Student write-up

PS-II project title: Model Validation and Data Cleaning in Risk-Models for Quantitative Research

Short summary of work done during PS-II: There are various projects in Quant Research, and I was allotted the Risk-Model project. My work involved validating Risk-models and implementing new features in the validation notebooks. I also got to research and suggest new changes in the methodology which would improve the calculations and results for the model.

Tool used (Development tools - H/w, S/w): Python, Amazon Web Services (AWS).

Objectives of the project: The aim of this project is to find out faults (if any) in a particular risk-model in terms of data integrity or methodology and create different checkpoints in Jupyter notebooks to check / test the data integrity of a security/fund in the model.

Major learning outcomes: I learnt how Quantitative Finance is used and applied in real world application to minimize Investor Risk and maximize profits. In terms of coding skills, I learnt to use Python and SQL from scratch and implemented that knowledge in my day-to-day work.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The people in the team are very friendly and encouraging. The interns are given responsibilities and the quality of work given to an intern is great and is no different than a permanent employee. The team encourages asking as many questions as possible to fully understand the reasoning behind each step in a particular model. People get to learn a wide range of topics in Finance and can also understand the software knowledge to implement the financial improvements that you suggest. Overall, this is a great place to learn Quantitative Finance and it depends on the student on how he/she utilizes his/her time here. The more you ask for work, more you would learn.

Academic courses relevant to the project: SAPM, Applied Econometrics, FRAM, Financial Engineering.

Name: MANAV MALHOTRA (2017B4AA1016G)

Student write-up

PS-II project title: Construction of Cryptocurrency Index

Short summary of work done during PS-II: Deciding a data source, cleaning data, analyzing data, constructing index, Benchmarking relative performance.

Tool used (Development tools - H/w, S/w): Python & Pandas.

Objectives of the project: Benchmarking Digital Assets Market.

Major learning outcomes: Index Construction, Factor Investing & Python.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good Work life balance, supportive team - many are BITSians.

Academic courses relevant to the project: DRM.

PS-II Station: MSCI (NPD - Index Research), Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: MADHAV MISHRA (2017B3A10480P)

Student write-up

PS-II project title: NPD (New Product Development)

Short summary of work done during PS-II: I was involved with the Factor ESG and climate Index development team where i was given an opportunity to create multiple Indexes of different types including factor ESG, diversified multifactor and factor ESG plus climate indexes, along with the complete analysis of the results, I was also given the opportunity to create the indexes both on the Index creation portal and through python scripts.

Tool used (Development tools - H/w, S/w): Python, Microsoft Office Suite.

Objectives of the project: 1) To Create New Indexes and enhance the current indexes as per the client requests 2) Ensure Smooth Rebalancing of the Indexes.

Major learning outcomes: The projects helped me to understand the core fundamentals of Equity Research and Index Development, Along with more hands on experience in working on real time projects using software ranging from Python to Microsoft Office.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment at MSCI is extremely good with great mentorship and training, The working is also flexible and is based on the workload in the team, People are very supportive and always ready to help, You are trusted with important real time work and also given training to do it properly along with increased ownership on the way.

Academic courses relevant to the project: Moderately useful.

PS-II Station: National Centre for Biological Sciences (NCBS), Bengaluru

Faculty

Name: Bharathi R

Student

Name: AYESHA KHATOON TUNGEKAR (2020H1290002H)

Student write-up

PS-II project title: Investigation of degradation dynamics of BRCA1 protein - assay development and identification of cancer models

Short summary of work done during PS-II: To study the degradation dynamics of BRCA1 in mammalian cells as well as to understand the domains of BRCA1 that are critical for the degradation of BRCA1, transfection-based experiments in HEK293T and MCF7 cells using plasmids expressing full-length and BRCT-domain deleted- BRCA1 protein was performed. Cycloheximide treatment followed by western blot will help us to study the differences in protein half-life without any interference from protein transcription and translation. MG132, which is a 26S proteasome inhibitor, will help us to validate proteasome-mediated degradation. Following transfection of cells, we gave the cells cycloheximide treatment of different cycloheximide concentrations for up to 6hrs to obtain the optimal concentration for capturing the BRCA1 degradation dynamics. The optimised cycloheximide assay obtained from the above experiments will be employed in the future to discover regulators of BRCA1 protein in the host laboratory.

Tool used (Development tools - H/w, S/w): Mammalian cells-HEK293T& MCF7, Small molecular tools-Cycloheximide and MG132, Fluorescence microscope, TECAN plate reader.

Objectives of the project: 1) To develop cycloheximide based assay for studying degradation of BRCA1 protein 2) To identify cancer models for investigations of regulation of BRCA1 protein level

Major learning outcomes: The project helped in gaining in depth understanding and function of BRCA1 protein structure and role. It helped to study degradation dynamics of BRCA1. Techniques learnt during at the PSII station: 1) Cell Culture Techniques: Cell revival, cell splitting, cell counting and seeding, cell transfection, cycloheximide assay, cell lysate collection 2) SDS-PAGE AND Western Blot 3) Transformation by heat shock method and plasmid isolation 4) Literature search on BRCA1 regulators 5) The human protein atlas database.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: CCBT offered excellent research facilities and has good collaborations. Every member in the lab is supportive and helpful. It offers an optimistic and encouraging atmosphere to work.

Academic courses relevant to the project: Yes

PS-II Station: National Chemical Laboratory (NCL), Pune

Faculty

Name: Santosh Sopanrao Khandgave

Student

Name: PRANAV ROY (2018A1PS0010H)

Student write-up

PS-II project title: Chemical Engineering aspects of Digital Twins in Chemical Plants

Short summary of work done during PS-II: Worked on digital twins and designed its applications in several industrial sectors.

Tool used (Development tools - H/w, S/w): Python.

Objectives of the project: Studies on Digital Twin.

Major learning outcomes: Understanding Digital Twin, ML, IoT.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Online mode, direct discussions with mentor.

Academic courses relevant to the project: ML, PDC, PDP.

PS-II Station: National Instruments Systems (India) Pvt. Ltd., Bengaluru

Faculty

Name: Rekha A

Student

Name: KARMARKAR ADITYA MANOJ (2020H1120267P)

Student write-up

PS-II project title: Improvement in the ATS setup of Indcomm SW Sustaining Team

Short summary of work done during PS-II: The project aims at improving the internal setup of automatic tests by automating as many processes as possible. As a part of this broad goal, one major activity is to migrate the codebase of CANOpen protocol driver from a legacy tool to the new Git-based Azure Repos source control system. This would help perform the integration, testing, and deployment of driver code through a unified environment, making a good improvement in the overall management. Followed that, other two process improvements were migrating the test scripts for other 2 drivers in AzDO and automating the installation testing. As an another activity towards enhancing the future support of the drivers, all the drivers were enabled with the windows 11 support too.

Tool used (Development tools - H/w, S/w): Git, Azure Repos, VS Code, Proxmox, VMware.

Objectives of the project: Migrating the codebase, tests for some drivers and adding windows 11 support.

Major learning outcomes: CI/CD pipeline creation using yaml, NI specific build process, Automatic Testing Framework.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work environment is very flexible and conducive, people are willing to help. Company sets reasonable expectations in regards to completion of tasks and also expects us to own them, drive them and be proactive in raising the concerns if any.

Academic courses relevant to the project: Cloud Computing.

Name: VIKRAM KUMAR (2020H1240100P)

Student write-up

PS-II project title: Prototype for IEEE 802.11ba (Wake Up Radio)

Short summary of work done during PS-II: I was part of the WLAN Algorithm development team in Segmenting Software Division (SSD). The team works on the implementation of algorithms for WLAN measurements in LabVIEW. My project was to design a prototype for IEEE 802.11ba standard at Physical Layer, also known as Wake-Up Radio (WUR). I worked on the transmitter side of WUR, in which I implemented various fields of WUR PPDU, i.e., Physical Layer Protocol Data Unit, for 20 MHz, 40 MHz and 80 MHz channel bandwidths. After implementation of different fields, transmitted waveforms were generated for Wake-Up Radio.

Tool used (Development tools - H/w, S/w): Labview.

Objectives of the project: To build prototype for the IEEE 802.11ba (Wake-Up Radio) standard.

Major learning outcomes: • Learnt how to use LabVIEW and implementation of different modulation techniques such as QAM, OFDM in it.

- Knowledge of different IEEE 802.11 WLAN standards and key differences between them at physical layer.
- Learnt PHY implementation of IEEE 802.11ax (wi-fi 6) and IEEE802.11ba Wake-Up Radio (WUR).

Details of papers / patents: None

Brief description of working environment, expectations from the company: Overall, the working environment of the company was really good. The manager, project mentor and other senior engineers of the team were really supportive and always ready to help whenever required. The company expects the students to be honest, enthusiastic and diligent towards their work.

Academic courses relevant to the project: EEE G592-Mobile & Personal Communications, EEE G622 - Advanced Digital Communications.

PS-II Station: NBC Bearings, Jaipur

Faculty

Name: Nithin Tom Mathew

Student

Name: PATEL DHRUV MAYANKBHAI (2020H1410214H)

Student write-up

PS-II project title: MBD & FEA of bearings

Short summary of work done during PS-II: Explicit dynamic analysis of the bearing in the ANSYS commercial software to carry out the Finite Element Analysis of the model. Also, studied the forces coming on the cage because of rotation of the ball.

Tool used (Development tools - H/w, S/w): ANSYS, Excel.

Objectives of the project: To setup a Multi Body Dynamic (MBD) methodology for calculation of forces acting on bearing due to rotation of rolling element to cage and further calculate the impact of calculated forces on cage using Finite Element Methods (FEM).

Major learning outcomes: Simulation of bearings at different loading condition.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment: Internship at NBC bearings is totally work from home. Its timing is flexible i.e., there

is no login or logout time you can do work at your own time. All the things related to project, should be managed by your own.

Academic courses relevant to the project: Yes.



PS-II Station: NCR Corporation, Hyderabad

Faculty

Name: Jyotsana Grover

Student

Name: NAMA RAVI TEJA (2020H1030143H)

Student write-up

PS-II project title: Convenience and fuel retail

Short summary of work done during PS-II: Fuel automation server scripts are implemented to install virtual machines, test the automation scenarios and collecting the logs from the scenarios. A few features are implemented to test the production environment.

Tool used (Development tools - H/w, S/w): Powershell, BDD, Python.

Objectives of the project: The objectives of this project is to get a clear understanding and writing of the fuel automation scripts, used to test the product environment, and analysis of the sites logs using Big Query in Google Cloud Platform.

Major learning outcomes: Understanding code base, powershell scripting, BDD, Big Query.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is good in the company with good work life. The support from the mentors and manager really helps in the learning process.

Academic courses relevant to the project: ACN, AOS, DDS, DW.

PS-II Station: Netcore Solutions, Mumbai

Faculty

Name: Benu Madhab Gedam

Student

Name: ABHINAV RAMAN SINGH (2020H1490857P)

Student write-up

PS-II project title: Product Management

Short summary of work done during PS-II: Working under web and app section of Netcore CEE, where was working with the engineers and designers to develop upcoming features and products which are yet to be released and hence can not be disclosed.

Tool used (Development tools - H/w, S/w): JIRA, Figma.

Objectives of the project: Work in Product domain and optimize the efforts on products and features.

Major learning outcomes: Essentials of product management.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Great working environment as the place is ranked among one of the best places to work with excellent HR practices.

Academic courses relevant to the project: Marketing Research

PS-II Station: Nomura Global Risk, Mumbai

Faculty

Name: Ambatipudi Vamsidhar

Student

Name: RAGHAV KABRA (2017B3A30566P)

Student write-up

PS-II project title: Nomura Global Risk

Short summary of work done during PS-II: Responsible for the Post trade support and Automation & efficiency improvement projects, which were focused on BAU tasks, reporting, ad-hoc requests, creation of Excel/VBA/Macro based tools along with Dashboard creation from scratch.

Tool used (Development tools - H/w, S/w): PowerBI, Bloomberg, Excel, VBA.

Objectives of the project: Financing Risk Intern - Prime Brokerage Team.

Major learning outcomes: Advanced Excel, PowerBI, Bloomberg, Risk Metric analysis.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Great working environment, and decent work timings (not flexible as works on market timings). Else the people in the team are amazing and very helpful.

Academic courses relevant to the project: SAPM, DRM, BAV, FRM.

Name: SHIVAM MILIND AKARTE (2018A4PS0077H)

Student write-up

PS-II project title: Risk Methodology Development

Short summary of work done during PS-II: Implemented four variations of their in-house stochastic models in python. Generated certain factors which help in extrapolating trade level exposure to portfolio level exposure. Improved efficiency of conducting BAU activity. Participated in annual BAU deliverables.

Tool used (Development tools - H/w, S/w): Python, Excel.

Objectives of the project: Automate some of the BAU work.

Major learning outcomes: Brief understanding of the stochastic models used to calculate exposures specifically expected exposure from credit risk.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Nomura is an amazing place to work at. Transition from academic mindset to corporate was good, team was really helpful at all times. During BAU deliverables it will get hectic. Enough PPO opportunities.

Academic courses relevant to the project: Yes.



PS-II Station: Novartis Healthcare Pvt. Ltd., Hyderabad

Faculty

Name: Bharathi R

Student

Name: SANJAY SRIRAM (2017B2A80867G)

Student write-up

PS-II project title: Data and digital initiatives

Short summary of work done during PS-II: The projects which I have been involved in are part of the revolutionization within Novartis as an organization to move towards digitization. I helped all the associates who approached me in the digital revolutionization as I am one of the more technically equipped people in the movement. I have used my time to my absolute best so far at Novartis and would repeat it once if given the opportunity. The plan at Novartis is to adopt major digital innovations by 2025. So my being a part of this initiative has helped me develop my skills in digitalization as well as get an experience of working at a world renowned organization.

Tool used (Development tools - H/w, S/w): Power Apps, Sharepoint, Power Automate, Python Dash.

Objectives of the project: Develop applications to help reduce time and manual labor.

Major learning outcomes: Power Apps, Sharepoint, Power Automate, Python Dash.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Great and free work culture. Expected to communicate with many people and maintain good timelines while working. Not a very difficult PS station if you work according to timelines. Great place to learn new stuff and get a grip of the corporate world without stressing too much.

Academic courses relevant to the project: NA

PS-II Station: Nutanix Technologies India Pvt. Ltd., Bengaluru

Faculty

Name: Chandra Shekar R K

Student

Name: ONKAR KISHOR MATHEKAR (2017B2AA0838G)

Student write-up

PS-II project title: Deprecation of PyErgon

Short summary of work done during PS-II: I started out by migrating the remaining portions of PyErgon to GoErgon such as the background threads and the Command Line Interface. The CLI would be started in Python as a new service which would be bare bones version of the already

existing PyErgon service. But we we found out that it ended up taking a lot more memory than required, so I also scoped out the feasibility of moving the CLI to Golang. I also worked on the Upgrade scenario where PyErgon would hand off all the responsibilities it handles to GoErgon now. It would be carried out in a rolling fashion and I had to ensure that no node went down after the upgrade and the customer clusters were not affected because of this upgrade.

Tool used (Development tools - H/w, S/w): Go, Python, C++, Nutanix Clusters, Git, Sourcegraph, Bash Scripting.

Objectives of the project: Deprecate the existing PyErgon service on the CVM in favour of GoErgon.

Major learning outcomes: I learnt how to develop a service on the existing tech stack which has to run along with multiple other services with limited resources on the Cluster. I also learnt how to deprecate an older service to start the newer service on customer clusters while making sure no node goes down during the upgrade and no data is lost.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is really nice, with my manager and mentor constantly helping me out in all matters. I worked 8-9 hours on average everyday. My team members made sure I was not overburdened and that I took some time for myself.

Academic courses relevant to the project: OS, DSA, DBMS.

Name: PIYUSH PHATAK (2017B3A70425H)

Student write-up

PS-II project title: DynamoDB Adapter For ChakrDB

Short summary of work done during PS-II: I was working on a database called ChakrDB developed by Nutanix. My work was to create an adapter which can make ChakrDB compatible with DynamoDB APIs. Since it was an exploratory and open-ended project, I developed a basic framework for it and supported few basic DynamoDB APIs.

Tool used (Development tools - H/w, S/w): Linux, C++, DynamoDB, Git, Gerrit, MakeFiles, VSCode, Python, Sourcegraph.

Objectives of the project: To integrate DynamoDB with in-house database.

Major learning outcomes: Advanced C++, Object Oriented Programming, System Design, Nutanix specific C++ libraries, DynamoDB, Concepts related to Databases, Understood importance of writing clean code, debugging and code reviewing.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work Environment is great at Nutanix, interns are expected and encouraged to learn as much as possible. Everyone very helpful and approachable here. Working hours are also very flexible. I was expected to take full ownership of implementation of my project.

Academic courses relevant to the project: OOPs, DBMS, Computer Networks, OS, DSA, Compilers Construction.

Name: HARSHIT SHAH (2017B3A70557G)

Student write-up

PS-II project title: AHV Analyzer Tool

Short summary of work done during PS-II: My team was DevEx and within DevEx I was a part of AHV team. My main project related to AHV (Nutanix's own hypervisor) was to develop a python

script which analyze the workflows eg. AHV upgrade, VM migrate, VM CRUD operations etc. and check if it is successful or not by comparing the printed logs with the milestone logs and if the workflow is not successful then show the step on which it failed and show the remedy steps. Panacea is the project name for Log Analyzer developed by the DevEx team for log analysis/correlation. I have also worked on adding some signatures for AHV related panacea ENGs. Apart from this I was a part of other projects/tasks like Panacea CLI 2.0 (NH 8 Hackathon), to change VCPUs assigned to CVMs using the rolling reboot framework (U Hack Hackathon) and disk failure prediction.

Tool used (Development tools - H/w, S/w): Python, Shell Scripting, JSON, Nutanix Cluster, AHV, VS Code Editor, Vim, Gerrit, Git, JIRA, Confluence.

Objectives of the project: AHV Analyzer Tool project is aimed to make a generic workflow analyzer tool which could compare the milestones of a workflow to the actual logs printed and check if there is a failure at any step.

Major learning outcomes: The internship helped me in learning about the Nutanix architecture. It also helped me to learn to write clean and industry standard code and also improve my communication skills.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: It was really a great learning experience working at Nutanix. My managers and mentors have been really supportive throughout the internship and helped me whenever I got stuck. Bootcamp sessions were organised at the start of the internship to provide high level overview of Nutanix architecture. Several team building activities and hackathons were conducted for the interns. Overall the working environment was really great and I enjoyed working on the projects and other tasks I was allotted.

Academic courses relevant to the project: Several academic courses were relevant to the project eg. Operating System, Compiler Construction, Data Structures and Algorithms, Object Oriented Programming, Artificial Intelligence etc.

Name: RAHUL R SHEVADE (2017B3A70878H)

Student write-up

PS-II project title: Migrating Xi Regression to JITA

Short summary of work done during PS-II: Created resources required for running Xi (Nutanix's cloud) tests - network controller, load balancer, router, VMs to run tests on etc and paired them. Earlier tests were run on Jenkins using dedicated machines. Hence, tests had hardcoded values for subnet creation, VPNs, etc. We wanted to shift this to JITA which allows us to use pre-deployed or automatically deploy resources (through Nutanix's resource deployment manager, RDM). This would allow users to skip the tedious process of creating the resources from scratch. Out of 850 test cases that were run, 400 needed their configs changed. Next, scripts that were run during RDM deployment had to be changed to pair the resources required. Static resources were picked up from a database. Out of multiple sets of these resources (created beforehand), the free ones would be picked up. This would allow for easy and dynamic testbed deployment.

Tool used (Development tools - H/w, S/w): Python, Bash, Jenkins, Git, company software for testing and resource deployment.

Objectives of the project: To move running of Xi tests over to JITA, a test automation framework.

Major learning outcomes: Bash scripting, various workflows involved in testing, creating test sets, deploying resources, creating VMs.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment was good. People were nice and friendly. However, they do expect you to learn quick and you must be prepared to learn a lot by yourself. Timings were flexible. Overall, I had a decent experience.

Academic courses relevant to the project: Computer Networks, Operating System.

Name: PARTH KRISHNA SHARMA (2017B3A70907H)

Student write-up

PS-II project title: Critical case notifier revamp

Short summary of work done during PS-II: Revamp the critical case notifier application to fix all its bugs and issues. Add certain important functionalities to improve the usage and efficiency.

Tool used (Development tools - H/w, S/w): Vscode, Github, Npm Modules, Vm, Mongo Db, Javascript, Node.

Objectives of the project: Revamp the critical case notifier application.

Major learning outcomes: Javascript, Node, Mongo, Slack App and Bots.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Very nice and helpful environment. everyone is supportive and helps you to learn, guides you well, gives time to learn things. No pressure to finish any tasks, ample time is given to complete tasks, we can work whenever we want to. everyone is ready to help you out in case you are stuck. 10/10 experience and learning.

Academic courses relevant to the project: NONE

Name: VITTHAL P YELLAMBALSE (2017B4A70454G)

Student write-up

PS-II project title: Improving NDB

Short summary of work done during PS-II: Bug Fixes: Resolved some regressions from previous releases. Enhancing Existing Features: Allow users to provision standby machines from their previously provisioned primary instances. PoC Work: Involved in an effort to intelligently scale out a RAC database.

Tool used (Development tools - H/w, S/w): Ansible, Python, Jinja2 and shell.

Objectives of the project: Worked as a developer for the Oracle Team of the NDB product.

Major learning outcomes: This internship has provided me with a tremendous opportunity to hone both my technical and non-technical skills. I learnt about how to write production quality code while becoming well-versed with various tools and services. Finally, it has taught me how to solve numerous challenging problems.

Details of papers / patents: Not Applicable.

Brief description of working environment, expectations from the company: Expectations involve taking complete ownership of the tasks given in terms of bug fixes, feature enhancements, development of new features. Also, expected to participate in meetings and stand-ups.

Academic courses relevant to the project: Computer Programming, Computer Networks, OS and DBMS.

Name: VINAYAK SHUKLA (2017B4A70465G)

Student write-up

PS-II project title: Regression Scheduler Enhancements

Short summary of work done during PS-II: We containerized the scheduler code, introduced a menu based UI via Jenkins and managed a MongoDB server for communication between the

Jenkins job and the Scheduler. Also incorporated a rerun capability to the Scheduler to free up developer's time and energy for more productive endeavors.

Tool used (Development tools - H/w, S/w): Code was written entirely in Python. Learned and implemented concepts like Containerization via Dockers, CI/CD via Jenkins, DBMS systems like MongoDB.

Objectives of the project: The project revolved around improving the usability of the in-house Scheduler, which was cumbersome to use and manage.

Major learning outcomes: Learnt about the industry-level practices and industry level expectations. Learnt about the collaborative environment and the code review processes. Also learnt the importance of documenting and communicating before diving into implementation. Overall, the experience made me a better developer and a better person.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was very holistic and the expectations from the company were inline with what you'd expect. Constant communication and work and you'd never feel overwhelmed or underwhelmed about the work you're doing.

Academic courses relevant to the project: DBMS, DSA, OOP and to some extent AI.

Name: PRATEEK D HIRANANDANI (2017B4A70578H)

Student write-up

PS-II project title: Improving Debugging and Serviceability Aspects of Disaster Recovery Snapshots Storage Solution

Short summary of work done during PS-II: The team I was assigned to was working on developing a Disaster Recovery & Backup solution which aims to protect user data by replicating and storing snapshots. It was one of the major projects in development at the time. My contribution to the project was to improve the debugging and serviceability aspects of the project. This involved working on creating debugging pages for each of the core modules of the project. The debugging pages of each module displays information and stats generated during the execution of the module. These stats help monitor the ops running within each module, assess the progression of these ops and find any bugs or abnormalities generated. In addition to the debugging pages, I was involved in creating command line interface commands for the project which would allow us to query information related to the project such as listing the data and metadata from the database and/or cloud stores. During the internship, I worked closely with both the Dev and QA teams to add stats and commands which would help make the process of debugging easier.

Tool used (Development tools - H/w, S/w): Linux, C++, CMake, Protobufs, Flatbuffers, Git, Gerrit, Python, Jira, Sourcegraph, Kubernetes.

Objectives of the project: To build and improve tools such as debugging pages and command line interface commands which help which display and fetch information and stats useful for monitoring progress and debugging.

Major learning outcomes: Improved understanding of advanced C++ concepts, importance of writing good quality code and significance of formatting and code reviewing, testing code using unit tests and scripts in deployed clusters, integrating software like CMake, Protobufs, Flatbuffers, collaborating and contributing as part of a team.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Nutanix has an excellent working environment. An intern is treated just like a full time employee and is expected to contribute and take ownership of the work they do. There are regular sync-ups with mentors and managers in addition to the scrum meets with the entire team to discuss progress. In addition, one can approach any colleague for help at anytime. Interns are given access to all design docs, codebases and other learning resources necessary for the project. Working hours are extremely flexible as well. It is a great place to learn and work.

Academic courses relevant to the project: OOPS, OS, DBMS, Computer Networks.

Name: RITIK NAWAL (2017B4A70886G)

Student write-up

PS-II project title: REST API Implementation

Short summary of work done during PS-II: The project involved implementation of RESTful APIs to expose required entities and attributes for internal use. As a part of the project, I have gone through the OAS(Open API Specification), company documentation to understand API standards, implemented HTTP API calls and tested the same using Postman.

Tool used (Development tools - H/w, S/w): Java, Maven, Git & Github, IntelliJ-CE IDE, Confluence, SourceGraph, Postman.

Objectives of the project: The objective of the project was implementing Web based REST APIs for internal consumption. The API specification was expected to follow OAS (Open API Specification) and have support for pagination, filtering and sorting.

Major learning outcomes: Problem solving and analytical skills were improved.

Learnt how to write clean and concise code for specific requirements.

Helped in developing interpersonal skills as well.

Familiarized with API development & testing using Postman.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work culture of the company is very good. Everyone in my team was very friendly and helpful. They were always available on slack for doubts. They provided constant support, motivation and guidance throughout my internship. As an intern I was treated like an employee since I was included in all

the team sync up meetings and activities. More focus was laid on understanding the API development process as a whole , rather than just the implementation.

Academic courses relevant to the project: Object Oriented Programming (OOP), Data Structures and Algorithms (DSA), Database management Systems (DBMS).

Name: ABHEESHT SHARMA (2017B4A71014G)

Student write-up

PS-II project title: Normalising OVS Commands and Automating Performance Tests

Short summary of work done during PS-II: Initially, the aim was to read blogs, etc. and learn about OVS-DPDK. After that, I was given a project, namely, normalising OVS commands. Here, I had to define wrapper classes which displayed information of DPDK interfaces (Linux commands do not handle DPDK interfaces, which is why these wrappers are required). Secondly, there was a requirement to benchmark performance of OVS-DPDK and we needed a performance testing infrastructure, and this is what I principally worked on in the past 5 months or so.

Tool used (Development tools - H/w, S/w): S/W: Linux net-tools, OVS commands, OVS-DPDK, Python 3, Bash Scripting, Git, Prism UI. H/W: AHV.

Objectives of the project: 1. Define wrappers for Linux commands for DPDK interfaces 2. Writing automation scripts to compute the throughput using various traffic generators.

Major learning outcomes: - Learnt about OVS and OVS-DPDK, which is an enhancement of the OVS.

- Learnt to work in a team.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Everyone in my team is very helpful and always eager to assist. I've had a great time at Nutanix!

Academic courses relevant to the project: Computer Networks, Operating Systems, Object Oriented Programming.

Name: DISHIKA RASTOGI (2017B4AA1678H)

Student write-up

PS-II project title: Authorization and Authentication Services

Short summary of work done during PS-II: I worked on migrating the already existing stack of APIs to a new format which is more consistent and efficient and also support new functionalities such as filtering, sorting and concurrency control.. That includes writing the API models and their handler development. Also, worked on fixing various bugs across the two services. Collaborated with members from my team in adding new features to the services as well.

Tool used (Development tools - H/w, S/w): Golang, Python, PostgreSQL, Postman, Git.

Objectives of the project: Work on migrating the authorize APIs to the v4 format which removes the bottleneck in performance. Also fixing bugs and adding new features across the two services.

Major learning outcomes: For my project I worked on migrating the already existing stack of APIs. Participated in two hackathons across my internship period and worked and collaborated with different teams for the projects. Collaborated with different members within my team to add new features to the services and to fix bugs.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment in the company is quite chill and nice. My mentor, manager and other team members

have been very supportive and helpful during the whole internship. We constantly have fun meetings, tech talks, and KT sessions such that we are aware of all the projects our team is working on.

Academic courses relevant to the project: Computer Programming, DSA, Operating Systems.

Name: DHEER MANISH JAIN (2017B5A70573G)

Student write-up

PS-II project title: SaaS Application Management

Short summary of work done during PS-II: I interned with the Support Portal team, which is a part of the SaaS Engineering Organization. I got the opportunity to work to three different applications owned by the team: A) The Support Portal B) Invisible Release Manager (IRM) C) Elevate Portal. For the support portal, the most important projects that I have contributed to are : A) Case Creation using Clusters B) NGT Compatibility Matrix Enhancement. For the IRM, I cleaned up the release posting UI for making the release posting process simpler and less complex. Also, I added lots of automation to make the release posting completely configurable. For the elevate portal, I worked on some crucial security issue tickets those were reported by pentesting.

Tool used (Development tools - H/w, S/w): Javascript, Reactjs, NodeJs, SailsJs, MongoDB, Postgresql, JQuery, HTML, CSS, Git.

Objectives of the project: Work on JIRA tickets that are assigned in sprints. The tickets broadly cover bug fixes, Implementation of UI for crucial pages on the Nutanix Support Portal Application, Enhancing the UI of existing pages of the Portal.

Major learning outcomes: The major learning outcomes include: 1) Working on a codebase which has a live customer base and huge impact 2) Working in collaborative environment and interacting with senior engineers 3) Learning trending technologies and skills.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working culture of the company is really nice. Managers are very supportive. All the team mates are very helpful and approachable. The interns are given complete ownership of tasks. They get an opportunity to communicate with people from other teams regarding cross-team projects. Social connect events are conducted to improve team bonding.

Academic courses relevant to the project: Data Structures and Algorithms, OOP, DBMS.

Name: MANTRI RAUNAK RAMESH (2017B5A71340H)

Student write-up

PS-II project title: 1. Design K-means clustering based model for classifying fatal messages 2. Dynamically inject configuration change events into Consumer Service consisting of Lambda functions 3. Working on Spark Batch Jobs using Scala

Short summary of work done during PS-II: For the classification of fatal log messages, a k-means clustering model was proposed using a TF-IDF based vectorizer to vectorize the raw messages as an input to the ML model. A dataset of around 5000 messages was initially used. As a result, we could achieve a highly accurate classification with around 330 buckets. While injecting dynamic changes into consumer service, a significant learning involved working with Amazon Web services, docker, and understanding the concept of cold restarts for lambda functions. The project also involved exploring industry practices to migrate from python version 2.0 to 3.0. The project also enabled to get hands-on experience working with Apache spark batch jobs infrastructure.

Tool used (Development tools - H/w, S/w): Kubernetes, Amazon Web services(Lambda, Kinesis, Sagemaker, EKS), Golang, Machine Learning.

Objectives of the project: The project aims to develop an unsupervised learning based machine learning model to classify fatal log messages which can help further in diagnostics and proactive alerting. The project also aims to inject dynamic changes made into application configuration.

Major learning outcomes: I learnt several new technologies and have hands-on experience during the internship. These include Big data technologies like Apache Spark (particularly Spark ML Lib), AWS services, and Machine Learning applications in the industry. Significant learning outcomes also included working with Kubernetes SDKs and networking APIs and Docker.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment is healthy and interactive, with great learning opportunities. All the team members are very reachable. Your work generally goes into production, which gives you an incentive to work up to the mark. One is expected to be punctual enough for meetings and seek help instead of getting stuck on some bug for a long time.

Academic courses relevant to the project: Computer Networks, Object Oriented Programming.

Name: ABHISHEK CHINMAYA PATWARDHAN (2017B5AA1033G)

Student write-up

PS-II project title: Web development at CALM

Short summary of work done during PS-II: Worked with the team on delivering existing projects by making feature development and doing bug fixes.

Tool used (Development tools - H/w, S/w): JavaScript, HTML, CSS, node, yarn, React framework, Python, Github, Phabricator, VS code.

Objectives of the project: Helped the team in delivering crucial projects and also contributed in optimising certain procedures related to front end development.

Major learning outcomes: Technical learnings, Team work, Collaboration, Contributing to Industry level code base.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Highly collaborative working environment , providing great learning opportunities and scope to explore new technologies, while also providing responsibilities of delivering crucial tasks.

Academic courses relevant to the project: Computer Programming, OOP.

Name: SPARSH AGGARWAL (2018A3PS0303P)

Student write-up

PS-II project title: Capacity Planner and Authentication

Short summary of work done during PS-II: I worked on two main projects in Nutanix. The first one was to add a authentication mechanism to one of the Nutanix Services. I did this using the concept of OAuth and JWT. My Second Project was to built a Capacity Planner which is a tool to monitor various Azure Resources. I built this application using the FastAPI's and ReactJS. Apart from the two projects, I worked on a few JIRA tickets as well.

Tool used (Development tools - H/w, S/w): Docker, K8's, Python, FastAPI's, Django, Coralogix, AWS Athena, Mongo, Azure, GitHub, Gerrit.

Objectives of the project: I worked on two projects: 1) Building a capacity planner 2) Implementing authentication system for one of the Nutanix services.

Major learning outcomes: SDLC, Teamwork, Various Different Tools/Framework like FastAPI, Django, Python, GIT etc.,

Details of papers / patents: NA

Brief description of working environment, expectations from the company: I found the working environment at the company was very good.

Academic courses relevant to the project: OOPS, Networking.

Name: SHUBH PRAGNESH SHAH (2018A7PS0092G)

Student write-up

PS-II project title: QoS Layer for Zookeeper

Short summary of work done during PS-II: The first month involved learning about distributed systems and storage. Thereafter I worked mainly on the in-house fork of ZooKeeper, its monitoring software and clients. The work is very involved with CS fundamentals. A week after this was fixing a few tests so that I would get comfortable with the codebase. Then we introduced a tool to monitor clients and their request rates. After this, we introduced the QoS layer by implementing a throttler based on token buckets. The last month involved fixing the build system for ZooKeeper to fix many failing tests and to allow monitoring them using an internal tool. It also involved fixing a few bugs and tests. Most of the work was in Java and C++, some in Python and Golang.

Tool used (Development tools - H/w, S/w): Java, C++, Ant, CMake, JUnit, Python, Golang.

Objectives of the project: Introduce a Quality of Service layer for zookeeper to control rate of requests serviced per client.

Major learning outcomes: Distributed Systems, Consensus Algorithms, Java, CMake.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Great working environment, exceptional colleagues with great experience. Flexible work hours, minimal catch ups, allow you to work independently and have good ownership of the project. The culture is very open and people are friendly and helpful. No hard deadlines as such, real world projects and you can see the impact on the product.

Academic courses relevant to the project: Operating Systems, Object Oriented Programming, Data Storage Technologies and Networks, Data Structures and Algorithms.

Name: SHETTY KARAN KAVITA (2018A7PS0111G)

Student write-up

PS-II project title: A mock service that checks if the data replicated in LTSS is correct and Writing Castor Test UTs

Short summary of work done during PS-II: Made a test server, which replicates the data locally and tests if the steps were correct. Wrote UTs to bring up a service to manage volume groups.

Tool used (Development tools - H/w, S/w): C++ code, protobuf, git (gerrit), CMake.

Objectives of the project: Write a dummy module to short circuit and test the other side's capabilities and bottlenecks. Write UTs to test a new service and bring up local and remote site.

Major learning outcomes: Learnt how to write production level code, learnt a bit about the systems and storage types and how to handle them. Mostly C++ code and modularity along with function pointers.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good working environment, people are really helpful. They cater to the doubts really well and mentor well.

Academic courses relevant to the project: OS, OOP, DSA, CN.

Name: MANAS MINNOOR (2018A7PS0142G)

Student write-up

PS-II project title: Search Service Containerization

Short summary of work done during PS-II: The components of the service were rewritten to use cloud-ready APIs. Some of the APIs were also modified to avoid direct querying of databases. Queries were written in PromQL for timeseries data as well.

Tool used (Development tools - H/w, S/w): Git, Gerrit, GoLang, Java, JMC, PromQL, Victoria Metrics, Postman.

Objectives of the project: To containerize the search service of AiOps team to migrate to a cloud-hybrid workflow.

Major learning outcomes: Learnt how to write production-level code along with unit tests. Also learnt how to collaborate on large codebases. Learnt the usage of many software frameworks and tools used in the industry.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is collaborative, well-balanced and encouraging. Supportive managers and teammates leads to fast growth and overall success. Good work-life balance as well.

Academic courses relevant to the project: None were very relevant.

Name: YASH RAJ SINGH (2018A7PS0214P)

Student write-up

PS-II project title: Improving Efficiency of Storage Devices

Short summary of work done during PS-II: Made changes in the codebase to integrate the newer `io_uring` library for asynchronous IO operations. This involved understanding the functionalities provided by the `libaio` library and provide the same by leveraging `io_uring` library.

Tool used (Development tools - H/w, S/w): Gerrit, Nutanix Internal Tools.

Objectives of the project: Storage devices capable of sub 10μsec latencies have made the software interface running them truly show its age. To leverage the lower latencies and high IOPS of these physical devices, continuous improvement is being done in the IO API space.

Major learning outcomes: Was able to enhance my knowledge of C++, and learn more about system programming.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Team members were very helpful, friendly and supportive. The work environment was collaborative, fun and challenging. People were available and were ready to solve any doubts or questions I had.

Academic courses relevant to the project: Operating Systems, C programming, Data Structures and Applications.

Name: CHIRAG C D (2018A7PS0277P)

Student write-up

PS-II project title: S3 Interface for File Server

Short summary of work done during PS-II: Nutanix Files is a remote file server and storage solution that can be mounted through NFS or SMB. My project was to extend this to enable users to access files through the S3 protocol. Additionally, I worked on improving the garbage collection for Files' long term storage / archive component.

Tool used (Development tools - H/w, S/w): C/C++, Python, Golang.

Objectives of the project: Add S3 access to Nutanix Files; Upgrade Garbage Collection for Files Backup.

Major learning outcomes: Distributed storage, performance-oriented programming, Golang.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is very open and friendly, help is easy to ask for if needed. Objectives are stated fairly clearly, interns are pointed to and given access to resources required. Nutanix works on multiple aspects of software for clusters that together form what is almost an OS for a cluster. I expected and was given an interesting project in core-CS, specifically in systems.

Academic courses relevant to the project: Operating Systems, Computer Networks. Network Programming and Cloud Computing are great to have.

Name: ROHAN KUMAR (2018A7PS1013G)

Student write-up

PS-II project title: Container image scanning tool for registry

Short summary of work done during PS-II: Developed a container scanning feature for nutanix registry in golang. Used open source tool Clair for scanning images.

Tool used (Development tools - H/w, S/w): Kubernetes, Docker, Golang.

Objectives of the project: Develop a vulnerability scanning tool for images stored in the Nutanix container registry.

Major learning outcomes: Distributed Computing

Details of papers / patents: None

Brief description of working environment, expectations from the company: Fast paced company. Office was very fun to go to.

Academic courses relevant to the project: Cloud Computing

Name: ANUJ YADAV (2018A8PS0029P)

Student write-up

PS-II project title: Assets summary: Flexibility and performance improvement

Short summary of work done during PS-II: In the beginning, for a couple of weeks the work was majorly to explore the codebase and make some changes, and get familiar with how the things are working. After that, the project was assigned, which was to improve the performance of Assets Summary Dashboard & add dynamic support for all types of accounts on the Dashboard (previously it needed hardcoding to add support for a new type of account). The project involved, changes required both in the Frontend and the Backend side (as I asked to get a full-stack developer experience). I wrote the BE code in GO Lang & Python, and the FE code in ReactJS. Apart from the main project, I worked upon solving several Bugs, and JIRA tickets, which helped

me in gaining experience of how an FTE works, and also helped me in understanding the workflows of FE and BE tickets / tasks.

Tool used (Development tools - H/w, S/w): GO Lang, POSTGRESQL, MongoDB, Python, ReactJS, Git, Gerrit, DBeaver, POSTMAN, Robo3T, etc.

Objectives of the project: 1. To increase the performance of the Assets Summary Dashboard (a Nutanix Product); 2. To add dynamic support to all types of accounts, omitting the need to hard code the support for a new account type for the Dashboard.

Major learning outcomes: The project provided a wide scope for learning different tools and technologies, for Example: GO Lang, POSTGRESQL, MongoDB, Python, ReactJS, API Handling, Git, Gerrit, DBeaver, POSTMAN, Robo3T, etc. Apart from that, the JIRA tickets assigned (both containing the code changes from Frontend and Backend codebases) helped me in getting the experience of how a Full-Stack Developer works. The independent project helped me learn new tools & technologies and the JIRA tickets helped me learn how to work in a team at the corporate level, and how to write industry level & efficient code.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The main focus during the internship was not only on completing the tasks assigned but the things you learned while solving those tasks. My mentors and manager always helped me whenever I got stuck and gave me the right directions to move forward. Also, everyone at Nutanix (whether they belonged to my team or some other team) is very helpful in solving all your doubts. In the end, I would say, every Nutanix lives by the company's motto, i.e. being "Hungry, Humble & Honest with Heart" and demands the same from the interns.

Academic courses relevant to the project: OOP, DSA, DBS, Computer Programming.

Name: ARSHDEEP SINGH (2018AAPS0436H)

Student write-up

PS-II project title: Migration of Objects

Short summary of work done during PS-II: For the first few months, I studied about Objects, Object Stores and various Object Store solutions. I also looked into their offerings and existing solutions to migrate Objects to and fro our platform. I documented everything in detail and presented the same to the team. Since a solution already existed, the team decided to not go with the project. Apart from that I worked in my team to work on bug fixes and features. Currently I am working on 2 features assigned to me.

Tool used (Development tools - H/w, S/w): Golang, docker, c++, swagger, Postman, grpc, bash scripting, powershell scripting, Linux CLI.

Objectives of the project: To check feasibility and existing solutions and work on integrating the same.

Major learning outcomes: 1. Good communication skills 2. Learnt to work as a team 3. Learnt how to work on huge codebases 4. Learnt to adapt to new codebases and languages.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment was quite pleasant. My team was very supportive and helped me every-time I was stuck. My mentor cleared all my doubts whenever I approached him. My expectations from the company were to allow me to work on complex problems and brainstorm on new ideas. The internship was a great learning experience and acted as a stepping stone for me into industry.

Academic courses relevant to the project: Data structures and algorithms, Object oriented programming, Computer networks.



Name: KARNAVAT TEJAL LALITKUMAR (2020H1030044G)

Student write-up

PS-II project title: DBServer Provisioning

Short summary of work done during PS-II: Work majorly involved PoCs, developing customer scripts, development of APIs for DBServer Provisioning, integration effort for provisioning, unit testing, integration testing in Kubernetes pods, rollback implementation, enhancements / modifications in existing flow.

Tool used (Development tools - H/w, S/w): Tools and technologies - Python, AWS, JIRA, Git, Confluence.

Objectives of the project: To enable provisioning of database / DB Server using public clouds (AWS currently) and ensure that it works both, on-prem and with cloud (AWS). My project involved developing parts specific to one team and interact and leverage code developed by other teams.

Major learning outcomes: Writing cleaner, reusable code, research and investigation, handling failures, collaboration with other teams, exposure to tools and technologies.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Working environment is flexible, expectations from company involve completion of tasks assigned.

Academic courses relevant to the project: Database Management, Cloud Computing.

Name: SURBHI SHARMA (2020H1030148H)

Student write-up

PS-II project title: Project 1 - Toolkit for Debugging, Project 2 - Cache warmup

Short summary of work done during PS-II: I got a chance to work on 2 projects. 1st project was a CLI app developed in python. The objective of tool was to parse large amount of logs available in different format and generate statistics on grafana for the same. Also enhance the user experience. The 2nd project was optimization problem, where I was supposed to implement a code logic, which could prevent data loss and also reduce access time for data in cache.

Tool used (Development tools - H/w, S/w): Python, CPP, docker, docker compose, grafana, jira, logCLI, mongoDB, timescale DB, loki, gerrit, github.

Objectives of the project: Toolkit of Debugging is a CLI tool based on python, Cache warmup project is more of memory and cache architecture used by Nutanix.

Major learning outcomes: Cloud concepts and docker.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was very nice. Team is very supportive and motivating all the time.

Academic courses relevant to the project: Yes.



PS-II Station: Nvidia Graphics - Hardware, Bengaluru

Faculty

Name: Shree Prasad Maruthi

Student

Name: SAMRUDDHI JAIN (2017B2A30255G)

Student write-up

PS-II project title: Memory Subsystem Unit Design and Verification

Short summary of work done during PS-II: The project involves the verification of one of the Memory Subsystem units that is used to arbitrate among clients, by using different types of simulations and setting up the coverage infrastructure on the new testbench by using perl script for parsing xls file and generating System Verilog coverage file. The objective is to make sure that the unit conforms to the functional specification. The goal to generate the coverage report in the new UVM testbench environment was achieved. Also, explored the different tests and testbench components required for the verification before the GPU goes for the tape out.

Tool used (Development tools - H/w, S/w): System Verilog, Linux shell programming, Perl scripting, Excel and UVM.

Objectives of the project: The aim of the project is to generate a coverage report which will help in debugging and ensuring that the module is robust enough to be synthesized.

Major learning outcomes: During this project, I have learned about the verification of one of the Memory Subsystem units that is used to arbitrate among clients, by using different types of simulations and setting up the coverage infrastructure on the new testbench.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was really very good. My manager, mentor and all the team members were very supportive and kept motivating me all the time. I really got to learn a lot.

Academic courses relevant to the project: Digital design, MuP and Computer programming.

Name: TADA LAHARI (2017B2A80424G)

Student write-up

PS-II project title: Post silicon validation of spread spectrum clocking and a study of frequency monitoring circuitry on SoCs and GPUs

Short summary of work done during PS-II: First half of the project included developing scripts using Python that would support running hardware related software in parallel to generate the required results, these results were both quantitatively and qualitatively analysed. The next part of the project was focused on understanding frequency monitoring circuitry specific to chips produced by NVIDIA and developing models on system that could estimate their functioning; this model can help reduce the testing time and also does not require on chip data collection.

Tool used (Development tools - H/w, S/w): Python for scripting, several other hardware tools internal to the company.

Objectives of the project: The main objective of the project is to automate the characterization of spread spectrum clocking on a SoC and analysing the results obtained, followed by a detailed study of frequency monitoring circuitry on GPUs and also developing theoretical methods.

Major learning outcomes: Understood why spread spectrum clocking is important in digital circuits and why we monitor frequencies of certain critical clocks to ensure smooth communication and operation of different IPs on a chip.

Details of papers / patents: None

Brief description of working environment, expectations from the company: NVIDIA is the best place to begin your career as a hardware engineer, be it any team, you are expected to know your fundamentals well. Honest and sincere efforts are always rewarded. People are quite friendly and very well approachable too.

Academic courses relevant to the project: Electronic devices, Microelectronic circuits, Digital design, Microprocessors and Interfacing.

Name: ANMOL KALANTRI (2017B2AA1494H)

Student write-up

PS-II project title: Design & Analysis of Preroutes in Physical Design

Short summary of work done during PS-II: Working in collaboration with Physical Design Methodology team, our goal was to run trials and test the initial builds for the custom prerouter. Primary task was to report the DRC violations, congestion, Non-uniform track utilization of nets and review overall routing of NDR (Non-default rule) nets.

Tool used (Development tools - H/w, S/w): NVIDIA Proprietary tools.

Objectives of the project: Preroute is one of the initial steps in Physical Design cycle, wherein high priority nets, such as Clk nets (occasionally integral data nets also) are routed before the placement of standard cells.

Major learning outcomes: Clock routing in advanced nodes, Sequential ASIC designs.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Overall working environment of the organization is enjoyable. Working with cross-functional teams here gives us a chance to learn from collaboration and experience. Colleagues are quite eager to help, but expect deliverables to be completed within timelines.

Academic courses relevant to the project: Digital design, STA, VLSI design.

Name: AASTHA DAVE (2017B3AA0959H)

Student write-up

PS-II project title: Clock controllability and Clocking Design of Tegra System-on-Chip

Short summary of work done during PS-II: As the owner for clock controllability checks for a chip project in the Autonomous Vehicle SoC market, I implemented static checks to validate hardware designs and ensure that flop clock ports are controllable at the chip level. I identified routine tasks which generally take up a designer's time and automated them by writing Perl scripts. I also executed clocking design updates per a new chip architecture for three new chip projects. It involved an understanding of verilog elements, building verilog, partitioning macros, understanding clock usages, establishing physical and logical connections.

Tool used (Development tools - H/w, S/w): Primarily, I used several NVIDIA proprietary tools for clock controllability checking and design aware netlist creation tools. Other tools include Synopsis Verdi for RTL debugs.

Objectives of the project: 1. To perform clock controllability check, a crucial pre requisite to DFT testing 2. To automate routine tasks with Perl scripting 3. To execute clocking design updates as per the new chip architectures.

Major learning outcomes: 1. Understanding of various DFT modes 2. Understanding of clocks design flow and clocking architecture 3. Understanding of Perl for automation.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Great working culture, respect for team members and their working styles/times. As an intern, they expect you to be participative, in terms of coordinating with and assisting other teams and of course attending meetings set out for you. Manager and mentor were available and helpful, so were most other teammates do team up and participate in the next NTern Tech Tank, based out of the Shark Tank Show. It'll be an amazing experience).

Academic courses relevant to the project: Digital design, Analog & digital VLSI design, C programming.

Name: PRABHU LAWANDE NIHAL HARISH (2017B4AA0845G)

Student write-up

PS-II project title: Automation of Formal Verification Setup for SoC

Short summary of work done during PS-II: I was part of SoC backbone team which handles all the network on chips. My internship was on automating the formal verification technique used for checking interface compliance for different components on SoC. The idea behind the project was to develop a script that can take Backbone design files and interface protocol files and generate the FV environment for the design under test (flavor). After this project, I also worked on debugging the system verilog assertions which had failed in the design. Also I worked on writing performance checkers for the backbone design such as Bubble performance checkers, throttle checkers, etc. This project will be very effective and will reduce a lot of time which was required to bring up FV environment for backbone SoC. I got to learn about different interface protocols and network on System on Chips. Also got to learn and implement Formal verification technique for verifying design components.

Tool used (Development tools - H/w, S/w): JasperGold tool, VNC remote PC, Perl, Python, system verilog, vim editor.

Objectives of the project: Automating the formal verification setup for all the flavors inside SoC backbone so that any changes in the design or flow will be directly implemented and no manual changes required from the user.

Major learning outcomes: AXI3, AXI4, APB interface protocols, System on Chip and network on chip designs, Formal Verification methodology, Perl, System Verilog Assertions, and Python scripting.

Details of papers / patents: No papers were published.

Brief description of working environment, expectations from the company: The internship was work-from-home for me but the working environment was fantastic. Team members were really helpful in guiding me whenever I had a doubt through teams calls. Regular interactions with mentors and monthly reviews with the manager kept me updated about my progress. Regular weekly team meetings also kept me updated about the overall project flow and timelines expected. In the starting phase of the internship, they give enough resources and time to ramp up or learn new things. One thing which is very important is communication and asking doubts whenever you are stuck on anything. But overall, they give a warm welcome and the Nvidia HR team also organizes a few interactions and team bonding activities which is great as one can meet other interns there.

Academic courses relevant to the project: Computer Architecture, Digital Design, Analog and Digital VLSI Design, Data Structures and Algorithms.

Name: ABHINANDAN SHARMA (2018A3PS0095P)

Student write-up

PS-II project title: GPE Tool Enhancements for Efficient Tegra Chip Power Analysis

Short summary of work done during PS-II: Contributed in the ongoing GPE (General Power Estimator) tool development process. Added new features to the Python based tool for efficient power analysis of Tegra Chips. The updated version with the new features got released during my internship period itself. Later I used the tool to perform power analysis on a video chip in making. The end goal of this analysis was to optimize the power-performance relation by generating estimates for different configurations of the chip.

Tool used (Development tools - H/w, S/w): Python based GPE tool, MS excel, Perforce.

Objectives of the project: Contribute in the development process of the Python based General Power Estimator tool and then exploit the tool to perform power analysis for Tegra chips.

Major learning outcomes: Concepts of power estimation, power analysis techniques, Python automation.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: People are supportive and upfront in helping and explaining concepts.

Academic courses relevant to the project: ADVD, MuE, Optimization.

Name: KESHAV GOYAL (2018A3PS0317G)

Student write-up

PS-II project title: DBB ordering, Scaling and Automation in Memory Sub-System

Short summary of work done during PS-II: The first project was to right the checker for an IP that works on AXI Protocol. The AXI protocol allows out-of-order transactions but the IP needed to maintain ordering. The checker used the AXID to keep track of the order by inserting them in a FIFO. And popping them to check for the order during the response. The 2nd project was to scale the TB so that the same code can be used for multiple project without manual changes. This was done by using perl to print the code which needs to change between projects with the change info present in some spec files. The automation project was to detect a failure using the logs and send an email regarding the same. A perl script reads all the log files required and check for the failure and send the email.

Tool used (Development tools - H/w, S/w): System Verilog, Perl, Perforce.

Objectives of the project: Writing a check to verify response ordering by an IP, Scaling existing TB code and Writing PERL script to check the log files and send email accordingly.

Major learning outcomes: How to access a problem visualize the solution and implement it in an efficient way. Learnt a lot about verification.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work environment is relaxed and the mentors and managers are easy to approach.

Academic courses relevant to the project: Digital Design (Verilog), Embedded System Design (AXI Protocol), OOPS ,Computer Architecture.

Name: RAHUL AJMERIA (2018A3PS0329H)

Student write-up

PS-II project title: ASIC PD Intern for tegra chips

Short summary of work done during PS-II: Nvidia Confidential.

Tool used (Development tools - H/w, S/w): Unix, Perl scripting, Python, Excel.

Objectives of the project: Physical design of chip.

Major learning outcomes: Physical design of chip.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Beautiful working environment, the company trusts me to be accountable and responsible for my work

which brings out a style of working at one's own pace and way, this is something very unique I experienced.

Academic courses relevant to the project: Digital design, Computer architecture, ADVD.

Name: KHAN UBAID MD SHAFIQR REHMAN (2018A3PS0541H)

Student write-up

PS-II project title: Implementation and Advantages of Dynamic UVM Register Model

Short summary of work done during PS-II: The verification of designs involves building up the complete verification environment. The designs have a vast number of control and configuration registers. A large build time is spent compiling the entire register model, which has a large number of classes, causing large simulation time. The idea is to create this register model dynamically which will be created at the run time. This helps bring down the build time and improve performance.

Tool used (Development tools - H/w, S/w): Python, SystemVerilog, UVM, VCS, Verdi, Unix, Perforce.

Objectives of the project: The objective of the project was to reduce the simulation time of test-benches.

Major learning outcomes: Learnt in detail about the Register Layer in Universal Verification Methodology. Learnt about how a unit test-bench works. Gained hands on experience in SystemVerilog, UVM and UVM Register Layer implementation.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The people at Nvidia are friendly and very helpful. The work environment is very supportive. It is expected that the work be done on time, and also expect certain level of independence post the ramp-up period.

Academic courses relevant to the project: Computer architecture, Microprocessors.

Name: ASHWIN E (2018A3PS0554H)

Student write-up

PS-II project title: Peripheral Component Interconnect Express - Transaction Layer

Short summary of work done during PS-II: Enhanced a python script to provide support for special registers to automate part of the workflow. This enhancement auto generates parts of the Makefiles and system Verilog testbench files for easier handling of some special registers. Built a web version of Internal Logic Analyzer Tool from scratch. This tool is used for post-silicon debugging of chips, by triggering parts of the chip and storing results in PCIe registers. Also, did some work on logic synthesis step of the ASIC design flow. Synthesized PCIe top modules and debugged their timing issues (CDC issues) with the help of Meridian CDC tool. Also did some RTL coding to setup VDC between two power domains by passing the required signals through a splitfifo and level shifters. Was also responsible for netlist auditing and debugging of the PCIe Transaction layer top modules. Helped my team in solving some PCIe transaction layer bugs. Was part of weekly design meets to discuss the PCIe design plan for the next week.

Tool used (Development tools - H/w, S/w): Virtual Network Computing, Perforce, VSCode, Linux, PuTTY, Microsoft Azure, Meridian CDC, Synopsys Design Compiler, Synopsys IC Compiler II, Microsoft Office.

Objectives of the project: 1) Write a python script to automate a workflow, 2) Synthesize RTL code and debug Clock Domain Crossing errors, 3) Build an Internal Logic Analyzer from scratch, 4) Perform RTL coding for Voltage Domain Crossing and 5) Setup synthesis for different module

Major learning outcomes: 1) In depth knowledge of PCIe and its layers
2) Internal Logic Analyzer Basics, HTML/CSS and JavaScript Coding
3) In depth knowledge on ASIC design flow, logic synthesis and Clock/Voltage domain crossing
4) Improved Python coding abilities
5) Improved RTL coding abilities using Verilog and NVIDIA in-house HDL

Details of papers / patents: NA

Brief description of working environment, expectations from the company: My team was very friendly and helpful. All the team members were always ready to help and clear doubts. The work given to me was spaced out over the duration of 5 months and ample ramping up was done before the start of the projects. Each intern was assigned a mentor for the whole duration of the internship. Mentor serves as the first point of contact in case of doubts. There were weekly sync ups with the manager and biweekly intern sync ups where the interns exchanged knowledge. The project deadlines and expectations were reasonable.

Academic courses relevant to the project: Digital Design, Electronic Devices, Microprocessors and Interfacing, OOPS.

Name: ANSHUMAN BHAGAWATI (2018A3PS0610H)

Student write-up

PS-II project title: Physical Design Implementation of ASIC Block in FinFET Technology

Short summary of work done during PS-II: My work majorly involved working with two blocks: (A chip(I/C) is divided into smaller subsections called chiplets which is further divided into smaller blocks.) 1) Floorplanning of the first block keeping in mind the timing delays and the hierarchy of the different cells. 2) Take a block through all the placement and routing steps, report the violations in the timing, power etc. and try to fix them.

Tool used (Development tools - H/w, S/w): Cadence Innovus, Synopsys ICC2, Nvidia Internal Tools.

Objectives of the project: Take a block through all the placement and routing steps and achieve closure in timing, power after analysing the metrics.

Major learning outcomes: 1) Physical Design Flow 2) Placement and Routing tools 3) Analysis of metrics like timing, power, congestion, cell density etc.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work environment was pretty good. Manager and mentors were pretty supportive and very helpful. Initially, we had a ramp up of more than a month where we learnt about physical design basics. This ramp up period might vary between teams and learning required. The learning curve for the initial period was steep where we had to learn the basic concepts as well as the tools and flow used in Nvidia but there was enough space to ask questions and get doubts cleared by mentor. The work was not very hectic (this varies between teams) and there was enough time to revise some basic concepts if needed or take time to think through a problem.

Academic courses relevant to the project: Digital Design (including STA), Microelectronic Circuits, Basic MOS device concepts.

Name: SOMYA SAWLANI (2018AAPS0252G)

Student write-up

PS-II project title: Physical Design Implementation of ASIC block in FinFET Technology

Short summary of work done during PS-II: Aim was to do optimum placement and routing of ASIC block to achieve desired qor. Analysing the reports after the physical design flow and start other run to achieve good results.

Tool used (Development tools - H/w, S/w): Cadence Innovus, Synopsis ICC2 and Nvidia internal tools.

Objectives of the project: Physical design implementation of ASIC block from netlist to gds. To do the placement and routing of asic block and to analyse the quality of results to achieve desired quality.

Major learning outcomes: TCL scripting, Physical design flow, VLSI design flow, EDA tools like Innovus and ICC2, placement and routing in detail.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very good working environment. Anyone you ask for assistance from will be happy to do so.

Academic courses relevant to the project: ADVD, Electronic devices and basic coding.

Name: VAIBHAV AGRAWAL (2018AAPS0367G)

Student write-up

PS-II project title: SoC-level Timing Analysis of Automotive SoC

Short summary of work done during PS-II: Learnt the STA concepts, jargons and flows. Learn the STA tools: Synopsys PrimeTime and NVIDIA's internal timing tools. Automated some of the aspects of NVIDIA's timing workflow.

Tool used (Development tools - H/w, S/w): Synopsys PrimeTime, NVIDIA's internal timing tools, VNC Viewer, Perforce.

Objectives of the project: SoC timing convergence.

Major learning outcomes: Learnt the STA concepts, jargons and flows. Got an hands-on experience of industry standard timing tool: Synopsys PrimeTime. Learned to read and analyze the timing report manually and as well as through NVIDIA's internal timing tool.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Working environment is great. Flexible work hours because of WFH internship. If US team is involved in the project then there will be some meetings in the evening. Everyone is so supporting, you just need to ask for help.

Academic courses relevant to the project: Analog and Digital VLSI Design (STA part), Digital Design (STA part, if it is taught).

PS-II Station: Nvidia Graphics - Hardware, Hyderabad

Faculty

Name: Kranthi Kumar Palavalasa

Student

Name: PATNANA VENKATA SAI (2018AAPS0468G)

Student write-up

PS-II project title: CAD Tools Project

Short summary of work done during PS-II: Initially i was trained on a CAD Tool, and later i was asked to make enhancements to the tool. The work is pretty challenging. Liked the project and got learn about various domains.

Tool used (Development tools - H/w, S/w): Nothing in specific.

Objectives of the project: Made enhancements and fixed the bugs for a CAD tool.

Major learning outcomes: Coding skills.

Details of papers / patents: Nothing

Brief description of working environment, expectations from the company: The work environment is pretty good. Manager and mentor helped me in clearing my doubts.

Academic courses relevant to the project: Digital Design and coding skills in C++, tcl, python.



PS-II Station: Nvidia Graphics - Software, Hyderabad

Faculty

Name: Sanjay Vidhyadharan

Student

Name: SRISHTI SHARMA (2020H1030118H)

Student write-up

PS-II project title: Enhancing Devops Infrastrure

Short summary of work done during PS-II: Initially, I've been allotted task of capturing code related metrics across all repositories of the project and integrate the python script written for it into Jenkins. For this, I need to make use of Gitlab API and its REST APIs. Some other tasks involved fixing software defects using Coverity tool. So, basically I was instructed to work in the CI pipeline of DevOps in my team.

Tool used (Development tools - H/w, S/w): SW- Git, Gitlab API, Perforce, Coverity tool, Jenkins, pylint, JIRA.. HW- Linux VM with Ubuntu 20.04 LTS installed (CLI only).

Objectives of the project: My main work is to enhance SW-GPU team's DevOps infrasture by writing python scripts to integrate into Jenkins.

Major learning outcomes: The major learning outcomes comprised of the following:

- Getting hands-on Gitlab and Gitlab API.
- Learnt how to use Gitlab python-module to use Gitlab's available REST APIs for fetching responses from python scripts.
- Learnt Jenkins and its integration to run scripts in an automated manner.
- Got familiar with the Coverity Tool to understand the SW defects in order to remove them.
- Got familiar with some Server management protocols like PLDM, MCTP, SPDM etc.
- Also, learnt about BMC (Baseboard Management Controller) architecture.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Nvidia is indeed the best place to work. The culture here is fast-paced, challenging and can be quite overwhelming for interns. A software intern here is expected to be an Independent Contributor and should be a self-learner. This in a sense teaches a lot of thing and in turn aids to our knowledge. Mentors are assigned to the interns who can help them in times of need but we need to be specific with the doubts as the mentors are usually involved in higher priority tasks. The employee benefits along with compensation after PPO are great but one need to be the top performer to get PPO.

Academic courses relevant to the project: Computer Networks, OS, C++ programming.

PS-II Station: Nvidia Graphics -Software, Bengaluru

Faculty

Name: Sanjay Vidhyadharan

Student

Name: C SHEKHAR RANA (2020H1030115P)

Student write-up

PS-II project title: Test Case Recommendation and Prioritization

Short summary of work done during PS-II: Created three ML models of increasing complexity to accept bug-related information as input and output a list of recommended test cases (in decreasing order of relevance).

Tool used (Development tools - H/w, S/w): Python.

Objectives of the project: Create an ML based system to accept a bug description and return a ranked list of test scenarios that can be performed around the fix to avoid regressions.

Major Learning Outcomes: Machine learning, neural networks, Devops tools.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Excellent team. Highly cooperative and encouraging. They give me full creative freedom, actively helped me

bounce ideas, provided clear guidance and allowed me to benefit from their immense domain knowledge.

Academic courses relevant to the project: Data mining, advanced data mining, deep learning were the core of this project.

Name: HIMANSHU DHYANI (2020H1030119H)

Student write-up

PS-II project title: Addition of Cache Layer to Web App

Short summary of work done during PS-II: Work done by me was divided into 8 tasks-

Task1 was the evaluation of issues in the web app which were causing the performance bottleneck. I identified which APIs were creating the problem. Task2 was the evaluation of various cache solutions over Redis cache. I studied what are the other cache available in the market other than redis. Task3 was to set up redis cache server in Kubernetes. Task4 was to design and implement the redis cache layer. I implemented the utility file which was use to store, remove and invalidate the data in redis. Task5 was figuring out data needed to be cached. Task6 was to use eviction policy for redis cache. Task7 was to define invalidation logic. Task8 was to perform testing in developing, staging, production stage.

Tool used (Development tools - H/w, S/w): S/w tools- Hibernate, sqlyog, JPA, Redis, Kubernetes, Git, code collaborator.

Objectives of the project: Improve the performance of the web app by introducing cache layer.

Major learning outcomes: N-tier architecture in software development, understanding of Core Java, RDBMS, REST, ORM/Hibernate, Testing framework knowledge, Redis cache.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Working environment was friendly and cooperative. Seniors were always available for any help. Expectations from the company was availability of amicable working environment, learning opportunities, familiarization with corporate culture, better stress handling and better remuneration.

Academic courses relevant to the project: Computer Network, Database, Data Structure, Algorithm.

Name: UTKARSH PAREEK (2020H1400223H)

Student write-up

PS-II project title: Updating InfoROM command

Short summary of work done during PS-II: In starting i learnt about different tools used in NVIDIA and was setting up work environment. Then a task to write infoROM command was given to me. I learnt the code flow and how different files were connected. I later learnt how to build and flash the code. After getting working of code, my mentor then introduced me to an automation script. It was used to automate the task of erase, flash and dump command that has to be implemented on ROM. I studied that language and understood the working of code. The script was sending erase command but it was not implemented in the code. So I wrote erase command. Later, I found out that there was error in flash command. It was taking static data but script was sending dynamic data. So that also I corrected. I learnt debugging skills and how to collaborate on GIT. Here two codes are used i.e. IFW (Internal Firmware) and AFW (Aurix Firmware). I modified script to work for both IFW and AFW codes.

Tool used (Development tools - H/w, S/w): Tegra board, DaVinci Generator, Infinium mem tool, GIT, GERRIT, VNC viewer.

Objectives of the project: To implement new functionality in infoROM command.

Major learning outcomes: I learnt working on SPI. I learnt how to write shell command, how to collaborate on GIT and how debug the code using prints.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Working environment is good and supportive. All my queries were answered. Manager and mentor took timely meet and they properly explained to meet all the aspects of project.

Academic courses relevant to the project: Software for Embedded System, Device Drivers, Embedded System Design, Real Time System.

PS-II Station: NXP India Pvt Ltd., Bengaluru

Faculty

Name: Sanjay Vidhyadharan

Student

Name: AAKULA GANDHARVA KRISHNA (2020H1240082H)

Student write-up

PS-II project title: Ultra Wide Band - Radar

Short summary of work done during PS-II: My major work done during PS-II was in three particular phases, Phase - I, was based on the basic understanding of the UWB technology, its characteristics, background etc., Phase - II was the collection of data how to perform analysis, evaluation etc and Phase -III consisted of deeper aspects and concepts of UWB.

Tool used (Development tools - H/w, S/w): C Programming, Python, Matlab, Git , SVN etc.,

Objectives of the project: To understand the Ultra Wide Band technology, its standardization, characteristics and finally understand one of its use case of radar.

Major learning outcomes: Working of Radar, UWB technology PHY layer characteristics, Channel Modelling, Different concepts such as Angle of arrival etc.,

Details of papers / patents: None

Brief description of working environment, expectations from the company: Working environment was always motivated, colleagues were open to discussions and very helpful, a very drastic improvement in my learning curve, very good worklife balance, altogether expectations were good working attitude, efficient working skills, work ethics, consistency etc.,

Academic courses relevant to the project: Yes, majority of my M.E courses were relevant to my project study and internship.

Name: VUSTHILA SUDHEER REDDY (2020H1400179P)

Student write-up

PS-II project title: Functional Safety

Short summary of work done during PS-II: i worked with STCU block which is called as Self test control unit. It basically includes Logic BIST and Memory BIST. It verifies memories and registers before accessing the chip to ensure the chip is safe. we have to understand the module and run the testcases and we have to debug them.

Tool used (Development tools - H/w, S/w): VCS, VMANAGER, Verdi.

Objectives of the project: implementing safety mechanisms according to ISO26262.

Major learning outcomes: BIST

Details of papers / patents: None

Brief description of working environment, expectations from the company: working environment is good and they helps a lot in understanding concepts.

Academic courses relevant to the project: VTT, AMBA Protocols.

PS-II Station: NXP Semiconductors, Noida

Faculty

Name: Rajesh Kumar Tiwary

Student

Name: NISHIT SHARMA (2020H1230184G)

Student write-up

PS-II project title: Pre Silicon Validation and Verification

Short summary of work done during PS-II: We have performed detailed analysis on some of the design modules and we performed design checks on various designs.

Tool used (Development tools - H/w, S/w): Cadence innovus, ansys Redhawk sc etc.

Objectives of the project: Assuring power delivery network of the system. Checking DRC LVS and all other design related checks.

Major learning outcomes: Learnt deep about basic ASIC development flow and how to debug Design errors and Power network problems.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Great working environment and very supporting colleagues along with great helping mentors.

Academic courses relevant to the project: Advanced VLSI Design, CMOS VLSI Design, VLSI Architecture.

Name: HARSH TYAGI (2020H1230239P)

Student write-up

PS-II project title: ZEN-V Verification

Short summary of work done during PS-II: The initial 2-3 months were part of training. After that my work was on code coverage. Performing the UNR, setting up the parameters and caf files and running the coverage for different metrics and analysis of coverage report. Then moved on to functional coverage and working on the user specified covergroups for coverage analysis.

Tool used (Development tools - H/w, S/w): Verdi, DVE, GVIM and other tools.

Objectives of the project: Coverage analysis of the ZEN-V various versions.

Major learning outcomes: Exposure to SV, UVM and coverage analysis.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good working culture with flexible hours for WFH. The team members and managers were very approachable

and always willing to help and provide guidance. The expectations from interns were reasonable and achievable.

Academic courses relevant to the project: Digital VLSI Design, VLSI Architecture.

Name: NIPANE UTKARSH NARESH (2020H1230323H)

Student write-up

PS-II project title: Physical Design Verification

Short summary of work done during PS-II: Working as an intern in COS (Convergence and Sign-off) team, I received training in PDN (Power Delivery Network) / PDV (Physical design verification) / PISI (Power and Signal Integrity). The COS team as name suggests is responsible for sign-off before the tape-out phase. My responsibilities included running PDN / PDV simulations and analyzing / debugging the results to provide feedback to Placement and Route team. Initially the work started in getting familiar with the tools and LINUX directory structure for managing projects. The work will involve creating setups with required collaterals from BOM such that we make sure we are analyzing the given design with standardized setup. Once the runs are completed, the results need to be analyzed on IR drop/ Electromigration for PDN and thorough DRM (Design rule manual) study is required to debug the PDV errors. In the process of working on a particular block of SoC, the verification will result in feedback to solve the problems faced and subsequently new iterations of the design (with applied feedbacks) needs to be analyzed until it passes all the checks for the tape-out.

Tool used (Development tools - H/w, S/w): Innovus, ICC2, Voltus, Redhawk, Calibre.

Objectives of the project: To verify the robustness of Power Delivery Network, Power and Signal Integrity and Physical design checks like DRC, LVS, MRC etc.

Major Learning Outcomes: Understanding the metrics involved in physical design with constraints specific to particular technology node.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment is great wherein your superiors will help you overcome the obstacles in learning. We need to be proactive with clearing doubts for an effective work. The work allotted needs to be completed within the stipulated time with flexibility in working hours during the day.

Academic courses relevant to the project: VLSI Design, CAD for IC Design.

Name: ABHINASH PRASAD DASH (2020H1400182P)

Student write-up

PS-II project title: Tpms2.4

Short summary of work done during PS-II: I am a part of a digital verification team and i support my team on verification end. My work is to make verification plan of the blocks in the project and check whether the testcase coded is running properly which signifies that our design is working as per our expectation. I also went through a number of testcases and their simulation which verifies the functionality of the block. Got a basic understanding how testbench is built and how testcases are running on it. Got an immersive experience on how to write my own testcase and also realized how UVM components helps in design reuse and how it helps us to save lot of time while buliding a new project from scratch. Got a basic knowledge on the scripting file which are used to configure the simulation environment and the compiler.

Tool used (Development tools - H/w, S/w): Cadence Vmanager, Xcelium, Simvision.

Objectives of the project: Developing a tyre pressure monitoring system for automobiles.

Major learning outcomes: UVM, System verilog.

Details of papers / patents: No such patents.

Brief description of working environment, expectations from the company: The working environment is great .The colleagues and my mentor are also great and helping. Whenever i faced any doubts they responded to me quickly and got my doubts cleared out. The working hours are quite great and flexible. It is a good place to work in.

Academic courses relevant to the project: Embedded design, VLSI testing ,VLSI architecture.

Name: SHIVIKA KHANDELWAL (2020H1400244H)

Student write-up

PS-II project title: IP extended verification using FPGA

Short summary of work done during PS-II: I validated an timer module IP using embedded C and debugger tools and then created a sub-system of an IP and validated it on FPGA.

Tool used (Development tools - H/w, S/w): H/W: FPGA S/W: GHS compiler, Debugger, Palladium, Vivado.

Objectives of the project: To validate an IP using FPGA.

Major learning outcomes: Learned about various tools like GHS compiler, palladium, debugger and got hands on experience in pre silicon validation of an IP by using FPGA.

Details of papers / patents: The main idea to perform extended verification of an IP on FPGA is that the simulation process takes lot of time to run a task in comparison which helps to emulation. In simulation, a design is basically converted into a program and from that the function.

Brief description of working environment, expectations from the company: Working environment of the company is really good. Everyone is so helpful and motivate others to work.

Academic courses relevant to the project: VLSI design, VLSI architecture, RC, Embedded system design.

PS-II Station: ODE Holdings, Inc, Arizona

Faculty

Name: Sindhu S

Student

Name: MAYANK CHATURVEDI (2017B4A70548G)

Student write-up

PS-II project title: Components of a Secure Backend System

Short summary of work done during PS-II: Developed the backend for two applications, and scaled it for required concurrency. The two applications are live on app stores.

Tool used (Development tools - H/w, S/w): AWS, Python, Java, Postman.

Objectives of the project: This project deals with backend development, specifically about building efficient lambdas and infrastructure to handle large scale data flow. The backend system we design is efficient enough to collect and process data in a safe and secure manner.

Major learning outcomes: I learnt and gained hands-on experience with the AWS cloud infrastructure, backend development, and scaling. The art of designing the solution architecture, and incorporating changes in it collaboratively was an integral part of my job at ODE.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: I experienced a good environment living by the values of the "idea meritocracy". The collaboration at ODE is based on a flat hierarchy that increases the efficiency with which work is done. The CEO helped us with the technical doubts, and the executives at ODE are approachable for any kind of help. The scrum master focussed a lot on counting number of hours put in by the interns.

Academic courses relevant to the project: DSA, OOP, DBMS.

PS-II Station: Ola Electric, Bengaluru

Faculty

Name: Paramesw Chidamparam

Student

Name: SOMBHOTLA MANI KRISHNA HEMANTH (2020H1060204P)

Student write-up

PS-II project title: Thermal analysis on battery management system

Short summary of work done during PS-II: This work is related to a comparative study of the effect of change on certain parameters which influence the thermal behavior of the BMS board. From this project, I was able to learn CFD tools such as Flotherm-XT and Star-CCM+. The whole project is to choose an appropriate external casing material for the battery pack and heat sink to maintain the BMS board components' temperature rise within the operating limit. The

experimental analysis is carried out along with numerical validation. Later changing parameters in pack level is carried out and a comparison study is done using CFD tool.

Tool used (Development tools - H/w, S/w): Flotherm-XT, Star-CCM+.

Objectives of the project: The objective of this project is to know the temperature rise in Battery Management system board components under different operating conditions. To observe the temperature rise in components of BMS by changing material properties and forced convection.

Major learning outcomes: Understanding Electronic cooling systems and influence of environment on the thermal behavior of electronic system. This project gave a direction while choosing the materials for the battery pack (external casing) and the necessary ventilation required to cool the components. Scope for further study involves design of heat sinks and arrangement of BMS components.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Work environment is good and friendly.

Academic courses relevant to the project: CFD, Heat Transfer, Fluid Mechanics.

Name: ABHISHEK GUPTA (2020H1060226P)

Student write-up

PS-II project title: Portable Charger

Short summary of work done during PS-II: Benchmarking the power units from different suppliers and ordering the samples of the most suitable power unit that meets companies demands to start the proto-evaluation.

Tool used (Development tools - H/w, S/w): Solidworks, Electronic DC load, Vector tool, CANalyzer, Environment Chamber, Thermocouples, Arduino.

Objectives of the project: Develop a portable charger for the ola scooter that will be suitable in the European market.

Major learning outcomes: Charger power units testing and plastic works in production.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Companies expectation is to get results and the finished product. It all looks chaotic but if you are willing to give your all then the learning opportunities are many.

Academic courses relevant to the project: No particular courses are required but knowledge of automobiles (especially ev), Solidworks (or any design software) will be helpful.

Name: G SIBA PRASAD (2020H1400176P)

Student write-up

PS-II project title: DC DC converter in EV

Short summary of work done during PS-II: Responsible for complete Electrical components interface and design creation along with cross functional teams in Two-Wheeler Segment. Functional tests related to electrical components along with creation of Design Validation Plan, DFMEA and Engineering Change Requests.

Tool used (Development tools - H/w, S/w): CANOE.

Objectives of the project: Learnt about the DC DC converter and overall the process of design of a component and validation.

Major learning outcomes: Learnt from generation of requirements to creating and performing validation activities of an electrical component in EV.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: OLA is a very fast paced company and hence the amount of work is very high. Opportunities available here was plenty and fellow colleagues are very keen to help and provide with all the required information.

Academic courses relevant to the project: Yes

Name: PATANKAR SHRAVAN VINAYAK (2020H1410145P)

Student write-up

PS-II project title: Chassis structural failure analysis and motor NVH analysis of OLA S1

Short summary of work done during PS-II: Chassis durability test rig development using pneumatics and Campbell diagram plotting for order analysis of the vibration data from PMSM.

Tool used (Development tools - H/w, S/w): Catman Easy, nCode Glyphworks.

Objectives of the project: Chassis durability and product development.

Major learning outcomes: Fatigue damage spectrum & Campbell diagram.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Working environment was open and free for idea sharing. working hours were flexible.

Academic courses relevant to the project: Material technology and testing, Dynamics & Vibration, mechatronics.

Name: ANMOL PAGARIA (2020H1410156P)

Student write-up

PS-II project title: A Thermally Efficient Design of Access Panel Heat Sink

Short summary of work done during PS-II: Worked as a Mechanical Design Associate for Battery Pack Designing Team. Work included Research, Feasibility Study, Proto Design, Continuous Improvement, Providing Assistance to Manufacturing Team.

Tool used (Development tools - H/w, S/w): Siemens NX, Altair Hypermesh.

Objectives of the project: This project aims to study the design of a Parallel Fin Heat Sink (for Electronic PCBs), its application in the optimum design of Access Panel Heat sink of the scooter Ola S1 Pro and exploring Sheet metal design tools for improving the Heat Transfer efficiency.

Major learning outcomes: Research, Part Design, Simulation and Sheet Metal tools.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Conducive for learning, Challenging and improving skills.

Academic courses relevant to the project: Product Design.

Name: MAKAM KISHORE (2020H1410158P)

Student write-up

PS-II project title: Battery pack safety design

Short summary of work done during PS-II: By doing the project, the work culture and the process of approaching the problem is a major learning. Learnt about battery vehicles and battery technologies. Research regarding thermal runaway gave broader scope in terms of safety and its importance. Learnt Siemens Nx software for designing the product and Altair hypemesh for analyzing the design components (only basics) /. Getting involved in improvement activities helped me understand the workflow of the life cycle management. Integrated cell holder design development gave the exposure to interact with the supplier teams and quality teams.

Tool used (Development tools - H/w, S/w): Siemens Nx, Hypermesh.

Objectives of the project: To make battery more safer for preventing thermal runaway.

Major learning outcomes: Understood the working of battery and the causes and effects of thermal runaway. Product development activities. Learnt the modelling software (Nx). Designed some parts with ownership in the battery pack. Learnt quality and production related design aspects.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Work environment is very fast and should be on toes to complete the tasks. The company meets the expectations in terms of the work content. The managers and colleagues were very friendly and experienced, could learn a lot from them. Visited plant to understand the field issues to be considered while designing the battery pack.

Academic courses relevant to the project: FEA, TEP, Product Design.



PS-II Station: ON Semiconductors, Bengaluru

Faculty

Name: Sanjay Vidhyadharan

Student

Name: AYUSH JAIN (2020H1240079H)

Student write-up

PS-II project title: WIFI/WLAN SOC Design Verification

Short summary of work done during PS-II: Developed a new Group & Testlist based Simulation/Regression Flow for running regression effectively. Developed DUT compilation flow and overall simulation report Perl script. Developed testcases for Clock Verification. Ramped-Up in design verification tasks. Debugged WDT, UART SPI, I2C, Timer testcases. Developed UART GPIO connectivity testcase for connectivity verification. Developed testcase for R8 WDT interrupt.

Tool used (Development tools - H/w, S/w): QuestaSim, Linux, GVIM, Visualizer (Mentor Graphics software version 2022.1).

Objectives of the project: To perform WIFI/WLAN 802.11 SOC/Subsystem verification using latest functional verification methodologies.

Major learning outcomes: Verilog, System Verilog, UVM, AXI, Joint Test Action Group (JTAG), Perl, Linux, QuestaSim, APB, WDT, UART, GPIO, ARM R8 Processor, ARM Generic Interrupt Controller.

Details of papers / patents: Not published any paper during PS-II.

Brief description of working environment, expectations from the company: Working environment of company is awesome. Seniors employees are very helpful. Team is small so, for learning purpose it is a very good place. Quantity and quality of work to do. As an fresher, all I expect to widen my knowledge in different aspects and to gain professionalism.

Academic courses relevant to the project: Reconfigurable Computing, Computer Networks, Research Practice, Study in Advanced Topics, Advanced Digital Communication, Introduction to Artificial Neural Networks, Mobile Personal Communication, VLSI Design.

PS-II Station: PayPal - Analytics, Chennai

Faculty

Name: Akshaya G

Student

Name: UTKARSH SINGH (2017B1A40848G)

Student write-up

PS-II project title: Site-Alerts Autoanalyser

Short summary of work done during PS-II: Developed understanding of the work of the monitoring teams, how do they monitor various applications using Docker system and how they identify a problem is present in the current system. Identified the problems present and proposed a solution for the problems and requirements for the core performance engineering team Identified the patten across stack and versions of applications which contributes to more alerts recently. Developed a python script to pull data from Signal Fx detectors and segment the data based on the impact (low, medium, high), by using REST API's and JSON files. Developed new features

which could be added into the system such as adding request count (Traffic) for the breached application for the better analysis of the issue for the Core engineering team Identified the bugs present in the current Site-Alerts system of Paypal and resolved the issues. Stored the data in Big Query and developed a dashboard on Data Studio to do analysis of the alerts (Quantitative analysis).

Tool used (Development tools - H/w, S/w): Python, Flask, Splunk(Signal Fx), Dockers, Postman, Big Query, Data Studio.

Objectives of the project: Understanding the monitoring system and build features for the existing site alerts project.

Major learning outcomes: Understanding of monitoring system in IT industry.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was great, the team was very supportive. They gave me sufficient amount of time to have a good understanding of the problem statement and learn the technologies involved in the project.

Academic courses relevant to the project: Object Oriented Programming, Data structure and Algorithms, System Design.

Name: SURAJ GUPTA (2017B2A30329G)

Student write-up

PS-II project title: Report generator for development tool issues

Short summary of work done during PS-II: This project aims to develop a report generator which analyses the messages in the slack channel of #abc in the PayPal workspace so as to

understand the performance and user feedback of the Console and helps generate a list of Frequently asked questions. This would be achieved with the help of building a Slack App or a Slack Bot which would help to improve the team's operational excellence and offer better user experience. It would be optimal to build a slack bot to streamline interactions on the slack channels and by bucketing and categorising the scraped messages into different unique categories it would be helpful for the team to understand the user feedback on the product.

Tool used (Development tools - H/w, S/w): This project develop and end to end report generator using the power of softwares like Python, RStudio, and using the concepts of Machine Learning, and Natural Language Processing in order to improve the productivity and efficiency of the existing product.

Objectives of the project: As of now there are a lot of queries being generated as an internal tool is transitioning to another tool with enhanced features. These are being generated through the messages in the slack channel of #abc in the PayPal workspace.

Major learning outcomes: This project aims to develop a report generator which analyses the messages in the slack channel of #abc in the PayPal workspace so as to understand the performance and user feedback of the Console and helps generate a list of Frequently asked questions. This would be achieved with the help of building a Slack App or a Slack Bot which would help to improve the team's operational excellence and offer better user experience. It would be optimal to build a slack bot to streamline interactions on the slack channels and by bucketing and categorising the scraped messages into different unique categories it would be helpful for the team to understand the user feedback on the product.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment in the company is very very good, people are helpful as well as the company gave the time to learn new things and climb the learning curve.

Academic courses relevant to the project: Computer Programming, Machine Learning, Probability and Statistics.

Name: RAGHAV KAPOOR (2017B2A80342G)

Student write-up

PS-II project title: Risk loss monitoring and forecasting at a granular segmentation

Short summary of work done during PS-II: As part of the BA Group, as a risk analyst at PayPal, the primary role was to monitor and forecast the transaction losses that PayPal faces and report these losses to the finance team and risk strategy team for using the data to make effective business strategies for the future. The key performance indicators included loss forecasting accuracy, quality of reporting dashboards and metrics, early detection of abnormal trends at rule level leading to early loss detection, improve redundancy of risk rules by monitoring their daily performance, support of overall loss target and granular segregation of loss forecasting to identify key segments to focus and build business strategies on. My main role was to identify the risks that the organization faces, and then use a data-driven approach to analyze the potential frequency and severity of these losses and identify trends for forecasting and scaling.

Tool used (Development tools - H/w, S/w): Teradata Simba, Python, Microsoft Excel, Sql, Powerpoint.

Objectives of the project: The primary objective of this project involved identifying the risks and potential losses that the organization faces, or may face, and then making use of a data-driven approach to analyze the potential frequency and severity of these losses and identify the cause.

Major learning outcomes: As part of my PS- II journey, I obtained a great opportunity to work at one of the world's leading Financial Technology companies PayPal, operating an online payments system in the majority of countries that support online money transfers. I was able to gain knowledge and learn about how a global firm in the payment ecosystem operates and get hands-on experience in working with data analysis and data science tools currently used by the world's leading firms. The experience not just involved exposure to the technical and business side of things, but also gave me an insight into the cultural aspect of working at a global company and how to work and collaborate in a team with brilliant minds and create a meaningful impact. I was

able to expand my existing knowledge of business statistics and work on tech stacks including Teradata and Python.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: PayPal is a purpose driven company and has a clear vision to keep growing its brand in the payments industry and continually help people all over the world. The 4 pillars that are the foundation on which the company conducts its business are Collaboration, Inclusion, Wellness and Innovation. PayPal follows a One team culture that resonated well with its main goal. Since for me the internship was WFH so I can comment that even in online mode the interaction with the team was regular and they provide ample opportunities to showcase your talent. Expect long working hours and an overall good working culture. Be prepared to multitask and manage the work along with the numerous learning workshops that PayPal conducts.

Academic courses relevant to the project: Probability & Statistics, Programming, Mathematics, Technical Report Writing.

Name: SRIRAM KODEY (2018A4PS0671H)

Student write-up

PS-II project title: Semantic Search Solution

Short summary of work done during PS-II: Started off with the development of a Document chunking library which can implement several different chunking strategies and later proceeded to develop a semantic search solution using different api's thus achieving the capacity to implement several different indexing methods.

Tool used (Development tools - H/w, S/w): Python, Docker.

Objectives of the project: Develop a complete semantic search solution along with a document chunking library.

Major learning outcomes: NLP pipelines.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Working mode was online. Team was very welcoming and supportive.

Academic courses relevant to the project: Data Science minor courses.

PS-II Station: PayPal - Software Engineer Intern, Bengaluru

Faculty

Name: Akshaya G

Student

Name: ANISH JAIN (2017B2AA1709H)

Student write-up

PS-II project title: Automation for Mobile Application

Short summary of work done during PS-II: The progress of one of PayPal's internal tools automation systems. The automated programme will assist in the maintenance and management of data testing on various mobile devices. Various new tech were used for the same and benefits include the saving of essential time and resources of the company.

Tool used (Development tools - H/w, S/w): Java, Appium, Sauce Labs, Jenkins, Git.

Objectives of the project: Create an automated application for the company's internal tool.

Major learning outcomes: Learnt about mobile automation, how to use a cloud platform for these things, using tech like appium, java for building the application and the work life in an industry.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment of the company is good, and the timings are also flexible. All the employees, team members were very helpful in assisting me for any kind of issues faced during the internship.

Academic courses relevant to the project: NA

Name: MAITRAYEE NAKADE (2017B4AA0882G)

Student write-up

PS-II project title: Isolated Component Testing

Short summary of work done during PS-II: Developed the structure for Isolated component testing setup for one of the team's repository. Automated the local setup in local as well as remote environments using automation tools. Created scripts for automated running of the whole setup. This setup helped in reducing time for validation cycle for team's weekly release.

Tool used (Development tools - H/w, S/w): Docker, Cypress and other internal tools.

Objectives of the project: To set up the isolated component testing framework for one of the team's product.

Major learning outcomes: Learnt the use of Containerisation, Micro-service Frontend Architecture, API Mocking, Simulators, Automation.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Working environment in the team was quite friendly. Overall a very healthy culture for personal and professional growth.

Academic courses relevant to the project: Object Oriented Programming.

Name: ACHYUT DWIVEDI (2018A4PS0125H)

Student write-up

PS-II project title: Google Typeahead

Short summary of work done during PS-II: 1. After my introduction to the team, for the first week, I was trying to understand the merchant onboarding app my team's working on, going through relevant documentations, and explore its code. 2. Writing unit tests for multiple components and modules for the app my team is working on for the next two weeks. 3. After that, I got my first project allotted on implementing google typeahead capability to the app's address component. Got guidance from my mentor to look at similar implementation in another PayPal app. For the next two weeks I was exploring and understanding the other app's code and testing out relevant API calls. 4. Ready with the knowledge to being typeahead implementation. I had a bunch of issues initially, but eventually I learned to conquer them and after 4 weeks I completed the implementation and demoed the new feature for my team. The demo was met with approval and valuable feedback. 5. After the project was finished, it was mostly fixing issues in the app, for example, regarding localized content resolution, integrating with PayPal internal analytics software, etc. which needed significant dev work. All of this to prepare the app for deployment in a test environment, and proceed to end-to-end testing.

Tool used (Development tools - H/w, S/w): Macbook Pro 2019 with macOS, Javascript, React.js, Node.js, Express.js, Kraken.js, and other company proprietary s/w tools.

Objectives of the project: Enhance the address component in my team's kraken app to fetch a list of address suggestions after user types out a few letters of their address, and auto fill the entire address if they select an option.

Major learning outcomes: Team work, communication, technical knowledge in Javascript with frontend dev tools such as React.js and view engines, and backend dev tools such as node.js, express.js and kraken.js.

Details of papers / patents: No papers / patents

Brief description of working environment, expectations from the company: Work from home environment, with almost daily standup meetings to let the team know what task everyone completed previous day and the task they'll continue with that day. There are bi-weekly sprints, planned at the first day of every two weeks to divide and assign tasks to every team member, and a demo session at the end of the second week if a new feature is to be showcased.

Academic courses relevant to the project: No, as my academic branch was out of my PS station's domain.

Name: NOEL JOHNSON (2018A4PS0497G)

Student write-up

PS-II project title: STI Web Report Application

Short summary of work done during PS-II: I made a web app for STI operations and Customer Support Team members to quickly extract and process results from STI DB based on input parameters to resolve business/merchant queries pertaining to generation, processing and/or

sharing of invoicing reports, tax documents etc., it also allows saving and reusing of frequently required search configurations.

Tool used (Development tools - H/w, S/w): VS Code.

Objectives of the project: A web app / portal for STI operations and Customer Support Team members to query STI DB based on certain input parameters.

Major learning outcomes: Java Tech Stack, Spring Boot tech stack.

Details of papers / patents: None

Brief description of working environment, expectations from the company: PayPal did provide resources for me to learn these new technologies. What I really liked was the constant daily meeting I had with my mentor, this helped me tremendously as he acted both as a personal mentor and guide. The demo sessions and the weekly meeting with my manager really helped me in shaping the project.

Academic courses relevant to the project: Object Oriented Programming, Databases Management.

Name: GARLAPATI YOGITHA (2018A7PS0438H)

Student write-up

PS-II project title: Migration of components from Rappstack to Raptor

Short summary of work done during PS-II: I was asked to make a sample REST API while learning spring boot. Post this, I was tasked with the migration project which included understanding the code, making HLDs, LLDs and presenting design documents before being given the go-ahead for implementation of a new component from scratch and creating json files

for the specifications and then implementing the code without a change in business logic. Towards the end, I also wrote UTs and analysed the feasibility of automating the code in future APIs.

Tool used (Development tools - H/w, S/w): Spring boot based internal tools, confluence, Postman, SQL Developer.

Objectives of the project: To achieve migration of a component from the legacy stack to a newer internal stack.

Major learning outcomes: Technical: Spring boot, Postman, internal stack, internal technical tools, SQL Developer, database connections.

Non-technical: Networking, importance of documentation, understanding of business operations.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The team was extremely supportive and willing to answer any questions that one may have, in addition to promoting a healthy work-life balance. The expectation was to be quick at learning the stack and to be curious about not only the tech skills but also the business and other initiatives.

Academic courses relevant to the project: OOP

PS-II Station: Paypal - Software Engineer Intern, Chennai

Faculty

Name: Monali Tushar Mavani

Student

Name: ADITYA MISHRA (2018A7PS0117G)

Student write-up

PS-II project title: Experimentation on the techniques to reduce inference time of udc scanner and creation of audio to speech conversion pipeline for determination of personal identifiable information

Short summary of work done during PS-II: Named Entity Recognition Pipeline. Enhancement of NER based unstructured document data pipeline for swifter identification of PII elements listed by GDPR. Used knowledge distillation based ALBERT to decrease the size of existing ML model for NER task. Pruned the model for decreasing inference times and better fine-tuning/training of model. Quantisation of model weights was done to improve inference times of NER based PII data identification. Audio to text pipeline. Build Audio to text processing pipeline and identify PII elements in generated transcripts. Use webrtcvad library to identify voice activity and silences. Segment large audio files based on silence occurrences. Apply fast Fourier transform and convert audio into Mel- spectrogram Using Nvidia's quartznet model converted speech frequencies found in Mel-spectrogram to transcripts. Identify PII data in transcripts using NER based pipeline.

Tool used (Development tools - H/w, S/w): Python, PyTorch, Intel Open VINO Toolkit, FFmpeg, Google Cloud Platform, Jira board, Confluence Page.

Objectives of the project: Reduce inference time and add another functionality to a pre existing software package developed by PayPal.

Major learning outcomes: Audio and Video processing. Named Entity Recognition.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Agile methodology is followed. Daily standup meetings are held to check on progress made and further plans. A demonstration is necessary at the end of two months. Interns are assumed to be of the same level as entry level employees thus project demands the same level of work.

Academic courses relevant to the project: Machine Learning, Introduction to Natural language Processing, Introduction to Deep Learning.

Name: AYUSH AGRAWAL (2018A8PS0568G)

Student write-up

PS-II project title: HSM Integration in Next-Gen Cloud-Native Encryption Service

Short summary of work done during PS-II: Did performance testing on HSMaaS. Worked on migrating from on-premises HSM to using cloud based HSMaaS.

Tool used (Development tools - H/w, S/w): IntelliJ, Jmeter, GoLang, C++, Java.

Objectives of the project: Migrate from on-premises HSM setup to Cloud based HSMaaS.

Major learning outcomes: Performance testing, Software development.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Good working environment, Helping teammates.

Academic courses relevant to the project: OOP

PS-II Station: Payu, Bengaluru

Faculty

Name: Sugata Ghosal

Student

Name: RAQEEB AHMED KHAN (2020H1120264P)

Student write-up

PS-II project title: Ongoing projects

Short summary of work done during PS-II: Worked on parts of ongoing projects.

Tool used (Development tools - H/w, S/w): Spring boot, spring webflux, django, git, Jenkins, jira.

Objectives of the project: Worked on parts of ongoing projects.

Major learning outcomes: Team work, critical thinking, backend development in Java and Python.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Excellent work environment, team members are very helpful and knowledgeable. Opportunity to work on actual projects and learn new technologies.

Academic courses relevant to the project: Object oriented analysis and design, software testing.

Name: SHUBHAM KUMAR JAIN (2020H1120270P)

Student write-up

PS-II project title: Admin Shell Script Platform

Short summary of work done during PS-II: List of all work done by me - 1. Admin Shell Platform
2. remove deprecated column from the database 3. remove RabbitMQ listener 4. Split sql files into multiples file top reduce the load time.

Tool used (Development tools - H/w, S/w): Pycharm, Postgres, Docker, DBeaver.

Objectives of the project: The objective of the project is to provide a platform to all TechOps and DevOps team where they can write, read, delete and update scripts in python and execute the exisiting script by selectiing any one of them if they have permissions.

Major learning outcomes: 1. Examination of real-world challenges, creativity and invention, and evaluation of their work's effects and influence.
2. Achieve set workplace objectives, good communication, initiative, effective work practises in a multidisciplinary team, and sound judgement.
3. A personal commitment to ethical behaviour, competent practise, compliance with legal and regulatory standards, assuming responsibility for their own job while appreciating others.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good working environment and very much helpful teammates.

Academic courses relevant to the project: No

PS-II Station: Pegasystems, Hyderabad**Faculty**

Name: Mohammad Saleem J Bagewadi

Student

Name: ABHINANDAN MANDAL (2020H1030059G)

Student write-up

PS-II project title: WebEx Bot development

Short summary of work done during PS-II: The Webex bot is written in python, deployed in AWS, uses Webwx Cards and Agile Studio API for its functionalities. Other than that, I was part of Team Nimbus in User Interface Tribe. Our team owns various parts of UI of Pega. I was given work like fixing bugs, testing patch releases, debugging build failures etc. Pega is java based platform, so Codes are mainly written in java, Javascripts, Node JS, React. You will get free access to various learning platform and 2 weeks of training in Pega App Development.

Tool used (Development tools - H/w, S/w): AWS, Vagrant, Visual Studio.

Objectives of the project: Create a bot which can provide links to documentation of all the areas of User-Interface in Pegas.

Major learning outcomes: Learnt to interact with AWS, Agile Studio API.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Team members and managers are very supportive. You will learn a lot of new technologies and experience in node/React will be very helpful for career development.

Academic courses relevant to the project: Cloud Computing.

Name: ATUL (2020H1030138P)

Student write-up

PS-II project title: Webex Bot for Internal use

Short summary of work done during PS-II: Learnt about pega platform, after that I was included in my team's daily work. In the first few days I learnt about the work which my team does and the modules owned by our team for the particular products of my organization. I was told to learn the technologies required for our team which included HTML, CSS, Javascript, ReactJS from the learning partners of Pega like udemy, edX, pega academy and so on. Over Udemy I have enrolled myself in courses to learn the basics of each technology and have completed most of the courses and continuing the rest. Meanwhile I was assigned the task to overlook the daily pipeline integration test failures related to our team which includes checking the number of tests that have failed and then fixing those tests (This is being done over VSCode and Selenium). Regarding the major project which was assigned to me during my PS was creating a WebEx bot for internal use of the company. The major features of this bot included interaction with user and providing the enquired documentation, reporting the feedback and creating bugs over AgileStudio (Pega product). This bot was created using the webex bot framework, AWS and AgileStudio. The development of the bot is still under progress. My daily task includes fixing pipeline test failures and fixing bugs assigned to my team for pega platform.

Tool used (Development tools - H/w, S/w): Vagrant, AWS, Pega Internal tools, Git.

Objectives of the project: To create a Bot for user's interaction internally over webex platform.

Major learning outcomes: 1. Integration testing and Selenium 2. Working with AWS and WebEx 3. Collaborative Software Development 4. Web Development using HTML, CSS, Javascript and React.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work Environment: Very friendly and healthy work environment in general, with few noteworthy

elements. Daily standup meets with entire team where progress, issues, and next steps are discussed. Almost every colleague at PEGA is freely approachable as long as there is a clear agenda for reaching out. Working standards are defined by their leadership principles. Work timings are flexible. Work/life balance is given a lot of priority.

Expectations: Learning attitude. Regarding the technical expectations, Knowledge of web development can be very useful especially javascript and react. Knowledge of Java, kotlin can also help a lot to understand the product.

Academic courses relevant to the project: Cloud computing.

PS-II Station: Petasense - Services & App Development, Bengaluru

Faculty

Name: Raja Vadhana P

Student

Name: PRAKHAR SANKRITYAYAN (2017B1AA0047G)

Student write-up

PS-II project title: Admin Dashboard

Short summary of work done during PS-II: I have worked on a wide range of projects which majorly involves an admin dashboard and a new RBAC role development. Admin dashboard gives the admins access to data across all the accounts registered on Petasense; it also provides them with tools to manipulate various things such as Device Association, Creation of new devices, Validating Erroneous Readings, etc. on a global level. The admin dashboard had the following tabs: Devices, Devices Health, Erroneous Readings, Account Analytics, and Event Analytics. All

these tabs had extensive use of filters. And lastly worked on introducing a new RBAC role called Petasense Viewer.

Tool used (Development tools - H/w, S/w): VSCode, Bitbucket.

Objectives of the project: To create an Admin Dashboard for global level functionality.

Major learning outcomes: Front End, Back End, Databases.

Details of papers / patents: No papers

Brief description of working environment, expectations from the company: Since it's a small company the level of interaction with other team members is really high. You get to learn a lot from other experienced members. They expect you to take full ownership of the work given to you. The work is challenging but the people are helpful, so you end up finishing your tasks on time. Work life balance is also nice.

Academic courses relevant to the project: Object Oriented Programming, Computer Programming.

PS-II Station: Pfizer Ltd., Chennai

Faculty

Name: Bharathi R

Student

Name: KAUSTUBHI KATDARE (2020H1460352P)

Student write-up

PS-II project title: Trajectory of Modern Drug Development: Regulatory Considerations

Short summary of work done during PS-II: The PS station allocates individual projects to help increase the knowledge base of student in the regulatory field. Hosting and doing backend work for the monthly GPO meetings. Helping the team with work I could do using the information available on the public domain.

Tool used (Development tools - H/w, S/w): NA

Objectives of the project: 1. To prepare an informative blueprint for the clinical drug development with respect to regulatory considerations 2. To identify major regulatory opportunities at each phase of the drug development process by health authority interaction.

Major learning outcomes: Learnt about various studies a drug undergoes during its development. Major interactions with the health authorities and how it helps.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment is very open and approachable. All the people are eager to learn something new. They help you in improving yourselves by including in their other regular activities outside the team.

Academic courses relevant to the project: Quality assurance and Regulatory Affairs (QARA).

PS-II Station: Piramal Group, Mumbai

Faculty

Name: Ankur Pachauri

Student

Name: ARYAN GUPTA (2018A7PS0017P)

Student write-up

PS-II project title: Partner Central

Short summary of work done during PS-II: I worked on improving a site called partner-central which helped users request money loans which normal banks might not give.

Tool used (Development tools - H/w, S/w): Java, SpringBoot, Software Development, SCRUM, AGILE, MongoDB, Redis, API handling.

Objectives of the project: Worked on fixing bugs on a site called as partner central and add various features in it.

Major learning outcomes: Java, SpringBoot, Software Development, SCRUM, AGILE, MongoDB, Redis, API handling.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment is nice, the management and the team focuses on the interns to learn, more than to produce results. The team makes sure you always get to learn new concepts and also learn about the business impact of your work which will definitely help us in the future.

Academic courses relevant to the project: Database systems, DSA, OOP.



Name: VISHAL SINGH (2018AAPS0562G)

Student write-up

PS-II project title: Java Microservices using Spring boot

Short summary of work done during PS-II: 1) Worked on creating a feature control service for internal use of other backend services 2) Worked on the notification service enhancements for the company.

Tool used (Development tools - H/w, S/w): IntelliJ, AWS, Spring Boot, Redis, Kafka.

Objectives of the project: Design backend microservices using Spring boot for the platform team.

Major learning outcomes: 1) Java microservices 2) Design, Test and deployment cycle of Industry.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The company had a smooth onboarding process where we designed an onboarding project using the company's current tech stack before moving to real projects. The senior staff, especially the Principal architect was supportive and helpful. The company has the work culture of a startup and WFH sometimes makes it more hectic depending on the team assigned.

Academic courses relevant to the project: OOP.

Name: ABHISHEK GUPTA (2020H1030131H)

Student write-up

PS-II project title: Assessing the credit risk

Short summary of work done during PS-II: I've majorly performed three activities in order to get the better understanding of the workflow and they are: 1) Develop comfort around querying data warehouse via python scripts- Create quick views of month over month loans sanctioned categorized by products. 2) Develop comfort around credit risk modelling lingo- Evaluate and compare the performance of two credit risk models. 3) Develop comfort around querying the data warehouse via python scripts Evaluate and visualize the Fico Score with respected to t3) Develop comfort around querying the data warehouse via python scripts Evaluate and visualize the Fico Score with respected to two variables.

Tool used (Development tools - H/w, S/w): S/w: Jupyter Notebook , Snowflake , PostGre Sql, AWS sagemaker.

Objectives of the project: The main objective of this project is to determine (the creditworthiness of potential borrowers and their ability to honor their debt obligations. If the borrower has a default acceptable risk, analysts may recommend approval of the loan application.

Major learning outcomes: 1) Learnt about the business model and architecture of the organization.

2) Develop comfort around querying data warehouse via python scripts.

3) Develop comfort around credit risk modelling lingo- Evaluate and compare the performance of two credit risk models.

4) Learnt about the various feature selection methods and how do we select the best feature selection method for our dataset.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Working environment is positive and light. Here I find myself learning new things everyday and gaining new skills and applying them to real world. Manager always appreciates the ongoing effort of mine and empowers me through positive feedback and reinforcement.

Academic courses relevant to the project: 1) Data Warehousing 2) DBMS 3) Machine learning

4) Cloud Computing.

Name: YASH JAIN (2020H1030158H)

Student write-up

PS-II project title: 1. Platform migration of on premise code to cloud 2. Customer Contact Tracing

Short summary of work done during PS-II: I have worked on two different projects, the objective of first project was to migrate all the data tables, SQL and python scripts which were running on the on premise machine to cloud instances. My role in this project was to write and modify several python and SQL scripts as and when needed and make them suitable for cloud environment. I have also worked on migrating the master_code script written in python from the on premise aiae bot to WVD machine. The process required migrating all the dependencies of the master code and making a few changes to them. My second project was on data analysis, a project given by the sales team, here the objective was to perform a thorough data analysis and get the month on month trend in the contact information gathered from the customer, in this project the techstacks used were python, SQL, Power BI, MS- excel. Here I wrote several python scripts to validate email ids and mobile numbers and automate the process of analysis, used SQL to fetch data from database tables and MS excel to perform the analysis.

Tool used (Development tools - H/w, S/w): Sublime editor, Visual code studio, pgadmin, WVD machine, Power BI, MS excel, snowflake.

Objectives of the project: 1. Platform migration of on premise code to cloud: Getting rid of on premise system dependencies to execute the code. Code to be running 24*7 in cloud machine. 2. Customer Contact Tracing: This project aims to automate the process of tracking the month.

Major learning outcomes: Learnt and had hands on experience on technologies like Python (majorly used pandas, numpy, regular expressions, psycpg2, win32com.client etc), SQL, MS

Excel and used them on real time project of Data analysis and cloud migration. Also learnt about PostgreSQL and Snowflake.

Details of papers / patents: None

Brief description of working environment, expectations from the company: As a part of PCHFL BIU team, I got introduced with the working culture of corporate world, mentors here are very helpful they guide me through the projects, helped me with the tech stacks where ever I got stuck, I had a great overall experience working with the team here.

Academic courses relevant to the project: Yes a few courses like Cloud computing, Data warehouse, Data mining were relevant to the projects.

Name: KHUBCHANDANI ASHISH JAGDISH (2020H1030159H)

Student write-up

PS-II project title: 1) Customer Attrition Analysis 2) Customer Interaction Data Analysis

Short summary of work done during PS-II: 1) Worked on Word Error Rate algorithm, applied it to call transcriptions. 2) Wrote scripts for analyzing the call transcripts available in different languages using the WER Algorithm. 3) Drew comparisons among various cloud services helping in call transcription. 4) Performed Data gathering about the customer for Model building. Used SQL for the same. 5) Built different Customer Attrition Prediction models and analysed which one amongst them performs better. 6) Analysed the Customer Interaction Data so that the analysis can be used for Customer Service in more efficient way. 7) Apart from above things, also worked on some mini projects.

Tool used (Development tools - H/w, S/w): Laptop, Amazon AWS, Microsoft Azure, Dbeaver, Postgre SQL, Anaconda, Jupyter Notebook, Jira.

Objectives of the project: Project – 1: Machine learning model that scores customers on a monthly basis and identifies customers that are most likely to attrite or Pre-close loans.

Analyse the trend among the customers opting for preclosure.

Project – 2: Finding the top Qu.

Major learning outcomes: 1) Leant about how a fintech works. 2) Learnt about different businesses of the company. 3) Built ML models for various usecases. 4) Learnt how to analyse the data by doing EDA analysis.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was pleasant. The managers gave enough time for us to learn things and then implement those and helped wherever we got stuck. The expectations from the company were met as I got to work with real world data and solved Customer problems using Machine Learning.

Academic courses relevant to the project: 1) Deep Learning 2) Advanced Data Mining.

Name: DAMU JITENDRA (2020H1420190P)

Student write-up

PS-II project title: Supporting Business Functions by creating tools and reports

Short summary of work done during PS-II: The relevance of domain knowledge and the process of business understanding, problems associated with it and finding solutions to it. Translating the solution to logic using Python and showcasing it in a format which can be easily perceivable. Report generation where raw files are taken as input, cleaning, transformation, setting the data outcomes in a required format, creating a custom template, printing the outcomes using the template to generate a report. A HR dashboard using excel, which is used to track actual and budget cost, the head count of all the employees in the business. Supply chain project-Dispatch optimization engine where a custom logic is written for allocation of stock based on the

sales forecast and catering to the stockouts, distribution of stock can be handled. Stock availability with the remaining shelf life, for all the products in different ware houses and auto-mailing the respective insights to respective the Brand Managers. Sales officer duplicate claim tracker to help audit team minimize time in going through all the claims. Finding inter-distances of various outlet within an area using BING Maps API. A comparison of sales in E-commerce and General Trade of the same SKU all over India at a pin-code level to identify areas which have potential for growth. Tracking Quality of Hire of Sales executive based on certain parameters and calculating a score against a bench mark. Brand wise area level sales ranking according to their achievement percentage based on their respective targets.

Tool used (Development tools - H/w, S/w): Python, Excel, VBA.

Objectives of the project: To generate automated reports and send it to various stakeholders. Create tools to increase visibility, tracking the metrics.

Major learning outcomes: Writing Modular, clean scripting code. Core Analytics approach to a business problem from scratch.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: It is a fast paced environment. The team actively interacts with various stakeholders on day to day basis. The data is of many sort, so RBDMS is not available. The work is non repetitive and will have opportunity to work with most of the business functions.

Academic courses relevant to the project: Supply chain management.

Name: PATEL SMITKUMAR NILESHBHAI (2020H1420201P)

Student write-up

PS-II project title: Pre-Qualified model 2.0

Short summary of work done during PS-II: My task is to build the improved version of Pre Qualified model that is already live in the company. In this project, I have written python function for different variables those required to build the PQ Model 2.0. I have been also working on the debugging of the codes. I have also done data cleaning, data analysis, use statistical method to give the solution for small tasks given to me.

Tool used (Development tools - H/w, S/w): Python, Spyder IDE, Jupyter Notebook, Snowflake, PostGre SQL, MS Excel, AWS EC2.

Objectives of the project: The objective of this project is to Pre-Qualify good customer from the large data received from the partners companies.

Major learning outcomes: Piramal Finance business understanding, Use of Data science in Finance, Coding skill improved.

Details of papers / patents: None

Brief description of working environment, expectations from the company: I have done my internship in business intelligence unit of Piramal Capital Housing And Finance. I was working with Risk analytics team. My working experience with this team was amazing. Due to Covid-19 scare internship mode was work from home. They have provided the laptop and 5 days in a week working policy. In starting of internship, My guide involved me in all the projects that he was working and give me some small tasks. so that i got familiar with the tools they are using in the company. It is a finance related company but I have not much understanding of various terms related to finance. but during this internship I have learnt use of data science in finance as well as the finance business. My manager and guide always there to help me but first i need to solve the problem by myself while coding and other technical stuff. It was amazing to work with this team.

Academic courses relevant to the project: Yes, I have done my projects related to machine learning in SAT.

PS-II Station: Pitney Bowes India Pvt. Ltd., Noida

Faculty

Name: Ramakrishna Dantu

Student

Name: RAMANDEEP MAKKAR (2020H1120378P)

Student write-up

PS-II project title: Data Analytics and Notebook Sharing

Short summary of work done during PS-II: The internship at Pitney was an exceptional opportunity towards enhancing own knowledge and skills in Data Analytics domain. I was assigned to Commerce Cloud Data Team which primarily is responsible for ensuring data management through various cloud technologies and to enhance business value by identifying various insights into available data using various tools. Initial project that was assigned, was regarding exploration of KNIME Analytics Platform for data analytics. KNIME is an open source platform that provides a graphical and no-code interface to users for solving the data analysis problems and developing ML models. The assigned task of an NLP problem was converted to KNIME platform and satisfactory accuracy was achieved. Second project (major project) comprised of developing an application to enable sharing of python notebooks within the organisation amongst team members to facilitate collaboration. It comprised of utilizing an open source github repository (nbss) and implementing own additional requirements using the existing code. The application was to be hosted on the private cloud of the organisation on AWS and the data(python notebooks) were required to be stored in S3 bucket. The planned objective and functionality was achieved by the completion of internship.

Tool used (Development tools - H/w, S/w): H/w- Intel i5 PC. S/w- Python, Jupyter Notebook, AWS, VS Code.

Objectives of the project: Develop an in-house application for facilitating sharing of python notebooks amongst team members for collaboration.

Major learning outcomes: Gained knowledgeable insights into Data Science / Analytics and Cloud Computing Platforms.

Details of papers / patents: The project involved development of a new application to address the organisational requirements by utilizing open source repository.

Brief description of working environment, expectations from the company: I extend my gratitude to Pitney Bowes India Pvt Ltd for providing me an enriching experience while performing as an intern. The work environment at Pitney Bowes is one of the best in the industry and rightly so as they have recently been awarded the best places to work at in 2022. The management, team and everyone around is extremely helpful and approachable. It is extremely conducive environment that facilitates the team members to contribute to the assigned task with utmost sincerity. The interns are provided every opportunity to interact with the top management, gain insights and express themselves. Additional initiatives undertaken are appreciated and recognized adequately. The vision shared during interaction sessions was helpful in understanding the approach and working of the organisation. The professional experience, knowledge and tasking shared with me by the Commerce Cloud Data team is worth numerous accolades. The knowledge enrichment extended has been a remarkable value addition during the internship. I humbly thank the the Unified Analytics Project team for guiding me in understanding and working on the project problems.

Academic courses relevant to the project: Data Mining, Cloud Computing, OOAD.

PS-II Station: Playment Inc – Non-Tech, Bengaluru

Faculty

Name: Ramesh Venkatraman

Student

Name: SWATI TAPARIA (2017B2A31034P)

Student write-up

PS-II project title: Product Design, Analysis and Documentation

Short summary of work done during PS-II: Designed a prototype for resource allocation optimization and mocked the data flow for the same, documented the product for internal operations, documented complicated technical data for sales enablement.

Tool used (Development tools - H/w, S/w): Figma, Notion.

Objectives of the project: Design a product for resource allocation optimisation, product analysis for existing product, documentation for product and sales enablement.

Major learning outcomes: Wire-framing, designing, critiquing a product, documenting a product.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Wfh, flexible timings, healthy work life balance and work environment.

Academic courses relevant to the project: NNFL, creative writing, technical report writing.

PS-II Station: Playment Inc - Tech, Bengaluru

Faculty

Name: Pradheep Kumar K

Student

Name: R ROHIT (2018A7PS0224P)

Student write-up

PS-II project title: Human-in-the-loop 2D Image Segmentation

Short summary of work done during PS-II: I proposed a two-stage click-based interactive segmentation approach which achieved a pretty good IoU in very few clicks. Although this tool cannot be used independently to completely segment objects, it significantly decreased the time needed by annotators thus achieving partial automation. I further worked with the frontend/backend team to incorporate my segmentation approach into Playment's tool. In this phase, I learned the challenges and ways to overcome them when it comes to model deployment.

Tool used (Development tools - H/w, S/w): There's a lot of python scripting and model experimentation involved. Python, OpenCV and PyTorch are the main language/frameworks used.

Objectives of the project: Currently, the most popular methods for annotating images for image segmentation consist of drawing polygons around the objects or painting over the object using a paintbrush tool. However, this involves a lot of manual effort and is very time-consuming.

Major learning outcomes: I was able to learn a ton of new concepts mainly in computer vision and deep learning. This was largely due to the nature of my project being open-ended which led me to read many research papers, interact with ML engineers in my team and carry out several experiments. I dived into topics spanning interactive image segmentation, salient object detection, lane detection and background subtraction. There is lot of coding involved mainly in Python and the OpenCV and PyTorch frameworks. Work is relatively fast-paced and 5 months might not be

a long time to propose novel algorithms. However, the ML team is very encouraging and you can experiment any ideas that come to you. I was also able to learn many traditional computer vision algorithms and use them effectively to enhance the performance of deep learning models.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The Playment team is very friendly and encouraging. If you are new to CV/DL, they give you around 2-3 weeks to learn the basics and then start your work. The ML engineers create interesting projects for you doing these starting weeks. If you are already familiar with the topics, you can get started right away with your main project. There is no pressure to complete work quickly but that said, its important to make progress over the weeks. We had standups thrice a week on alternate days.

Academic courses relevant to the project: NNFL, ML.

PS-II Station: Pokarna, Hyderabad

Faculty

Name: Naga V K Jasti

Student

Name: KALKIVAI AVINASH (2020H1010024H)

Student write-up

PS-II project title: Research and development of quartz surface designs using latest technologies

Short summary of work done during PS-II: 1. Studied and analyzed all the processes, machines involved and the process flow of quartz surface manufacturing. 2. Prepared quality reports from weekly production data to help identify problems in each code. 3. Help set-up lab and prepare SOP for lab equipment's for final product testing. 4. Assisted in development of new quartz surface designs using Breton's latest robo technology. 5. Testing of new pigments for quartz production. 6. Optimization of press parameters and analysis on effectiveness of vacuum and pin hole cycle.

Tool used (Development tools - H/w, S/w): Nil

Objectives of the project: 1. To understand the process and production of quartz surface using Breton stone technology and assist in development of new designs. 2. To study various defects that are seen in quartz surfaces, identify the source of defects and recommend a solution.

Major Learning Outcomes: 1. Quality control practices in an engineered stone Industry.
2. Production process of quartz surfaces.
3. Analysis of defects and measures taken to avoid defects and improve production in future.
4. Process optimization and its impact on production time and cost.
5. Operation of Calcutta unit which is key in creating Calcutta designs.
6. Preparation of lab equipment SOP for final product testing.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: 1. Fast paced production driven work environment. 2. State of the art facilities for production and lab. 3. Option to work on a variety of small projects alongside major project. 4. Friendly workplace and senior managers had an open door policy.

Academic courses relevant to the project: Nil

PS-II Station: Porter - Tech, Bengaluru

Faculty

Name: Ritu Arora

Student

Name: DHRUV AGARWAL (2018A7PS0263P)

Student write-up

PS-II project title: Backend Development

Short summary of work done during PS-II: Worked in backend team to create a microservice for managing loans that are given to drivers working for Porter.

Tool used (Development tools - H/w, S/w): Kotlin, Ktor, Ruby-on-Rails, Git, Jenkins.

Objectives of the project: Building a microservice to manage disbursement of loans to customers (drivers).

Major learning outcomes: Domain driver design principles, microservice architecture, hexagonal architecture, Kotlin, Java, Ruby-on-Rails.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was pleasant. The managers helped wherever we got stuck.

Academic courses relevant to the project: DSA, OOPS, CN (marginally).

PS-II Station: Q2e Banking, Bengaluru

Faculty

Name: Ritu Arora

Student

Name: SARASIJ JANA (2020H1030045G)

Student write-up

PS-II project title: Integration Adapter Monitoring Dashboard

Short summary of work done during PS-II: Had to go through all the basic modules to understand Salesforce. After that, I received KT from my senior developers and I also have go through the Confluence pages for understanding what Integrations and Adapters are and what is the work-flow. I have worked on the Backend changes on Framework for the Dashboard. Apart from this, I have also worked on various Framework level changes, bug fixing and testing.

Tool used (Development tools - H/w, S/w): SALESFORCE, VsCode, Postman, JIRA, Git, GitHub, Apex, JAVA.

Objectives of the project: An integration dashboard is a visual representation of usage of the adapters. While it may be utilized in a variety of ways, its primary goal is to enable quick access to information on API usages such as the request metrics, failure metrics and performance.

Major learning outcomes: Got familiar with SALESFORCE, Apex, JAVA, Database, SOQL, CL Integrations Code Flow, Lightning Web Component (LWC).

Details of papers / patents: None

Brief description of working environment, expectations from the company: Excellent Work culture, good work-life balance, good guidance and support from manager, tech lead and senior developers. Got exposure to industry level code, their work flow and documentation.

Academic courses relevant to the project: Database, OOPs, Cloud Computing, JAVA.

Name: ANANAY SHARMA (2020H1030072G)

Student write-up

PS-II project title: Q2 Loan Servicing

Short summary of work done during PS-II: Trained on the technologies used to develop the product; Salesforce, Apex Programming, Apex Databases, Visualforce - Introduced to the product and its scope, learnt about the business aspects of the product; loan servicing - Resolved bugs for the customers of the product; learnt about debugging, learnt about the product code flow surrounding the bugs - Assigned with the development of a new feature to be added to the product; learnt about creating a high level design and low level algorithm implementation details decided by the technical and business requirements.

Tool used (Development tools - H/w, S/w): Salesforce, Apex language, GitHub, Visual Studio Code.

Objectives of the project: Feature development and maintainance of the software product.

Major learning outcomes: Feature development, debugging, MVC model, documentation, Apex programming.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment

- I was part of a team that was responsible for the Q2 Loan Servicing product
- Everyone is friendly and never turned down any request to help during the internship
- No sense of hierarchy, inputs for improvements are always welcome
- A very good work-life balance
- Responsibilities were given fairly early, from the very next day after the training
- I was invited to be a part of daily stand-up meetings from the very first day of joining
- Interns were asked to give inputs to improve on the UI/UX of the product

Academic courses relevant to the project: NA

Name: SHAHID NAZIR SHAH (2020H1030120P)

Student write-up

PS-II project title: Q2 loan servicing

Short summary of work done during PS-II: During the internship, the student was trained on various skills and tools like Salesforce, Git and Github, Jira, Apex programming language etc. The student was also given sessions about the project by his mentor. The student was then assigned some low priority internal project bugs. The student fixed the internal bugs and included the fixes in the patch releases. The student was then assigned multiple customer bugs from different clients subsequently. The student apart from fixing them also wrote test cases for them and included them in latest patches. Apart from this the student gained a good understanding of some the important concepts of loan on which the project was based on and learned how they were implemented in code.

Tool used (Development tools - H/w, S/w): Apex Programming Language, Salesforce Developer Console, vsCode, Confluence, JIRA, Git and Github.

Objectives of the project: During the internship, the intern worked on Q2 Loan Servicing Project which is based on Salesforce, Apex and VisualForce. The objectives of the project are to provide a complete loan servicing application that automates loan billing, payment, etc.

Major learning outcomes: The major learning outcomes of the internship are discussed below:

1. The student practiced and improved his industry skills while also learning how to work.
2. The student learned a new set of tools and technologies and gained some experience while working on them.
3. The student improved his communication and collaboration skills with different professionals in the work environment.
4. The student learned what the roles and responsibilities of a particular career are, from people working in the field.
5. The student learned how to have a balance between work and life.
6. The student improved his coding skills by applying them on a real life project.

Details of papers / patents: No papers or patents were worked on or published during the time of Practice School.

Brief description of working environment, expectations from the company: The working environment in Q2e-Banking is really good. There is good work-life balance. The team that the student worked with was friendly and helpful. The team members are greatly skilled and knowledgeable and help whenever the student had any doubts or didn't understand anything. Also, the team members were respectful of each other's ideas and suggestions. There are also multiple events every week and every month like Fun Friday's. As an intern, there was a smooth transition for the student from learning the required skills and then learning about the project and then gradually applying his learned skills to the project. For the student, all the expectations that he had from the company were met.

Academic courses relevant to the project: Cloud Computing (SS G527), Object Oriented Analysis and Design (SS G514).

Name: SANDEEP JOSHUA DANIEL (2020H1030135P)

Student write-up

PS-II Project Title: Investigation into Migration from v1 Skuid to v2 Skuid

Short Summary of work done during PS-II: Migration and testing of pages from v1 to v2.

Tool used (Development tools - H/w, S/w): Skuid, Visual Studio, Salesforce.

Objectives of the project: To determine the problems that would be faced when migrating from v1 skuid to v2 skuid and weigh the benefits.

Major learning outcomes: Javascript, Salesforce, Skuid.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good Working Environment.

Academic courses relevant to the project: NA



PS-II Station: Qualcomm India Pvt. Ltd.,- Bangalore, Bengaluru

Faculty

Name: Rejesh N A

Student

Name: AMIT SANJAY KSHIRSAGAR (2018AAPS0381G)

Student write-up

PS-II project title: SoC DV of UFS and VC Formal Connectivity Check

Short summary of work done during PS-II: Learnt about the basics of verification process, amba bus protocols, and about UFS block in depth. My role was to carry out the SoC verification of UFS block, meaning to verify the functional correctness, and the performance, power targets for UFS block at SoC level. Apart from that I had also implemented connectivity check using the formal verification method, to verify the connectivity at the SoC level. This was done to save the time wasted on debugging after getting an error post simulation.

Tool used (Development tools - H/w, S/w): Linux, Verdi tool, Qualcomm Proprietary tools.

Objectives of the project: To work on SoC verification of UFS Block, and secondly to perform connectivity check using formal verification method.

Major learning outcomes: Learnt about SoC verification, UFS Block, and formal verification.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was really good. Everyone in the team was very supportive and helped me a lot, and both my manager and mentor were really helpful during the ramp up phase. Enough time was given to learn about the work that I would be doing there. The weekly meetings held helped me understand my mistakes and track my progress. Overall it was a very good learning experience.

Academic courses relevant to the project: Embedded System Design, Computer Architecture, Microprocessors and Interfacing and Digital Design.

Name: PAVAN P PRABHU (2020H1030108H)

Student write-up

PS-II project title: Headset Application Development

Short summary of work done during PS-II: Completed the Qualcomm introductory courses like Ethics, Code of Conduct, Cybersecurity, COVID-19 Protocols, etc. In the technical training, I understood the underlying technologies and the tools used by the team to develop the headset application alongside understanding the codebase/architecture of the live project. Identified and resolved JIRA bugs related to domains like USB, BT, Audio/Mic, etc. Updated the architecture of the project for improved performance and flexibility in using the device and developing features for the audio peripherals. It made the architecture scalable to build more features and also use the same code base for multiple audio peripherals. This change in architecture also helped in identifying bugs and debugging the code easily. Performed unit testing and Integration of features.

Tool used (Development tools - H/w, S/w): S/W: Perforce, JIRA, Fisheye, pydbg, Docker, Klockwork, Hydra, Source Insight, MDE, CI, Audio Dev Kit, Wiki, Confluence, Plant UML, Qualcomm proprietary software. H/W: Debugging board/Scarlet board, Qualcomm audio chipset.

Objectives of the project: The project aims to use next-generation technology to develop features for bluetooth-enabled voice and music device families, including various peripherals like headphones, earphones, speakers and other accessories that support the latest technology.

Major learning outcomes: -The architecture and code base provided understanding of the work flow followed by the team.

-Got an idea about how programming is done in embedded devices.

-Exposure to working on hardware and remote setups.

-Opportunity to work closely with team on a live project and further develop my skill set.

-Good insights into what to keep in mind when resolving issues and debugging code in a live project and using advanced tools for live debugging.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work environment and the team is very accommodating and supportive of a fresher in the embedded domain. There were weekly team meetings regarding the ongoing projects and open issues and also there were monthly one on one meetings with the manager where the discussion was mainly centered on the employee's career development and goals they wanted to achieve on a periodic basis. The company took care of employees' health by providing nutritious food in the cafeteria. The manager, mentor and the team members were approachable at any moment for any doubt clarifications or work-related miscellaneous issues, in both the remote and the onsite work location. Apart from the technical learning, this company provided me exposure to many programs organized by the company such as fitness programs, entertainment, and many more, along with these, there would be frequently programs where we can directly interact with well-experienced employees across the world and take guidance, and accordingly, plan our career. The company expected me to complete and follow the new hire guideline courses and follow the NDAs and CCIs and actively take part in mock drills that take place for raising awareness among the employees. The team-specific ramp-up aimed to train me on the workflow, codebase, tools and technologies of the project and expected me to implement and test features and also perform bug fixes.

Academic courses relevant to the project: C Programming, Advanced Computer Architecture.

Name: GOSAVI CHINMAY RAJAN (2020H1120262P)

Student write-up

PS-II project title: Development of tools for DSP on Windows platform

Short summary of work done during PS-II: Worked on developing tools which utilize the DSP (Digital Signal Processor), for example - application utilizing neural networks. Also developed an automation framework to automate execution of these application on DSP to ensure features are working after updates to the DSP system software.

Tool used (Development tools - H/w, S/w): Python, WinDBG, Git, Powerhsell.

Objectives of the project: Build tools for DSP (Digital Signal Processor).

Major learning outcomes: Overview of application utilizing DSP and basic exposure to how to offload workloads to DSP.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is good. The seniors are approachable for any query and are supportive. Rest of the facilities provided by the company are also good.

Academic courses relevant to the project: OOPS, Machine Learning.

Name: SOUVEEK PRADHAN (2020H1120268P)

Student write-up

PS-II project title: Power Consumption & Optimization of SoCs and subsystems

Short summary of work done during PS-II: Nowadays, the microelectronic devices have SoCs with high degree of compactness. These SoCs are being used in a huge number of equipment varying from large automobiles to small handheld devices. So power dissipation of these SoCs is becoming a critical concern. Accurate, efficient power analysis and estimation during the design phase at all levels of abstraction is highly necessary in order to achieve low power consumption without a costly redesign process. It also helps in understanding and identifying the crucial background processes that are required to keep all the functionalities running smoothly. This report covers the basics of power analysis and about a Python parser which helps in calculating the peak power usage of any given SoC.

Tool used (Development tools - H/w, S/w): Hardware- JTAG Debugger by Lauterbach, Kratos, Languages used- Python.

Objectives of the project: To understand and optimise the power utilisation of the SoC and subsystems.

Major learning outcomes: Learnt about Real time operating systems, high level architecture of the system, system analysis and power usages across subsystems on a SoC.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Since I am from CS background, grasping concepts related to electronics was difficult. But my team was very helpful in making me understand a lot of concepts. Overall the working environment was very good and friendly.

Academic courses relevant to the project: Real time systems(RTS), Software for Embedded systems (SES).

Name: LAVANYA VASHISTH (2020H1230157G)

Student write-up

PS-II project title: Emulation of modem for target MDM chip

Short summary of work done during PS-II: During the internship I was chiefly involved with the conversion of ASIC definition of modem to FPGA friendly design by changing various aspects of the HDL definition such as memory, clocks, etc. Modem emulation is particularly challenging because it contains RF components which aren't FPGA friendly. I was also involved in the debug process of the same as well as the setting up for the environment/ doing actual sanity checks for modem blocks of the various SOC's being emulated.

Tool used (Development tools - H/w, S/w): Vivado, Verdi, Linux, TCL, Python, Veloce, Verilog, SV.

Objectives of the project: To replicate the functionality of the modem block on FPGA for advanced functionality testing and firmware development.

Major learning outcomes: The internship provided a keen insight into the architecture of the modem and the difference between the clocking in FPGA and ASIC along with the advancement of the understanding of mixed signal design and the debugging procedures.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Qualcomm being an industry leader in the hardware space has a very streamlined way of functioning and each member of the team know their place in this well oiled machine. Everyone I have worked with were deeply knowledgeable and happy to solve the most basic of doubts. They were friendly and despite my remote onboarding, made sure that I have the required help and am felt included in the team.

Academic courses relevant to the project: Reconfigurable computing, analog and mixed signal design, CAD for IC design, VLSI architecture.

Name: KAZA AMARESWARA PHANI TEJA (2020H1230165G)

Student write-up

PS-II project title: Post Silicon Validation of Automotive SoCs

Short summary of work done during PS-II: I have mainly worked on automation of an existing workflow using python scripts. The scripts which I developed helps the team in compiling and executing tests on different projects remotely with minimal intervention, thereby saving a lot of time and avoiding errors. I have also done multiple enhancements to these scripts which help in working with multiple tasks simultaneously and support different environments as well.

Tool used (Development tools - H/w, S/w): Python, Shell scripting, Debuggers, Linux.

Objectives of the project: To understand the process of post silicon validation of SoCs, debugging issues, root cause analysis and automate the process using scripts.

Major learning outcomes: Learnt about debugging hardware issues, various steps involved in validation and use of python and shell scripts in automation.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: It was a very healthy working environment here at QUALCOMM and very beneficial for those starting their careers. People are very encouraging and there are lot of learning and networking opportunities. we get a lot of hands on experience and understanding by the end of the internship.

Academic courses relevant to the project: Vlsi design, CAD for IC design.

Name: VANSI JAIN (2020H1230167G)

Student write-up

PS-II project title: Semiconductor Memories and SRAM Memory Architecture

Short summary of work done during PS-II: In PS2, I did scripting in python. The project that they give is to automate the power stimulus generation . This work is done by company before manually, now my job was to automate the task. This project helps to determine three different types of power in memories. Work involved was to observed the pattern in previously generated file, automate the files and then check results deviation from original ones.

Tool used (Development tools - H/w, S/w): Linux, Python.

Objectives of the project: Objective of this project is to automate the generation of power stimulus files.

Major learning outcomes: Project helped me to improve Python and gave me an understanding of Qualcomm memories.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: My half of internship was work from home, and other half is in hybrid mode. Both of the modes has its own advantages and I enjoyed both of them. Environment in the company is very good and my team is also great. I enjoyed working with them.

Academic courses relevant to the project: CAD for IC design.

Name: AKSHAY MURALI DAS (2020H1230180G)

Student write-up

PS-II project title: CGC Power extraction of GPU

Short summary of work done during PS-II: Understand CGC power estimation methodology and compare power analysis of different GPU projects. Ramp up of clock controller architecture RTL.

Tool used (Development tools - H/w, S/w): verilog, ptpx, veloce.

Objectives of the project: Understand CGC power estimation methodology and compare power analysis of different GPU projects.

Major learning outcomes: Understanding power aspects and tools used for power analysis.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good learning curve and great place to work.

Academic courses relevant to the project: VLSI design.

Name: SHUBHAM BANSAL (2020H1230182G)

Student write-up

PS-II project title: SoC Verification Methodologies using UVM and automation using python

Short summary of work done during PS-II: The project has introduced me to many new concepts in the verification methodologies. The overall experience till now has been full of learning. Working in NoC DV team has given me exposure to tool used in debug analysis of the design. I learnt to explore and analyze the design using industry standard tools.

Tool used (Development tools - H/w, S/w): Synopsys VCS, Verdi, ClearCase, Linux.

Objectives of the project: Learning Verification Methodology and Automation.

Major learning outcomes: System Verilog and Python Familiarity.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is pretty good in Qualcomm. Most of the seniors are readily available to help you with the tasks you got stuck in. You will get a lot of learning materials and opportunities here, just manage your time for optimum learning.

Academic courses relevant to the project: Yes, many courses related subject/study was helpful in tackling the hurdles in the industry.

Name: GOPESH SHUKLA (2020H1230234P)

Student write-up

PS-II project title: Function Verification of GPIO and CSR blocks at SoC Level

Short summary of work done during PS-II: Running regressions at IP level and debugging the test cases if failed. Running SoC regressions on the same blocks and debugging. Achieving functional and code coverage by running appropriate tests and tracking other blocks regressions in case of dependencies.

Tool used (Development tools - H/w, S/w): GVIM, VC Formal (Synopsys), Verdi (Synopsys).

Objectives of the project: Verify GPIO and CSR blocks at IP and SoC level and sign-off with 100% functional and code coverage.

Major learning outcomes: Clear Case fundamentals (hands-on), GVIM usage. Debugging of all test cases at core level for errors / bugs. Scripting language- Perl.

System Verilog Assertions, SoC test cases overview. Components of a SoC and the functions associated with them. Regressions at SoC level – overview taken. Analysis of waveforms using Synopsys Verdi. Functional and Toggle coverage.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is very interactive and supportive. It also is very fast paced and one has to adapt to the environment with that pace. Projects undertaken are cutting edge and have a great potential to enhance the skillset. Only expectation from the company is to train freshers to get used to the pace and workload of the company.

Academic courses relevant to the project: Yes (VLSI Design, System Verilog, UVM).

Name: JONNABHATLA VENKATA NAGA SAKETH RAM (2020H1230242P)

Student write-up

PS-II project title: Power rails coverage

Short summary of work done during PS-II: My work part of an initiative by my team. It involved understanding of the Unified Power Format (UPF) and how present day SoCs are designed using HDL languages as well as UPF. Further it involves understanding the power-aware verification flow. The major goal of this project was to understand the tool generated coverage (Native low power coverage) for low power objects, and understand its drawbacks. Thereby writing system verilog testbenches for functional coverage of low power objects especially the power-rails. Hence this project involves a deep understanding of various concepts. This project also involves usage of tools effectively and scripting to automate the tasks. Automation helps in reducing the burden of coding lengthy codes which might be tedious and error prone. Hence we can reduce both the time to design and reduce the probability of errors as well. Overall my experience in SoC DV Multimedia team is overwhelming and involved lot of learning.

Tool used (Development tools - H/w, S/w): VCS NLP, Synopsys Verdi, Python, System Verilog.

Objectives of the project: To enhance the low power objects coverage.

Major learning outcomes: Deep understanding of UPF, System Verilog Assertions and Coverage and idea about power-aware verification flow.

Details of papers / patents: No papers or patents published.

Brief description of working environment, expectations from the company: The work environment at workplace is very good and very much professional. The team and manager are always supporting and are open to talk at any time. We get opportunity to learn a lot and explore various different possible ways to achieve the goal. The expectations from company is to give our full-efforts as much as possible and continuous innovation so that it would be helpful for the company and the individual as well.

Academic courses relevant to the project: VLSI design, CAD for IC design, VLSI test and testability.

Name: SUNIT BEHERA (2020H1230251P)

Student write-up

PS-II project title: Design QA of Security IP / Module

Short summary of work done during PS-II: Clean RTL signoff and delivery in different project milestones. The assurance of quality RTL signoff is ensured by lint checks, clock domain crossing checks, reset domain crossing check, low power intent checks and other miscellaneous company specific checks. All these QA checks are performed to avoid flaw designs and silicon respins.

Tool used (Development tools - H/w, S/w): Synopsis Verdi, Cadence Simbus, Unix, Clearcase, Synopsis Spyglass.

Objectives of the project: To assure clean RTL Signoff in Fronted VLSI Design.

Major learning outcomes: CDC, RDC, Low Power, RTL Design.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment is pretty good and seniors are very friendly and supportive. Qualcomm has a vivid work environment with lots of perks.

Academic courses relevant to the project: VLSI Design, Advance VLSI Design, VLSI Architecture, Reconfigurable Computing, VLSI Test and Testability.

Name: DEETI AKSHAYKUMAR (2020H1230316H)

Student write-up

PS-II project title: Validation of particular IP on SOC

Short summary of work done during PS-II: Validated an IP and performed various tests in different stages in order to check the feature correctness and functionality of the block. Debugged various codes that caused issues during compiling etc.

Tool used (Development tools - H/w, S/w): Lauterbach trace32.

Objectives of the project: Need to validate an IP and check its functionality and correctness using the corresponding testcases.

Major learning outcomes: Learnt how to validate IP and perform different tests and check the functionality of available features.

Details of papers / patents: No papers had been published.

Brief description of working environment, expectations from the company: Work culture in Qualcomm is really good. You can expect help from your peers managers etc. Even if you face an ambiguity or confused about any concept there will be people always around you to help. We used to have a session every week where we discuss with our team about the work we had done in that particular week which promotes a healthy environment for learning. In addition there was a mid assessment which helped to track and guide us to move in the right direction. You would be expected to finish the work within stipulated time and as a fresher you need not panic on seeing this as there would be many to guide you.

Academic courses relevant to the project: VLSI Design, Advance VLSI Design, Digital Electronics, Basic linux commands.

Name: PRERIT DAGA (2020H1230335H)

Student write-up

PS-II project title: DB Checker Script

Short summary of work done during PS-II: Basic training was done on memories and conventions used in Qualcomm. Then Python script was written in phases to automate the database verification and modification. This included reading and updating files, pointing out errors and creating excel reports. Since most files were in PERL, a training on PERL basic was also done.

Tool used (Development tools - H/w, S/w): Linux, Python.

Objectives of the project: To automate Memory Database verification and processing using Python script.

Major learning outcomes: Python scripting, Excel reading & writing using Python, Linux.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good working environment, with flexibility in start and end time of the day. Work can be more sometimes. People with good nature and no micromanagement.

Academic courses relevant to the project: Since my project was on Python, it was not much related to any academic courses directly, but Python used for Lab/Project work in courses (like PMMD and SAT in Video Processing helped VLSI, AVLSI courses were helpful in understanding memory related terms.

Name: CHEPURI VENKATESH (2020H1230346H)

Student write-up

PS-II project title: Formal Verification on different IPs

Short summary of work done during PS-II: Started with learning JasperGold tool for FPV verification. Then I was assigned with FIFO verification. We find an abnormality and filed a BUG JIRA and sorted it out. Later I achieved 100% coverage as well using coverage tool. My next project is to do FPV and CSR for VMIDMT. Started learning VMIDMT and VC formal simultaneously. I found a bug there but it was already filed by another team. Currently halfway through, will sign it off by the end of internship period.

Tool used (Development tools - H/w, S/w): Jasper Gold: FPV, Coverage, CSR. VC_FORMAL, FPV, FRV.

Objectives of the project: Formal Signoff of FIFO and VMIDMT.

Major learning outcomes: Formal methods, tools, debugging, approach for a formal verification engineer.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is professional and educative. Company expects me to properly verify all the IPs as well as to educate other teams with formal tools (Since it is a pretty new to Industry). major aim is to completely replace simulation with formal.

Academic courses relevant to the project: VLSI Test and Testability, RC, VLSI Architecture, VLSI Design.

Name: KRISHNA PRIYA S MUKUNDAN (2020H1240102P)

Student write-up

PS-II project title: 5G DL PHY channel

Short summary of work done during PS-II: TGained Extensive understanding of the significance of the above mentioned downlink signals, its time and frequency resource allocation, contents followed by details of their configuration and decoding performed alongside the learning process.

Tool used (Development tools - H/w, S/w): Sanjole.

Objectives of the project: Test and Debugg 5G DL signals.

Major learning outcomes: Extensive knowledge on the 5G DL channels, their configuration, use cases.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Immensely positive work environment with a tremendous scope for learning and be in line with the latest technology.

Academic courses relevant to the project: Yes

Name: ARUNA (2020H1400220H)

Student write-up

PS-II project title: Automation of Log collection and Analysis in Modem System Testing

Short summary of work done during PS-II: My work on this project included a combination of hardware and software. I began the internship by learning the detailed theoretical concepts related to 4G and 5G communication. Once I was thorough with the concepts I got an opportunity to work with the hardware device i.e. Modem. I was introduced to the various functionalities of the

device and also got to see them myself. Once I gained familiarity with the hardware setup, I was introduced to the software files used to implement the functionalities. I studied the existing files and started working on manually testing the functionality on the device end to end. Over the period of time, I started working on automating the process and started writing my own script files for automation. I spent a large amount of time studying and analyzing the logs generated by the testing. These logs helped me understand the behavior of the device better. This process of going from manually testing to automating the process thought me the benefits of implementing the same process. Hence I can positively say that through my project, I helped the team lower the time spent on manual testing of functional features.

Tool used (Development tools - H/w, S/w): Python, Perl.

Objectives of the project: In the field of Functional Verification, for complex DUTs where the test cases to be verified are large, the process becomes time consuming. Hence there is a need for automation in the process of log collection and analysis.

Major learning outcomes: Over the course of this project, I was able to gain experience in the field of automation. The tool used to implement this process was Python. As a result, I was able to develop my skill of Python scripting as well.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment of the company and the team was very welcoming and inclusive in nature. The team members were very helpful in making me feel at home within the team and also were generous enough to answer all the doubts that I would ask. The expectation of the team and team members was that the task assigned should be completed within the stipulated deadlines.

Academic courses relevant to the project: As the project was based on Communication and automation, the courses Research Practice (RP) and Study In Advance Topics (SAT) and the projects done in these courses were very helpful. Additionally, the course of Device Drivers was also helpful in understanding the concepts.

PS-II Station: Qualcomm India Pvt. Ltd., Hyderabad

Faculty

Name: Gopala Krishna Koneru

Student

Name: SRINIVASAN M P (2016HS400283H)

Student write-up

PS-II project title: Optimization of Rock Bottom Sleep Current in AR/VR chipsets

Short summary of work done during PS-II: I worked in putting various subsystems inside the chip to RBSC/Sleep and finding the power-consuming subsystems and optimizing their performance. I learned about the various subsystems inside Qualcomm's chip and how they communicate with each other. I learned Linux Shell and various tracing tools in the Linux Framework. I also learned JTAG based debugging. The power consumption and performance is very important, I proposed new methods to optimize power consumption in various use case scenarios.

Tool used (Development tools - H/w, S/w): T32, JTAG, Linux Tracing tools and other internal proprietary tools.

Objectives of the project: To propose an optimal solution meeting the power and performance goals of the chip in its Sleep State (RBSC).

Major learning outcomes: I learnt about the various subsystems inside Qualcomm's chip and how they communicate with each other. Learned Linux Shell and various tracing tools in the Linux Framework. I also learned JTAG based debugging and other internal proprietary tools.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: The people in my team were very kind and helpful.

Academic courses relevant to the project: Real Time Systems, Embedded Systems Design, Device Drivers, Power Electronics, Computer Architecture, VLSI Architecture, Advanced VLSI Architecture, C Programming.

Name: SAMAKSH TANDON (2020H1030051G)

Student write-up

PS-II project title: Generating stability scenarios for AI

Short summary of work done during PS-II: Wrote a python script which generated configuration files which contained different scenarios. These scenarios were then run on Qualcomm chipsets. We then analysed the results and look into scenarios causing stability issue. Example of a scenario is running two different applications simultaneously both using different ML algorithms.

Tool used (Development tools - H/w, S/w): Python, html, shell script, Qualcomm internal tools.

Objectives of the project: To stress test Qualcomm chipsets by generating possible scenarios that might cause stability issue in the device.

Major learning outcomes: Python automation.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Working culture at the company was good. Team members were helpful. Timings were flexible. The only expectation is to complete the given task.

Academic courses relevant to the project: Yes.

Name: KASHISH (2020H1030052G)

Student Write-up

PS-II project title: Audio DSP and Calibration Manager

Short summary of work done during PS-II: Build 2 Python scripts: one to manage hardware availability among the team and other to automate the code modifications. Also, worked on adding data logging module in low power mode.

Tool used (Development tools - H/w, S/w): Idle, Visual studio, internal tools.

Objectives of the project: ADCM is a Windows Audio driver meant for Qualcomm proprietary Hexagon DSP processor. ADCM driver communicates on one end to Audio Miniport driver which in turn talks to Microsoft Audio port class driver and at other end talk to DSP processor.

Major learning outcomes: Learnt how to automate tasks using python and also learnt to understand the code from documentation.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very nice working environment, helping team members who guided me throughout the internship.

Academic courses relevant to the project: C language, Python language.

Name: THOUTREDDY SRINANDINI REDDY (2020H1030115H)

Student write-up

PS-II project title: Memory analysis

Short summary of work done during PS-II: Memory optimization is a combination of techniques to improve memory by identifying memory leaks, optimizing the memory usage so that the performance of the system will be improved. Using too much of memory may sometimes lead to running out of the memory. Releasing new versions of products with added functionalities may sometimes occupy more memory and may lead to the deterioration of the performance and results of performance may not be as expected. So identifying the most critical points that are occupying more memory and optimizing the memory usage is the kind of work I do in Qualcomm.

Tool used (Development tools - H/w, S/w): Python, Qualcomm Internal tool.

Objectives of the project: Objective is to identify the memory occupied by complex data structures.

Major learning outcomes: Understood the functioning of the tools used by QUALCOMM for memory analysis. Understood the process of implementing the logic to retrieve the memory usage of one of the data structure and its member.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company:

Academic courses relevant to the project: Data structures, Operating systems.

Name: SHUBHAM MISHRA (2020H1030132H)

Student write-up

PS-II project title: 1. Parser construction 2. Automation exercise

Short summary of work done during PS-II: Did numerous automations and tool implementation in my team.

Tool used (Development tools - H/w, S/w): Idle, Python, internal tools of Qualcomm.

Objectives of the project: 1. Create a parser to parse specific files for a certain product 2. Automation for various chipset.

Major learning outcomes: Learnt how to create industrial applicable scripts and how to update them via requirement.

Details of papers / patents: Not applicable

Brief description of working environment, expectations from the company: Good working environment. Helpful mentors and teammates.

Academic courses relevant to the project: Most of the courses were relevant to the projects I did.

Name: SAYAN DEY (2020H1120273P)

Student write-up

PS-II project title: Linux Kernel Software

Short summary of work done during PS-II: The work done during PS-2 involves, understanding the underlying SoC architecture, development life cycle, module loading and many others. Have dealt with many of the kernel issues for chips already in production and also learning the

development of components and drivers used in each and every development stages. Got to learn the organization behaviour, company's code of conduct and exposure to cutting edge technologies.

Tool used (Development tools - H/w, S/w): MS Teams, outlook, putty, jira, versioning tools, hardware emulator.

Objectives of the project: To understand the development life cycle of kernel given the current stage of the project. Tackle the issues faced during development and release of chipsets and get a gross understanding to incur more inputs to upcoming set of hardware.

Major learning outcomes: 1. Company's coding standards 2. Kernel Architecture and workflow 3. Chipsets development lifecycle 4. Presentation skills, Organizational behaviour, documentation 5. Regressive pair debugging.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is very transparent in my team. Seniors of every hierarchy are Directly approachable and are open to solve any of your queries. Working setup is good and also convenient to make the employee feel comfortable during working hours.

Academic courses relevant to the project: Yes, especially subjects related to Operating system and Computer Architecture.

Name: TEJASVA SINGH (2020H1120280P)

Student write-up

PS-II project title: Automation of Dataset Release Process

Short summary of work done during PS-II: My tasks have included – • Learnt how the Qualcomm Ultrasonic sensor works. • Learnt about the tasks performed by the Database Systems Team. • Performing small bug fixings in the existing projects. • Working on some new R&D and analysis tasks. • Learnt the manual process of dataset release. • Automating the dataset release process.

Tool used (Development tools - H/w, S/w): Python, C#, Visual Studio, AWS, VMs, Linux Harvester, Qualcomm Proprietary tools.

Objectives of the project: Reduce the time and effort required in dataset release.

Major learning outcomes: I learnt how the Qualcomm Ultrasonic sensor works and about the tasks performed by the Database Systems Team and also understood the process of dataset release.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is great, managers and teammates are very friendly and supportive. Proper guidance is provided at every step.

Academic courses relevant to the project: Yes.

Name: PAPAI GHOSH (2020H1120289P)

Student write-up

PS-II project title: Building Automated Test scripts for Sysmon app

Short summary of work done during PS-II: Earlier the performance stats were generated from the command prompt by writing sysMon command. So now by automating the test cases through plugin script, it validates the result of the commands and generates a report where test results

including the performance stats and logs are shown. This makes things lot easier as you don't need to run any command to fetch performance stats, just submit the automated test case attached to the job and it will show all the details and generates successful/unsuccessful message based on the verification of the result.

Tool used (Development tools - H/w, S/w): AXIOM.

Objectives of the project: Automating all the features which provide performance stats of DSP processor through plugin script.

Major learning outcomes: As part of the automating test case for sysMon app, the learning include introducing new feature through script, easy handle of fetching performance report, validation of all the stats in the report, all while following a clean code paradigm.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The environment was very approachable and friendly. Whenever I faced doubt, I always got help from my teammates. All are very supportive and motivates me to do better.

Academic courses relevant to the project: Programming fundamentals, Data structure.

Name: ANSA AHMED (2020H1120303P)

Student Write-up

PS-II project title: Power Management IC Tool Development - QXDM PMIC Dashboard

Short summary of work done during PS-II: The architecture of the SoC is laid out in such a way that the power management ICs manage power distribution and regulation as part of input, output, user interface and housekeeping functionalities for the chipset. The components and the peripherals attached to the Mobile Station Modem require it to operate over a certain voltage and

current, which can be understood through a power grid of every chipset architecture. Power management ICs facilitate the distribution and regulation of the source voltage and current coming from external wall charger or battery to the LDOs and SMPSs in every module. To diagnose these we need logs of the PMICs and data traveling over the bus communicating between the MSM and PMICs. Apart from this we can also view the clock status, power rails status, GPIO information, PMIC information. Thus a tool is needed to be able to perform such functionalities for the PMIC.

Tool used (Development tools - H/w, S/w): PMIC Tools, PMIC and SoC architecture based tools (internal QC Server), T32 Debugging, MSM + Debugging hardware, Linux, Axiom, PMIC internal APIs, Communication APIs between frontend and driver codes, Putty, MobaXterm, VSCode.

Objectives of the project: The project is aimed at developing a tool for PMIC based tool / functionalities which acts as an alternative for various functionalities used by the PMIC Team like dump collection, register data read/write etc. But this tool works without the dependency of others.

Major learning outcomes: • There are different functionalities that the tool can be used to operate with PMICs such as:

- Reading values stored by the peripheral registers
- Writing values to the peripheral registers
- Collecting PMIC dumps
- Interacting with the GPIOs
- Interacting with the clocks
- The existing scripts lay down how to implement these PMIC Functionalities, using them and altering them to our own use case we can write the driver APIs for these functionalities.
- the driver codes for every functionality of the tool has to be written in a definite structure consisting of
 - Handler APIs
 - Logger APIs
- The interface between the PMIC Hardware and the backend driver codes is the common BUS and we create a memory buffer to capture this data.

- The interface between the frontend and the driver code is using this memory buffer. The frontend parses this response pointer pointing to the memory buffer and displays the data after read using it's APIs.
- The BITMAP data structure can be used to store the presence of different peripherals attached to the PMICs, it comes in handy to detect the presence of a peripheral
- In order to return PMIC related data as response need the following according to use case
 - count of the number of peripherals attached to every PMIC
 - Size of the FIFO consisting of BUS transactions

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment at Qualcomm was thriving and nurturing for those who are willing to learn. People may be skeptical of practicing a software role in a company which is known for it's hardware. But the projects assigned help you to not just used what you know as a software developer but also come out of the box and understand the use case of the hardware they have been given to interact with. My peers helped me understand and were patient whenever I had any doubts.

Academic courses relevant to the project: Yes academic courses like the following were relevant to understanding the concepts used in the project: Software for Embedded Systems, Operating Systems, Computer Architecture, Software Architecture

Name: AJEET SINGH (2020H1230339H)

Student write-up

PS-II project title: Verification Of Automobile SOCs

Short summary of work done during PS-II: Mostly the work and project was based to improve the technology aspects of the integrated SOCs used in the Automobile unit. Project was mainly based on automobile SOCs used in various advanced car. Our team had the RTL design, we just

had to develop the testcases and run it to check the functionality of the design whether every blocks is working fine or not and guided the design team regarding the issues in the design.

Tool used (Development tools - H/w, S/w): Linux, QSAM, Verdi.

Objectives of the project: Objective of the project to generate and develop testcases to verify the SOC that is integrated to check its functionality and code coverage.

Major learning outcomes: 1.Trainings 2.Understanding of the project 3.Running testcases and debugging it 4. Checking the functional code coverage.

Details of papers / patents: Project was mainly based on Automobile SOCs used in various advanced car. Our team had the RTL design ,we just had to develop the testcases and run it to check the functionality of the design whether every blocks is working fine or not.

Brief description of working environment, expectations from the company: It was a great experience, learning about the industry aspects of the design.

Academic courses relevant to the project: Yes

Name: PILLALAMARRI ROJA (2020H1240080H)

Student write-up

PS-II project title: MODEM RF Air Interfaces

Short summary of work done during PS-II: Acquired good exposure and understanding to Qualcomm's internal tools / sites. I learnt about the LTE Protocol stack framework and supported it by resolving the issues reported.

Tool used (Development tools - H/w, S/w): Perforce, SourceInsight, Araxis merge, T32, code collaborator and Qualcomm proprietary tools.

Objectives of the project: To make the LTE protocol stack work more efficiently while transmitting and receiving.

Major learning outcomes: Various aspects of LTE have been studied theoretically in depth and its corresponding code implementation of protocols which helped gained in-sight to tackle the customer request raised for de-bugging from physical layer perspective.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Qualcomm is an inspiring and inclusive workplace. Despite the fact that the majority of my work was done online or in a hybrid environment, right from the onboarding my team really helped me every time I need their help. I would expect and would like to be part of development towards the leading-edge technologies.

Academic courses relevant to the project: Courses like advance digital communications, RF micro electronics really helped during the project work.

Name: SHRUTI VERMA (2020H1240091H)

Student write-up

PS-II project title: Visual Representation of logs

Short summary of work done during PS-II: The intern project was to create a better visual representation of the logs collected for easier debugging. Was introduced to the project I will be working on, learnt the architecture and design, and the workflow. Started with small project related tasks.

Tool used (Development tools - H/w, S/w): C, C++, Python.

Objectives of the project: The logging of data was to be streamlined for ease of debugging, such that with easier representation issues can be debugged in a faster and easier way.

Major learning outcomes: Complete 5G architecture, the tools and software's being used, the workflow of how tasks are done within the company, and the company culture.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: As an intern, we are expected to ramp up on all the tools, technologies required to work within the company. From the company perspective, since all interns are expected to convert to full-time employees, we are not distinguished from them, and are handed the same work which is to be carry forwarded as full time employees. The work environment has been nourishing as everyone is ready to help and explain concepts. Some amount of basics is expected to be known as the work directly jumps into core fields of electronics, hence a good grasp of basic concepts is a must.

Academic courses relevant to the project: Yes. Courses like Advanced Digital Communication Systems and Wireless Communication are core to be able to continue working in Qualcomm.

Name: K SRINIVASAN (2020H1240101P)

Student write-up

PS-II project title: RF Software Design for Value Tier Chipsets

Short summary of work done during PS-II: I was involved in the design of Device Drivers for the RF Front End components of Qualcomm's value tier chipsets, to aid in reception of 5G signals & also worked on scripts for different debug enhancements.

Tool used (Development tools - H/w, S/w): C/C++ language, Python, Source Insight, Qualcomm proprietary tools used for different tests involved in 5G cellular communication.

Objectives of the project: Development of device drivers for controlling RF Front End components of Qualcomm's value tier chipsets for delivering 5G solutions.

Major learning outcomes: Learnt about 5G Physical Layer, RF Device Driver development, Tests and tools used for validating and characterizing different flows in cellular communication.

Details of papers / patents: Work done during the course of PS was proprietary to the Qualcomm, there are no plans for a paper/patent at the moment.

Brief description of working environment, expectations from the company: The working environment was very good. My superiors and other team members helped me out a lot during the initial learning phase and guided me while I worked on different tasks during the course of the internship.

Academic courses relevant to the project: Advanced DSP, RF Microelectronics, Advanced Digital Communication, Mobile and Personal Communication, Applied Estimation Theory.

Name: ABHILASH KUMAR PANDEY (2020H1240112P)

Student write-up

PS-II project title: Transceiver RF-SW Device Driver Development

Short summary of work done during PS-II: Mostly work on the software code of design of the new chip which will be launched. Firstly got to know the high level design then worked on small parts taking one module at a time.

Tool used (Development tools - H/w, S/w): Pycharm, Perforce, Source insight.

Objectives of the project: To work on software design of new chip.

Major learning outcomes: Got to know how RF card chip software design happens , what is the flow and how at granular level the software part of chip works.

Details of papers / patents: Not able to work on patents.

Brief description of working environment, expectations from the company: Working environment is very good and supportive, work is also very engaging, lots of learning opportunities.

Academic courses relevant to the project: Yes

Name: HARSHIT AGGARWAL (2020H1400106G)

Student write-up

PS-II project title: AudioReach® SPF Test Framework Stabilization and Issues Support

Short summary of work done during PS-II: To monitor the AudioReach® SPF (Signal Processing Framework) test framework nightly failures. To debug and resolve the failed test cases in the test framework. To write new test cases or edit the existing ones, as per required to get failures fixed. To support for issues reported in audio/voice by the APT, Stability, and customer testing teams. To work on the nightly failures assigned to me, i.e., to check failures in the test cases in the test space which are ran each day to check the health of the system. To get high level ramp up of the framework, interfaces, modules in the project.

Tool used (Development tools - H/w, S/w): Qualcomm Audio Calibration Tool, QXDM, Apex, Audacity Perforce, Log Parcer.

Objectives of the project: My team has developed a signal processing framework named the AudioReach® SPF. I monitored the AudioReach® SPF Test space and supported the issues. The AudioReach® SPF Test space monitors the build's health, which has thousands of daily tests to incorporate.

Major learning outcomes: I worked on resolving 60+ test cases that were assigned to me. We have an internal JIRA for issues monitoring internally within the team. I solved multiple JIRA issues given to me by my mentor. These issues can be reported to us by the APT team, system testing teams or direct customer testing teams.

Details of papers / patents: Didn't published any.

Brief description of working environment, expectations from the company: Working was pretty normal. Deadlines and syncups were setup everyday for the quick and efficient flow of the work.

Academic courses relevant to the project: Embedded system design.

Name: ABHINAV PARIHAR (2020H1400183P)

Student write-up

PS-II project title: FastRPC and Plugin for dumps tool

Short summary of work done during PS-II: Understanding how the whole FastRPC offloading framework works. Understanding all the modules which are involved on both the ARM and DSP sides. The next step was to learn c# and design a plugin for one of the Qualcomm's proprietary software. This plugin is responsible for getting ramdumps from different targets and then analyse those dumps to generate several debugging reports. These reports are used to help our team debug issues and problems discovered internally and ones which are reported by our clients. The feedback on how the reports should look like and things which can be included in the report to make debugging more simplified were discussed with every member of the team in weekly meetings.

Tool used (Development tools - H/w, S/w): Microsoft visual pro, Qualcomm proprietary tools, Ramdumps collecting tools, VMware, vnc, putty, c#, embedded c, Trace 32, grok, various targets for testing.

Objectives of the project: To understand FastRPC and develop a plugin tool to analyse ramdumps and give debugging reports.

Major learning outcomes: Understanding how ARM and DSP work and coordinate with each other, Understanding ram dumps, How things are divided into secured and non secured content in both arm and dsp, hypevisors and trustzines, How to coordinate with the team, Coordinating with fellow employees in different timezones.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Working environment is really cooperative. Everyone works as a group and ready to help each other if asked. Proper verticals are established within the team so the issues one has can be redirected properly. Daily and weekly meetings are scheduled according to the tasks one has and also monthly 1:1 interactions are there with manager to discuss anything apart from company matters which the team can help in. The tasks at the time of assignment are divided into sub tasks with each sub tasks organised into time sprints. This really helps in keeping track of things and helping in keeping up with the timelines. The expectation from the company increases with increase in your time with the company. There are no unrealistic expectations from the beginnning. Everyone gets time to get acquainted to the team and have proper ramp up materials. After the ramp-up few minor tasks are given to get acquainted with the system and then the work begins according to the tasks assigned or redirected to you.

Academic courses relevant to the project: Embedded System, Device Drivers.

PS-II Station: Ramboll India Pvt. Ltd., Gurugram

Faculty

Name: Mahesh K Hamirwasia

Student

Name: AUJASVI BABBAR (2020H1300065H)

Student write-up

PS-II project title: Geometric design of roads, novapoint and infra bim coding

Short summary of work done during PS-II: My PS @ Ramboll had different phases: 1) Dummy Project to Upgrade skills in Civil 3D based on the IRC Standards. 2) Second project was to get familiar with Novapoint and road modelling in it along with AutoCAD 2D. Getting accustomed with Detailed road pavement, road surfaces, pavement surfaces etc. and other useful functions in Novapoint. 3) Involvement in 3 Finland Projects, understanding building smart concept through Infra BIM. Also, responsible for setting out Infra BIM coding for road model layers extracted from Novapoint and verifying formation of Cross sections in 3D Win software with Typical cross sections.

Tool used (Development tools - H/w, S/w): AutoCAD 2D, AutoCAD Civil 3D, Novapoint 21.00, 3D Win, MS Excel, MS Word and MS Powerpoint.

Objectives of the project: To set the final deliverables to be executed on site using the Infra BIM manual and coding of the layers for the road models.

Major learning outcomes: (1) Exposure to the business and work culture of global design centers.

(2) Gained proficiency in major CAD & BIM tools used in the highway design profession.

(3) Gained clarity on how design fundamentals and design codes are applied in real world projects thanks to hands-on experience.

(4) Getting exposure to the new highway design software like Novapoint and 3D win which are predominant in Norway and Finland projects.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: To the best of my knowledge, the company expects: (1) Familiarity with AutoCAD civil 3D & decent proficiency in AutoCAD 2D (preference for commands over use of GUI): As 90% of the time one uses these software on the job for design tasks.

(2) Capability to gain a working knowledge of a country's highway design standards in 2-3 weeks as Global Design Centers (GDCs) work on many different country's projects (Norway, Finland, UK, Middle East, Sweden etc.).

(3) Fluency in fundamentals of highway design which is required for (2) as mentioned above: It is expected that candidates will pickup necessary & additional theoretical knowledge independently.

Academic courses relevant to the project: (1) Highway Geometric Design (for design projects & junction modelling) & (2) Pavement analysis and Design (for Understanding pavement structure).

Name: PARTHA KHASKIL (2020H1300089P)

Student write-up

PS-II project title: Geometric Design of Swedish Roads

Short summary of work done during PS-II: Geometric Design of Roads using Civil 3D, Understanding the guidelines and standard codal practice required for projects. Analyzing the Survey Map data for understanding terrain conditions and designing the geometric elements required according to project specifications.

Tool used (Development tools - H/w, S/w): Civil 3D, Naviate, AutoCAD, ProjectWise.

Objectives of the project: Scope involves preparation of detailed design for Tegelbruksvägen, connecting roads, Junctions, and a roundabout. Tegelbruksvägen is 0.598 km long and includes 10 road pockets, 2 bus stops and involves production of drawings as well as checking slopes.

Major learning outcomes: Geometric Design of Highways, Corridor Modelling, Superelevation & Road Widening Scheme, Grading, Elevation Plan, Swept Path Analysis. Preparation of Road Marking Plans & Traffic Sign design.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The Gurgaon Office is the Ramboll Engineering Centre of Ramboll. The Company follows a highly professional and work life balance culture. A Manager (Team Lead) is assigned to each intern. Each intern is allotted country specific teams. The team mates and Senior Engineers are very helpful in guiding, sharing their professional experiences and supervising work allotted to interns.

Academic courses relevant to the project: Highway Geometric Design, Pavement Analysis & Design, Traffic Engineering & Safety.

Name: PATIL RAHUL LAXMAN (2020H1430076P)

Student write-up

PS-II project title: Several different projects

Short summary of work done during PS-II: Done modelling, some checking for designed components like slab, development studies like preparing excel sheets according to Eurocode provisions.

Tool used (Development tools - H/w, S/w): Software like Revit, AutoCAD, ETABS, SAFE, RAM-Concept.

Objectives of the project: Modelling and Designing.

Major learning outcomes: Modelling, Designing.

Details of papers / patents: Not any

Brief description of working environment, expectations from the company: Good positive culture.

Academic courses relevant to the project: Almost all

Name: SWATHI P (2020H1440045P)

Student write-up

PS-II project title: Development with sustainability

Short summary of work done during PS-II: In DDC, we do automation process. At first we collect requirements from client and find solution for the problem and then the software or the plugin will be developed for the appropriate problem.

Tool used (Development tools - H/w, S/w): Computational design, C#.

Objectives of the project: To make environment sustainable by reducing carbon from building and transport.

Major learning outcomes: Development, new software, automation.

Details of papers / patents: Developed carbon calculator.

Brief description of working environment, expectations from the company: Best working environment we can find in DDC, Ramboll. No work-stress or pressure will be faced.

Academic courses relevant to the project: Yeah, multi-criteria, Infrastructure etc. But still I think we should work on Novapoint, Civil 3D softwares.

PS-II Station: Ramco Steels Pvt. Ltd., Faridabad

Faculty

Name: Sudeep Kumar Pradhan

Student

Name: PRATYUSH PRANAV UPADHYAY (2020H1410099G)

Student write-up

PS-II project title: Reduction of setting time of cnc machine and rejection analysis

Short summary of work done during PS-II: Objective and scope of project Our main objective is to reduce the setting time and reduced the rejection of floor during marching setting setting process is sub divided into various process, like quality checking, jaw assembly and disassembly, jaw and tool searching, gauge searching, tool offset setting, jaw cutting and program feeding in which some of the process is time consuming and their need to reduced the time of this process. Firstly, we have target some of process and try to reduced the time taken by each process so that the setting is to be reduced Jaw and tool searching: - we firstly observed problem associated with this process due to that time consuming. After observation we come to conclusion that the jaw and tool are not properly segregated and placed so that time taken for searching is more. So, we used simple segregation method to segregated the jaws, we modified our present rack and made different chamber for id and od clamping and also, we segregated on the basis of size like 6",8",10" and for special jaws and also, we provided different rack for special jaws, than we again modified the rack in plywood which is better in visual and easy to segregate and reach, by using this simple method we can save 20 min and 64 thousand in each floor per year Jaw assembly and disassembly: - we observed the process and we come to conclusion that the time taking in manual tightening of jaws assembly and disassembly is more so we covert manual tightening to

tightening using torque wrench. Which is easy to use and time taken to complete this process is also low compared to manual tightening. By using this we can able to save 10 min time during each setting and 1.4 lakh rupees per block

Checklist: - this simple technique that we are used in floor. We provided checklist to setter and suggested to used before setting by using this setter are able to know in advanced that which setting equipment need to search pr arranged and which available in floor, suggestion is given to setter that they start searching 20 min before setting, which directly help to reduced setting time.

Rejection: Rejection in floor due to od under sized. Id over sized, tapered in length, length under sized, dent and scratch due to chip is very common and main reason for that rejection is chip stuck in jaws, chip not breaking, improper tool offsetting and tool brokage or insert brokage we have targeted some of causes and try to reduced the rejection

Chip stuck in jaws: - rejection due to chip stuck in jaw is more frequent in machining process. This is happened when operator forgot to clean jaws or due to improper cleaning jaws after each machining. To prevent this effect, we provide automatic air blower to the CNC. With the help of maintenance team, we setup this instrument which blow air in jaws for 6 sec during d clamping of product so that rejection occur due to chip stuck is prevented. It also helps reduced rejection due to chip stuck

Length under sized and thread cutting : - rejection occur in some of rspl due to length under sized, due to no gauge available in roughing process due to that more length is cut in roughing which is not detected due to lack of gauge, and rejection occur in finishing during quality check, so we need to make gauge for that we make snap gauge gauge for roughing and finishing process, due to that we are easy to detect length variation in during machining process which can easily check by operator, so that rejection occur is prevented, for some rspl quality checking team don't know which type of thread is present in product so that rejection occurred in setting product due to improper information in TDS sheet, so we have updated TDS sheet so that rejection occur in that is to be reduced.

Tool used (Development tools - H/w, S/w): SPC, 7 QUALITY CONTROLE TOOLS, EXCEL.

Objectives of the project: Our main objective is to reduce the setting time and reduced the rejection of floor during marching which significantly increases the production and improves the quality of products so that the profit of the company get enhanced.

Major learning outcomes: First project i.e setting time reduction - This reduces lead time of setting another parts in CNC or VMC as a result number of setting per day is increased and hence more number of production is achieved which leads more profit to the organization.

Second project i.e Rejection analysis - This reduces the unnecessary rejection during production which leads to unnecessary wastage or loss of company reputation or accumulation as a result this project save company from losses and maintain strong relationship with domestic and global suppliers.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working culture is good, all the member in team as well in the company are supportive always help to get some new ideas which help to organization as well in our project. Help in each part of the project from getting material to give into final product.

Academic courses relevant to the project: Yes some of the course like material tool and testing, manufacturing technology and fracture mechanics.

PS-II Station: Resolvity Inc., Texas

Faculty

Name: Monali Tushar Mavani

Student

Name: VIVEK ARORA (2018A7PS1016G)

Student write-up

PS-II project title: Software Engineering Internship (Supporting Ongoing Operations)

Short summary of work done during PS-II: From my PS station, I have learnt a variety of things from the most basic things like professional behaviour and writing production-grade code to a fundamental understanding of a startup's work and scale. I was able to learn how a company plans and designs a solution to a problem and how issues on existing problems are approached. More importantly, I also learnt how to coordinate and express my ideas in a professional setting. I learned how to condense an open-ended problem through the NER platform work and then researched tools and tech to solve the problem. I learnt how to make assumptions and then verify them with the data provided. A huge part of ML development requires learning to implement code from research papers. I learnt how to understand scientific research papers and then implement that methodology into code from the tokenization and labelling scripts. I learnt how code can be optimized and improved. I was able to learn how to set up VM on Azure Cloud Platform and then set up a server for annotating the data. Through the ASR project, I was able to understand what kind of data is needed before approaching a problem and how to condense a larger problem into smaller versions. I learnt in-depth how my school learnings correlated with actual development work being done. I loved that I could understand real-life scenarios and work on new research domains while learning software development.

Tool used (Development tools - H/w, S/w): Python Scripting , Machine Learning.

Objectives of the project: Work at Resolvity has mostly involved working on improving existing functionality or adding new features and support for existing products. I worked on adding support for multiple new languages and helping build a NER Platform for call centre agents.

Major learning outcomes: From my PS station, I have learnt a variety of things from the most basic things like professional behaviour and writing production-grade code to a fundamental understanding of a startup's work and scale. I was able to learn how a company plans and designs a solution to a problem and how issues on existing problems are approached. More importantly, I also learned how to coordinate and express my ideas in a professional setting. I learned how to condense an open-ended problem through the NER platform work and then researched tools and tech to solve the problem. I learnt how to make assumptions and then verify them with the data provided. A huge part of ML development requires learning to implement code from research papers. I learnt how to understand scientific research papers and then implement that methodology into code from the tokenization and labelling scripts. I learnt how code can be optimized and improved. I was able to learn how to set up VM on Azure Cloud Platform and then

set up a server for annotating the data. Through the ASR project, I was able to understand what kind of data is needed before approaching a problem and how to condense a larger problem into smaller versions. I learnt in-depth how my school learnings correlated with actual development work being done. I loved that I could understand real-life scenarios and work on new research domains while learning software development.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Data Preprocessing for Machine Learning Model Training, Adding new features to existing products and Building a new product for a newly designed use case. Majorly work on improving the existing products provided by Resolvity.

Academic courses relevant to the project: Machine Learning, Artificial Intelligence, DBMS.

PS-II Station: Rupeek Fintech (Non-Tech), Bengaluru

Faculty

Name: Sandeep Kayastha

Student

Name: KHANDELWAL HARSH RAJKUMAR (2017B1A20449P)

Student write-up

PS-II project title: Brand Marketing Analytics

Short summary of work done during PS-II: After working with the brand marketing team, all the recommendations were collated and discussed with the senior Business Analyst and the Manager along with all the managers and other stakeholders involved. Based on the suggestions and feedback received from them, efforts are being made to drive and implement those recommendations as quickly as possible. Currently, the errors committed in the implementation in the previous campaigns are being ironed out to ensure efficient campaigns hereafter.

Tool used (Development tools - H/w, S/w): Excel, SQL, Tableau.

Objectives of the project: The aim was to figure out the attrition rates at various stages of the customer journey and classify them according to the channel they were acquired through. The Brand Marketing team works on communication pieces, both internal and external.

Major learning outcomes: Communications consistency scoring and auditing, Project Management for internal communications, Outdoor media plans, NPS consistency methodologies

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working culture is good, all the members in team as well in the company are supportive always help to get some new ideas.

Academic courses relevant to the project: No

Name: DANTULURI SRI SAI SRUTHI (2017B2A11695H)

Student write-up

PS-II project title: Acquisition of new customers through various campaigns to analyse the funnel and improve the product

Short summary of work done during PS-II: My work has majorly been on developing their product- Rupeek PRIME Card- India's 1st Gold Powered Card. I started off with calling few customers to know if the product interests them or not and also power users to understand what made them take our card. This gave me an understanding of user behaviour. Then I went on to create various campaigns and A/B tests to target few customers and check their pulse on what interests them. Now with the data and results, I had to analyze the funnel and report it to my team. We would then sit and ideate new solutions to improve the product. Overall it was an amazing experience as I got to learn various things from understanding user behavior to learning SQL, Tableau, etc to dig deep into analytics.

Tool used (Development tools - H/w, S/w): CleverTap, WebFlow, CustomerGLU, Karix, Airtel, Tableau, SQL, EXCEL.

Objectives of the project: To create various campaigns to understand user behaviour and analyze the funnel in order to improve the product.

Major learning outcomes: • The major technological tools I used as a part of my work were Google sheets, Google Docs, CleverTap and WebFlow.

- In google sheets, I learnt various advanced excel techniques – Macros- VBA, VLook up-which helps extract data from one table to another.
- In Clever Tap, I learnt how to create Campaigns through push notifications, In-app Push notifications and further I will be exploring how to create journeys.
- WebFlow is a NO-CODE tool for Landing pages, I learnt that and made a Landing page for our PRIME card.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work environment has been great. Majorly it was work from home but the whole team has always been warm and welcoming. Most important part was I was given the freedom to make mistakes and then learn from them. I was given complete sense of ownership which is a major reason I have learnt various things and expanded my bandwidth.

Academic courses relevant to the project: Negotiation skills

Name: ASHWIN RAI (2017B2A41309H)

Student write-up

PS-II project title: Expansion and growth in new cities

Short summary of work done during PS-II: Most of my work was ad hoc and was dependent on taking data from database and doing analysis. Presenting the data in a tabular or graphical manner to show which part of the funnel is not performing well and what we can do to improve the performance.

Tool used (Development tools - H/w, S/w): SQL, Tableau, Excel.

Objectives of the project: To track and analyse the performance of various teams in new cities where the product has to be launched.

Major learning outcomes: Team work, Decision making, Data representation.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment was pretty lenient. Enough time was given to finish the assigned tasks. No pressure environment. Only expectations were that the work has to be done with full dedication.

Academic courses relevant to the project: Nil

Name: ADITYA GAYATRI SASTRY KAIPA (2017B2A41648H)

Student write-up

PS-II project title: Growth, acquisition and automation aspects of specific sales channels

Short summary of work done during PS-II: My work at Rupeek was not restricted to one project or task but to fit into the ongoing sales ecosystem and provide value addition to the Sales team and, by extension, to Rupeek. I was assigned to the National Growth Head, Mr Keyur Vohra, who gave me tasks right off the bat to learn the workflow, network across teams and improve my decision-making and communication skills. After settling in, I was assigned to work on the sales team's national DSA vertical to help onboard new DSAs, and liaison with city-level managers and team leads. I was given other short-term projects on the side, including cold mailing big institutions for potential partnerships, finding leads for various kinds of finance agencies, and more. I started a series of small but impactful additions to the sales workflow in March and April. We digitised trivial tasks, eliminated redundancies and made good progress structuring parts of the DSA channel. In the meantime, we also started the DSA Support Team, where I handled communications and managed the Team's WhatsApp presence. We used the Team to understand the pain points of DSAs and introduced programs to reward active DSAs. Post-April, I worked on building Apps Script, Angular and React-based dashboards for DSAs, internal stakeholders and the Sales Teams whose implementation would be carried out after the duration of my practice school.

Tool used (Development tools - H/w, S/w): Google Sheets, Google Suite, Angular and React JS Frameworks, Google Apps Script, Node JS, Materialize and Bulma CSS components.

Objectives of the project: The project was a culmination of several components that aided the ongoing Sales workflow. I sourced leads for some channels, built web-based tools and sought to remove redundancies wherever possible during the practice school.

Major learning outcomes: New Product Development, Design, Improvement in the productivity and efficiency of the overall workflow at Rupeek.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: In short, the company is a fast-paced rapidly expanding start-up that is looking for individuals with lots of enthusiasm and fresh perspective. The ability to adapt and respond quickly in such an

environment will help in laying out a solid learning curve for students and the organization. The scope for learning is endless and if students show good interest and look to take on more responsibilities, the managers would gladly facilitate for the same. What started out as a simple non-tech internship quickly turned into a mixture of product, web development and non-tech work with the support from my team and managers.

Academic courses relevant to the project: None

Name: RAJALAKSHMI C (2017B2A41725H)

Student write-up

PS-II project title: Growth- Operations

Short summary of work done during PS-II: - Helped in taking decisions for demand Pareto by understanding supply. - Analysed on ground realistic supply capacity. - Created a tableau dashboard that helps to track adherence of schedulers and planners for DJ unpromise, DP, and OB and maintain rigour across teams. - Provided visibility to track planners adherence on marking OB and DP in Insight vs Gsheet to achieve uniformity considering teardown depreciation.

Tool used (Development tools - H/w, S/w): Excel, SQL, Tableau desktop.

Objectives of the project: To work with the growth team to identify the KPIs that affect the growth of the company. To improve Slot Utilization (demand) and minimise cancellation of gold loan transactions.

Major learning outcomes: -Software - Excel, SQL, Tableau
-Business functioning (terms, hierarchy, backend processes, client-facing talks) and culture.
-Fluency in writing SQL Queries and MS Excel.
-Extracting desired data and coming up with graphical representations by interpreting the - obtained data.

-Foundry improved public speaking skills, confidence boost and the ability to optimistically face the raw real world.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment was very motivating. The mentor assigned to me was very encouraging and was always open to help. Seniors in the team were very sweet. Work-life balance could have been better.

Academic courses relevant to the project: Nil

Name: SHIRISH GUPTA (2017B4A10778P)

Student write-up

PS-II project title: Direct Selling Agent growth and fraud assessment

Short summary of work done during PS-II: I worked in Sales vertical where end to end ownership of various channels was given. Learnt about the fintech and lending space in India. Sales vertical gave me insights about various channel growth processes and workings. Gathering, refining, assigning and tracking a large amount of customer data and driving results from the data helped me learn about data analysis. Also learnt about product development processes. Interaction with lot of partners.

Tool used (Development tools - H/w, S/w): Redshift, SQL Tableau.

Objectives of the project: Leads and Partner Management.

Major learning outcomes: Learnt about the sales and growth team in the Fintech.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Management was very helpful in learning and project completion. Required tools and training was provided.

Academic courses relevant to the project: Yes.

Name: BHUVESH MITTAL (2017B4A10800P)

Student write-up

PS-II project title: Rupeek Prime Card

Short summary of work done during PS-II: My main work was data-based. Company launched new product i.e, Rupeek Prime card (Gold Based Card) so to ensure proper sales they also started IVR project along with other departments like sales manager, openers. My role was to maintain smooth conduct of this IVR project and also to extract data which was generated through IVR project. Using this data I had to perform some data analysis to ensure that this project is useful and generating customers on regular basis. My project also involved various other analysis of data related to prime card.

Tool used (Development tools - H/w, S/w): SQL, Tableau, Google Sheets, WPS Office, Table Plus, Ameyo, Exotel.

Objectives of the project: To maintain smooth conduct and data for IVR project which helped in selling Rupeek Prime Card.

Major learning outcomes: I learnt about product management, sales, data management and also different softwares.

Details of papers / patents: My PS2 was not research based. It was Finance and Management type of work station, so most of the work was data related.

Brief description of working environment, expectations from the company: Working environment at Rupeek is very nice. I liked the friendly behaviour of my team which I was assigned to. I was given proper guidance about the work assigned to me and work load was properly distributed like they increased our work month by month and by calculated amount so we can also express ourselves and not just invest all our time just doing something without gaining anything from it. So yes I really liked the work environment at Rupeek.

Academic courses relevant to the project: Mathematical Methods, Discrete Mathematics, Logical Operators.

Name: SHUBHAM PODDAR (2017B4A40865P)

Student write-up

PS-II project title: Auction Projection and Market Intelligence

Short summary of work done during PS-II: Major work at my internship included a few major and minor projects such as: 1) Auction Projection- In this project I had to basically build a regression model in excel by using the previous year's data as my base data and predicting the probability of auction based on future transactions. 2) Market Intelligence: In this project I had to oversee a few minor things such as constantly keeping update with the schemes and rates of our competition in market, auditing calls made by agents to our customer in order to better understand customer needs, handling the escalations raised by loan managers and solving them by coordinating with the respective stakeholders. 3) Growth- In this project, I had to assess the data available to us such as the total tonnage of gold and market share of NBFC's in various urban, semi-urban and rural areas to infer our preferable location for expansion.

Tool used (Development tools - H/w, S/w): SQL, MS Excel.

Objectives of the project: The objective of the report was to briefly outline the work conducted by me during my tenure at Rupeek as an intern.

Major learning outcomes: Time-Management, Leadership, Ownership of work, Improving TAT, working in a high pressure high performance environment.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment in this company is similar to any startup- there is a lot of high pressure and the company expects you to match that with high performance. They also expect you to carve your own path in completing your own work and do not interfere a lot. However, this also sometimes backfires as it might take a while for you to get help if you're stuck somewhere.

Academic courses relevant to the project: A few mathematical and economic courses (basic) would be enough.

Name: R SAI SRAVAN KUMAR (2020H1060139G)

Student write-up

PS-II project title: Ops Push, C-SAT, City Escalations and Rupeek Prime management work as an “Intern” for the Central Operations Team at Rupeek Fintech Pvt. Ltd..

Short summary of work done during PS-II: I was part of five projects in the Central Operations team that majorly included in managing and communicating with the city teams and give them data visibility. Also for the project called CSAT and City Escalations I was given freedom to change the existing SOP to a more regularized one. The workflow and the ticket management has been regularized to a more finer version. Also on a daily basis I would check for the tickets raised by the customers in which there was operations dependency and escalate them to the relevant stakeholders.

Tool used (Development tools - H/w, S/w): Google Sheets, Tableau, Google Slides, Google Apps Script, Salesforce TMS.

Objectives of the project: Main objective was to drive the city team to improve the customer experience through operations and take necessary actions if any deviations are occurring.

Major learning outcomes: Advanced Excel techniques, Tableau.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was friendly and supportive. Mentors were highly experienced in their work. Expectations from interns is to learn quickly and start becoming versatile in work to be helpful.

Academic courses relevant to the project: FM

Name: SNEHA SURESH (2020H1490846P)

Student write-up

PS-II project title: Operations / HR intern

Short summary of work done during PS-II: I was initially mapped as operations intern where I needed to take care of the capacity planning as a major task for every month. Since its a gold loan company that delivers gold loans at customers location we need to forecast the demand based on the capacity we have. I moved to bangalore from march and there i worked in the customer experience team and the project manager was so helpful and I literally loved going to office every single day. I later moved to HR department as it was my area of interest where I was given talent acquisition.

Tool used (Development tools - H/w, S/w): Salesforce, google sheets, survey monkey, hirect, naukri, indeed, apna, glassdoor, internshala, google meet.

Objectives of the project: Talent Acquisition

Major learning outcomes: How to hire people, setting up interviews and using various job application sites.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Initially when I worked for the central operations team, people were so helpful and were available even to clarify my silliest doubts. Although it was new and little difficult to understand the formulas people there were so helpful to me.

Academic courses relevant to the project: As an MBA student, the experience from HR team as a talent acquisition intern helped me literally a lot.

PS-II Station: Rupeek Fintech, Bengaluru

Faculty

Name: Sandeep Kayastha

Student

Name: MUSKAN GUPTA (2017B1A30982H)

Student write-up

PS-II project title: Vision Based automation for Kiosk

Short summary of work done during PS-II: Rupeek Fintech is an organization that provides gold loan to its customers. All the processes involved in providing a gold loan can be automated. The visualization of the robotic arm is done using FORMANT. The formant system provides a

platform to visualize the features and system resources in a easy way whether it be graphical representation or bool. Handling the movements of the robotic arm could also be done using this platform using the virtual joystick and buttons. The jewels that are input by the customers are visualized using a RTSP IP camera and the robotic arm movement using URDF module.

Tool used (Development tools - H/w, S/w): Robotic Operating System (ROS), Python, C++, Formant.

Objectives of the project: Building a backend support for handling and observing the Kiosk system.

Major learning outcomes: Working of a kiosk system, visualization of the features of the Kiosk system on formant in order to operate the kiosk device remotely.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The team lead and the reporting manager were always helpful and were easily reachable whenever needed. Team lead and the managers used to conduct the standup meetings everyday and also assigns task and were updated on a daily basis. Apart from the standup meeting with the team, a catchup meeting was organized weekly with the team lead on an individual basis to provide a glimpse of the individual tasks. A month end party was given by the team lead to all the interns in order to boost their confidence. The show and tell of each month was presented by the team to all the team leaders of the company about the work done by them each month.

Academic courses relevant to the project: Python, DSA, C++.

Name: AMEETESH SHARMA (2018A7PS0167H)

Student write-up

PS-II project title: Onboarding two major lenders in the Release process in the lending vertical

Short summary of work done during PS-II: During the start of my PS-2, I was given one week to familiarise with the tools used and got KT of my teams ongoing projects and the codebase. After that another week was spent in learning JAVA, Springboot & mongodb. In the third week, I was given a live project although a small one yet a significant one for me. My mentor helped me a lot to complete that which also boosted my confidence to take up the upcoming projects and handle them myself. In the first quarter itself, I took the ownership of a major project concerning ICICI lender. It took nearly a month to complete. I had to engage a lot with devops and salesforce team to take it live. Apart from that I was also given small tasks like removing deprecated code from their systems and small debugging tasks. In the second quarter my team took up another major project concerning axis bank. I was a part owner of it. This was completed in a very short amount of time. I had to work nearly 10 h a day for a week to complete it. Overall, it was a great experience with a great team.

Tool used (Development tools - H/w, S/w): S/w - JAVA, Springboot, Mongodb, jenkins, Node js, Sails js and Redis database.

Objectives of the project: Deployed various features and updates into production for the lending process.

Major learning outcomes: Learnt a lot of backend tools and most importantly how to write clean code and deploying & testing the project.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: My team was really amazing. They advised me where to improve and supported me whenever required. All in all the experience was really good.

Academic courses relevant to the project: Yes some subjects like oops and dbms were relevant.

Name: ARYAMAN SARMAH (2018A7PS0325G)

Student write-up

PS-II project title: Multiple Platform Team Projects

Short summary of work done during PS-II: During the initial month of my PS-2, I familiarised myself with the members of my team and was given the task to explore and brush up on skills like Python scripting, YAML Configuration and System Administration. After that, I was given a warm-up project in the form of creating the initial frontend of a Spotify Backstage-based App for the developers in the organisation. After that I was given my first major project in the form of creating a large-scale script for migrating the company's users and groups from their former FreeIPA directory to a new Active Directory-hosted directory. I also had to sync up any new users and groups that would be added or deleted from either FreeIPA or Active Directory in the future. I had complete ownership of this project. As a corollary to this major project, I was given the task to develop a parser for the log files generated by the script, which would help make the logs more readable for the developers in charge of debugging. Following from this, I was assigned my second major project in the form of creation of log parsers for multiple tools in the organisation as a part of the larger Spooler project. I had complete ownership of those parsers which were assigned to me. The third and final major project that was assigned to me was to create a Bot for automating Service Desk queries, i.e., giving users access to their desired tools after proper approval based on the Jira tickets created by them. This was a pivotal project since it reduced tool access overhead from 2-5 days to a mere 5 minutes. I had complete ownership of this project as well. Overall it was an enriching experience which would help me in my future career.

Tool used (Development tools - H/w, S/w): Python, Spotify Backstage, Jira, Jenkins, Grafana, Kubernetes, AWS, Keycloak.

Objectives of the project: Reduce access overheads for new employees and employees seeking access to tools.

Major learning outcomes: Python Scripting, Automation Bot Development, YAML Configuration, Active Directory Administration, FreeIPA, Parser Development.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: It was a positive working environment. Since I was the only intern in my team, I received guidance from every member of my team, and they were ready to solve any doubt that I had. I was able to grow tremendously among them and am confident that this will help me in my future career as well. As for the expectations from the company, I was expected to finish all my projects within their specified deadlines and have full ownership over each project that I did.

Academic courses relevant to the project: Data Structures and Algorithms, Computer Networking.

PS-II Station: Rupifi Non-Tech, Bengaluru

Faculty

Name: Sandeep Kayastha

Student

Name: SAYANTAN RAY (2018A2PS0435H)

Student write-up

PS-II project title: Lender movement operations

Short summary of work done during PS-II: Developed a process to help the lender movement program work properly and efficiently. Aligned stakeholders, automation using scripting, and made trackers for proper structuring.

Tool used (Development tools - H/w, S/w): Nil

Objectives of the project: Manage the lender movement program.

Major learning outcomes: Learnt to identify the problems and build the corresponding solutions, how to build a process, learned GAS scripting, Google sheet and excel skill, communication skills, and soft skills.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Working environment is good and all the employees, mentor are very much helpful.

Academic courses relevant to the project: No

Name: SOHAN SADHU (2018A4PS1112P)

Student write-up

PS-II project title: Analytics at B2B Embedded BNPL Fintech Enabler

Short summary of work done during PS-II: My work revolved around improving process efficiency by automating processes using analytical tools. We also created dashboards for data visualisations capturing the summarisations, process efficiency and other important KPIs. As a part of the analytics team we also had to solve ad-hoc requests that came from several internal teams.

Tool used (Development tools - H/w, S/w): SQL, Metabase, Google Sheets, Python.

Objectives of the project: 1. Improve process efficiency by automating processes using analytical tools. 2. Create dashboards for data visualisations capturing the summarisations, process efficiency and other important KPIs.

Major learning outcomes: 1. Business Communication 2. Time Management 3. SQL 4. Metabase 5. Google Sheets.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Rupifi is a fast growing company with highly motivated employees. The company expects its employees to be passionate about work and be ready to upgrade themselves according to the need. Overall, it's a highly motivating and positive workspace.

Academic courses relevant to the project: Artificial Intelligence

Name: GRANDHE MITHUNA SREE (2018A7PS0219H)

Student write-up

PS-II project title: Program Manager

Short summary of work done during PS-II: I was mainly a part of growth team and my main goal was to increase activations and transactions. For improving activations, worked on reducing TAT by streamlining internal processes, working on lender movement, got new leads from the anchor, pushed all the cases stuck in pipeline due to document discrepancies. For increasing transactions, analyzed the transactions data available and made necessary decisions to get the user transacted. I also handled the daily queries that were raised from the anchor's or caller's end. Handled and automated the live drop-off calling process to increase the conversion rate of users getting activated.

Tool used (Development tools - H/w, S/w): SQL, Google sheets, BigQuery.

Objectives of the project: Maintaining and Growing the Portfolios allocated by understanding and analysing the sector, use case, anchor's potential and risk taken. Increasing the activations

by streamlining the processes to reduce TAT, maintain user experience and increase transactions.

Major learning outcomes: SQL, Advanced Excel, Understanding and analysing the Data, Stakeholder management, Time Management, Communication skills, Fintech domain knowledge acquired.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work environment is very conducive to learning and progress. Everyone here is incredibly helpful, and you can learn a lot from the folks who work here. The task can be done in a flexible manner. The experience I gained here has undoubtedly enhanced my character and personality.

Academic courses relevant to the project: Negotiation skills and management, POM, SQL.

Name: GORANG AGARWAL (2018AAPS0424H)

Student write-up

PS-II project title: Portfolio Management

Short summary of work done during PS-II: I was given multiple portfolios (clients) with whom I worked with. Among them, one of them had a lot of potential and my responsibility to firstly understand the client's business and industry in which they operate. Secondly, figure out a Product Market Fit for that particular industry/client. Then aligning all the relevant stakeholders. Then analysing the data to see how we can grow the business.

Tool used (Development tools - H/w, S/w): Excel, google sheets.

Objectives of the project: Grow my client by 20x in 6 months.

Major learning outcomes: Technical skills – excel.
Soft Skills - Stakeholder Management, Business Analysis.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Since this is a startup, the work hours are not fixed but the work is definitely on the higher side. The learning curve of a person is really good over here.

Academic courses relevant to the project: None in particular. Basics of finance and business would be helpful.

PS-II Station: Rupifi Tech, Bengaluru

Faculty

Name: Febin A Vahab

Student

Name: RITIK ROHIT BAVDEKAR (2017B4A70349P)

Student write-up

PS-II project title: API Integration, Underwriting Policies and Feature Additions

Short summary of work done during PS-II: We learnt how backend engineers operate in a corporate environment. We worked as backend engineers in two different important modules that are indispensable for the working of the product. We learnt how planning is done before even simple tasks are tackled and how to write optimized code in a huge codebase. The aim is always

to write code in a manner to improve the time complexity, decrease memory requirements and keep future modifications in consideration . We also ensure that minimum api calls are used while adding features and minimum access to databases is done. In this internship we learnt how to write good object oriented code in Java. For some tasks we also required designing new tables which required normalization as learnt in Database Systems(BITS course). We put all our theoretical knowledge of courses like Object oriented programming, Database Systems and Data Structures and Algorithms to practical tasks in the organization. It was a transfer of skill from being adept theoretically to applying them in real life problems. We also learnt good practices to ensure our codebase is always pure and free of serious errors. We follow a very versatile procedure of testing and code reviews before our code can go live. This entire procedure gives us ample time to fix any underlying bugs and write safe code. This taught us a lot about safe code practices in a functioning product startup. Overall we learnt a lot of new skills and learnt how to apply our college degree courses knowledge practically. It is a knowledge enriching experience here at Rupifi. We not only learn software related skills but also soft skills like effective communication during code reviews. These soft skills are further enhanced and fine-tuned by our PS instructor, Prof. Febin A Vahab who continuously engages with us and makes us do Group Discussions, presentations and other soft skill based activities.

Tool used (Development tools - H/w, S/w): SpringBoot, Git, Postman, IntelliJ, PostGres, Swagger.

Objectives of the project: 1) Implement new features 2) Resolve bugs 3) Improve existing features in Rupifi Service.

Major learning outcomes: SpringBoot, Git, Postman, IntelliJ, PostGres, API management and creation.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Rupifi is a very open working place where you can interact freely with everyone in the company. The work follows a 14-21 days sprint where new tasks are assigned to you by the Software Manager. These tasks are expected to be completed within the sprint duration. The first week involves discussion of all the tasks which help estimate how long tasks would take. Then interns can start coding different

tasks. After the completion of coding they are expected to test all the changes and then create Pull Requests for code review. After that testing is done by the QA team and task is released in production. The company expects interns to work on important features required for the product. They help with discussions. but expect the intern to do their due-diligence and hard work.

Academic courses relevant to the project: OOP, DBS, DSA and DAA.

Name: SETHURAM S (2018A7PS0101G)

Student write-up

PS-II project title: Backend Development using Spring Boot

Short summary of work done during PS-II: The work was mostly focused on adding new features to the microservices and enhancing the user experience. I mostly worked on implementing a rule engine to reduce the complexity of both the codebase and database. I also worked on an instant credit line activation feature which allowed the users to use the credit as soon as they complete the onboarding journey. Other than these major tasks I also worked on various small bugs.

Tool used (Development tools - H/w, S/w): Spring Boot, Postgres, Git, Postman, IntelliJ

Objectives of the project: 1. Backend development: refactoring and adding new features 2. Implementation of Rule Engine 3. Instant activation of credit line.

Major learning outcomes: 1. Learnt a lot about backend and microservices development.
2. Learnt Spring Boot to build the microservices.
3. Learnt Postgres for managing the database.
4. Learnt about Rule Engine and gained great experience implementing it.

Details of papers / patents: NIL

Brief description of working environment, expectations from the company: It was a great environment to work on. The timings were flexible and work was well organized. Everyone in the team were helpful and supportive, and were open for suggestions. The work was interesting as well and the deadlines were pretty lenient. Overall it was a great experience.

Academic courses relevant to the project: OOP, DBMS, DSA.

PS-II Station: Samsung R & D Institute - Intelligence, Bengaluru

Faculty

Name: Lucy J Gudino

Student

Name: ARIHANT GARG (2017B4A81127H)

Student write-up

PS-II project title: Understanding Multi-intent Utterances using Deep Reasoning NLU

Short summary of work done during PS-II: Worked with several language models (primarily BERT).

Tool used (Development tools - H/w, S/w): Jupyter Notebook (IDE for Python).

Objectives of the project: Finding a way to improve intent detection in compound statements.

Major learning outcomes: Learnt about Machine Learning, Neural Networks, Natural Language Processing (NLP).

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Entire duration was in work-from-home mode. There is a major focus on research activities (paper publications, patents) at the company.

Academic courses relevant to the project: Machine Learning

Name: SIDDHARTH S (2018A7PS0265G)

Student write-up

PS-II project title: Rendering performance prediction with multiple 3d objects in a scene

Short summary of work done during PS-II: Created a model capable of predicting fps.

Tool used (Development tools - H/w, S/w): Android Studio, ML libraries in Python.

Objectives of the project: the primary objective of this project is to create a mathematical model that predicts the number of objects that can be rendered into an AR scene with an acceptable framerate in real-time by taking into consideration various system features (such as RAMs).

Major learning outcomes: 3D modelling, OpenGL, Android app development.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Great working environment. My mentors let me do the work at my own pace. Expectations from the mentors were reasonable and well explained. I have met many employees, all of whom were very kind and helpful.

Academic courses relevant to the project: Domain of the project was ML in Python and Computer Graphics. ML elective courses that I had taken were very helpful in this regard.

Name: IYPE ELDHO (2018AAPS0339H)

Student write-up

PS-II project title: AI-Based Localization in 5G systems and beyond, using beam forming

Short summary of work done during PS-II: I learnt the concept of beam formation and positioning. Then I read various literature related to using radar systems to identify objects and find spatial properties, and learnt how 6G results in the convergence of communication, sensing and localization. Then I familiarized myself with various simulators used to generate the data related to beam formation. Then I learnt about what is beam management and why is it needed. Then I read various literature related to beam management for 3GPP NR at mmWave and analyzed how AI / ML is used for beam management. I also wrote various functions for the 5G simulator in MATLAB and python. I then focused on the time aspect to keep the beam measurements relevant.

Tool used (Development tools - H/w, S/w): MATLAB, Python.

Objectives of the project: Learnt beamforming and positioning, beam management in 5G, creating various MATLAB and Python functions and modules related to this, and reading literature related to such topics.

Major learning outcomes: Gained knowledge of 5G technology. Learnt about beam forming, positioning, and beam management and learnt to code functions for 5G simulators in MATLAB and Python.

Details of papers / patents: None (sent a paper - got rejected).

Brief description of working environment, expectations from the company: The work and the meetings were done through a virtual desktop interface since it was a remote internship. The meetings where the theory and programming discussions happened were conducted regularly. The company experts were very helpful in clearing our doubts.

Academic courses relevant to the project: Wireless communication, machine learning, 5G.

Name: ANURIHA KODALI (2018AAPS1231H)

Student write-up

PS-II project title: Beyond 5g with machine learning

Short summary of work done during PS-II: This project aims to further improve the performance of existing novel framework CsiNet to achieve better experimental results. Using Deep Learning techniques to enhance the development of beyond 5G systems, it can be noted that refurbishing the code for the system may be seen as a method of increasing the experimental values already brought about by established researchers. The final goal of this project is to achieve an informed path to better equip the framework for future advanced networks.

Tool used (Development tools - H/w, S/w): Keras, Python.

Objectives of the project: To improve a framework for csi feedback.

Major learning outcomes: Building ML algorithms, dataset study, running algorithms on production machines.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Good working environment, helpful mentors.

Academic courses relevant to the project: Machine Learning, Signals and systems, information theory and coding etc.

PS-II Station: Samsung R & D Institute - Modem, Bengaluru

Faculty

Name: Lucy J Gudino

Student

Name: ASHISH KUMAR JHA (2020H1240074H)

Student write-up

PS-II project title: Development of simulator platform for Uncrewed aerial vehicle(UAV) assisted non-terrestrial networks based on 5G NR Link Level Simulator (LLS)-QuaDRiga

Short summary of work done during PS-II: I designed the system in MATLAB and obtained the simulation results. I increased the system's channel capacity by using antenna beamforming and concepts of MIMO (multiple input multiple outputs) antennas. The environment was set up according to standard 3GPP specifications. Satisfactory results were obtained, and a conclusion was drawn from my work.

Tool used (Development tools - H/w, S/w): MATLAB.

Objectives of the project: I had to design a system with Multiple Base Stations and Multiple Mobile Stations and use multifrequency simulations to test the system.

Major learning outcomes: Learnt usage of wireless communications and MIMO (Multiple input multiple output) antennas.

Details of papers / patents: The work assigned to me was research. I had to read papers and implement them.

Brief description of working environment, expectations from the company: I had to read the research papers independently and search for relevant material in books, the internet, and thesis papers. The design and implementation part was challenging as everything had to be coded in MATLAB. The learning via this project was excellent and very enriching. It will benefit my career as these types of projects are the dream of every communication engineer. I remain indebted to the BITS PS division for assigning me to do this PS station. I also thank my mentor and manager, who were helpful to me during this internship.

Academic courses relevant to the project: Mobile and personal communication, Advance digital communication, Applied Estimation Theory, RF Microwave.

Name: SAURABH SHUKLA (2020H1240076H)

Student write-up

PS-II project title: Pytorch to Tensorflow Conversion of Temporal Convolution Neural Network for Speech Enhancement

Short summary of work done during PS-II: Testing of various modules of TCN which is based on machine learning. Starting from CNN to check and verify the accuracy and subsequently use TCN which is effective to suppress noise and enhance speech. By varying different parameters and analyse results based on it. Check accuracy to improve result which cancelled noise using adaptive filter algorithm. As in daily application we face echo during voice call so using adaptive algorithm which is non stationary based on different time basis and estimated result which subtract original signal to get estimated value which further being reduced by minimum mean

square error to get effective result. Here testing have done using different module and analyse result.

Tool used (Development tools - H/w, S/w): Anaconda SW.

Objectives of the project: To cancel noise and enhance speech using pyhton libraries.

Major learning outcomes: Learnt to use Python libraries and cancel noise by varying parameters to improve acccuracy.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: As internship in virtually mode so its difficult to resolve doubts or to stuck during project work. If its done on site its easy to clarify doubts and complete task as earlier.

Academic courses relevant to the project: Little bit, mostly based on machine learning.

Name: VINAYA CHANDRIKA U V (2020H1240078H)

Student write-up

PS-II project title: End-to-end automation of keyword spotting task

Short summary of work done during PS-II: A literature study about automatic speech recognition and various kinds of key word detection systems was done. After studying the architecture and other details needed for project, training sessions on each step involved in the task were provided by the team members. The project deals with end-to-end automation of processes involved in training & testing of Connectionist Temporal Classification (CTC) based Keyword Spotter Module. Hence, automation task was done by series of python & shell scripts being triggered by Jenkins based pipeline.

Tool used (Development tools - H/w, S/w): Jenkins, Shell scripting using putty, learnt using a machine learning server.

Objectives of the project: This project is about Keyword Spotting task and its state of the art approaches used in literature. This project deals with end-to-end automation of processes involved in training & testing of Connectionist Temporal Classification (CTC) based Keyword Sp.

Major learning outcomes: Machine learning, Automatic speech Recognition, wake word detection using Shell scripting, Python and Jenkins. Also learnt about key word spotting and verifier architectures.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work flow and division is very structured among team members. Mentors are helpful in clearing the doubts of the Interns and sufficient time was given to do each step in the task. Enough training and resource materials were given before the Interns are asked to do literature survey and start the project work. Also the learning and development team was very helpful in conducting many coding related problem discussion sessions to the employees.

Academic courses relevant to the project: Introduction to Artificial Neural Networks.

Name: NIKHIL KULKARNI (2020H1240081H)

Student write-up

PS-II project title: Reconfigurable intelligent surface (RIS) Simulator

Short summary of work done during PS-II: Studying and Understanding IEEE papers. Studying 3GPP for implementation purposes. Given a task to implement and change a module of the system level simulator that is to be implemented. Optimization of the code implemented.

Tool used (Development tools - H/w, S/w): Matlab.

Objectives of the project: To build a system level simulator for RIS downlink channel which can mirror the real time scenario of RIS.

Major learning outcomes: Understanding of RIS and its impact on future wireless technology (5g and beyond). Understanding how a system level simulator can be built. Different features of MATLAB and code optimization in it.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Should be well versed with MATLAB. Good understanding of digital communications and wireless communication.

Academic courses relevant to the project: Wireless communication, Advanced digital communication.

Name: VITTAL SUCHITH SUBRAMANYAM (2020H1240099H)

Student write-up

PS-II project title: Study and analysis of bixby responses and web scraping

Short summary of work done during PS-II: I have to create a data set of bixby responses on one particular application, then I put this in ML code to get the pos / neg responses of bixby. The second one is to extract info in web page and make it display.

Tool used (Development tools - H/w, S/w): Jupyter.

Objectives of the project: Producing feedback of bixby response and web scraping.

Major learning outcomes: Learnt Machine Learning and web scraping techniques.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working culture and environment is good. Both the mentor and employees are very helpful.

Academic courses relevant to the project: Introduction to ANN.

PS-II Station: Samsung Semiconductor India R&D Center-Hardware, Bengaluru

Faculty

Name: Suparna Chakraborty

Student

Name: PRATYUSH SINHA (2017B1A31006P)

Student write-up

PS-II project title: Auto Defect JIRA ticket creation tool

Short summary of work done during PS-II: To create a tool that takes the results from the regression runs performed by the VM tool. After that, the tool should create issue tickets in name of the people authorized for the failed test case.

Tool used (Development tools - H/w, S/w): Python, Bash, CI-CD tool.

Objectives of the project: To auto-create issue tickets in JIRA for regression results run by VM tool.

Major learning outcomes: Python scripting, Automation.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: You may get to work across different projects and people at the same time. Simultaneous projects can be hard to manage when all the project leaders demand the work to be done within the same amount of time.

Academic courses relevant to the project: The work just involved python scripting. So, good coding skills will come handy.

Name: D'COSTA YULAN LIBRAM (2017B2A30191G)

Student write-up

PS-II project title: RTL Integration for SoC Design

Short summary of work done during PS-II: I was assigned the RTL team in the SoC design group. Initially, was given tasks to compare the RTLs of different projects for the same CPU block, and other text parsing tasks - to familiarize with the RTL of the block I was working on. The team mainly worked on integrating IPs and blocks for the SoC. There were fixed steps to do this - RTL is generated using IPXACT based XML packager, memory generation, MBIST insertion. The RTL generated needed to be checked for sanity, semantic, logical equivalence and so on - this is done through Linting and Sanity checking. Clock issues are solved by CDC checks. Low power design - UPF, VCLP, power cells (retention cells, isolation cells, level shifters). GLS is done finally for the block to check for issues in the netlist generated.

Tool used (Development tools - H/w, S/w): C++, Verilog, Perl.

Objectives of the project: Understand and implement the RTL Integration flow.

Major learning outcomes: RTL Generation, Lint, MBIST Insertion, CDC, GLS.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The mentors and team were very helpful with any of my doubts. Great environment to work in. Only issue was, the PPO results were delayed to the very end (like last month/few weeks). Constantly, be in touch with mentors/managers to display proactiveness and enthusiasm - it helps a lot.

Academic courses relevant to the project: DD, ADVD, Advanced VLSI Design.

Name: NAIK KEDAR SANDEEP (2017B5A30150G)

Student write-up

PS-II project title: Digital Verification

Short summary of work done during PS-II: I helped create modules for verification engine used for testing and verifying new IP's. Wrote regression scripts to automate tedious labor intensive tasks in various departments to be done using Python script.

Tool used (Development tools - H/w, S/w): Cadence, ZeBu, Zrun.

Objectives of the project: To help in the creation of Verification engine.

Major learning outcomes: System Verilog, Python, Softwares related to Emulation and simulation, Verification procedure.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Work environment was good, colleagues were very supportive and always ready to help whatever time it maybe. Company expects you to learn and contribute at a pace you deem suitable and promotes growth.

Academic courses relevant to the project: Micro Processor, Digital Design.

Name: GAUTAM SIBANSH MISHRA (2017B5A81450H)

Student write-up

PS-II project title: Physical design of a CSoC

Short summary of work done during PS-II: I was signed to the physical design team and I was given a small block to do my experiments which I carry forwarded in the given the time and was input to deliver on time beside this I also work done scripting.

Tool used (Development tools - H/w, S/w): Synopsis tools.

Objectives of the project: Designing a block of a CSoC.

Major learning outcomes: STA, Physical Design, Synthesis in VLSI.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The culture and working environment is good.

Academic courses relevant to the project: ADVD

Name: JASDEEP SINGH (2018A3PS0526G)

Student write-up

PS-II project title: Work in Digital Television System on Chip Team

Short summary of work done during PS-II: There were different sub projects which I worked on, one was using the equation of RGB to YcbCr, $R'G'B'$ act as the input port and Y, Cb, Cr act as the output port, while coefficients being inputs stored in registers and necessary logical operation performed in RTL Design to get the necessary output. After creating the MicroArchitecture for RGB2YCbCr converter and writing the RTL code, a verilog testbench was written, so as to verify and the simulation was run on Cadence. Second was histogram filter, my task involved writing and verifying the RTL code for Histogram Filtering, by extracting Histogram data of a particular frame of a DTV video from Memory, synchronizing Clock signal with VSYNC, Data Enable and HSYNC Pulses and using logic to transform the old image into a modified Histogram Filtered Image. The process involved creating MicroArchitecture of the above process, writing Verilog code and Testbench. Third task was to work on Histogram Filter, my task involved creating a MicroArchitecture for Histogram Calculator of a particular frame of an image, then writing the RTL Code for processing the input data and Testbench for verification. The process involved taking the input data, synchronizing Clock signal with VSYNC, Data Enable and HSYNC Pulses and using logic (combinational and sequential and memories) to calculate the histogram for a frame of the DTV data and storing it in SRAM Memory but initially, the work involved had a delay of 132 clock cycles for Histogram calculator. After optimization of the circuit by adding more SRAM Memories and more shift registers for pipelining, so as to reduce the delay to 36 clock cycles. The work involved changing significant amount of Microarchitecture due to issues in timing analysis, which was corrected for the new and optimized Histogram Calculator. The 4th was to design CRC16 checker and the design problem involved input to be 16 bits/clock cycle and a total pack of data to 2^{14} bits, which means after 1024 clock cycles data enable has to be disabled. For this I designed a pipelined architecture. The RTL Code of the above was written and a verification testbench designed for the same. This application is being used for Samsung's special client in their product. The disadvantage of pipelined architecture came with the trade-off of extensive use of Hardware compared to parallel CRC checker. My overall experience in Samsung Semiconductor was great as I learnt and experienced various ways of designing architecture for Samsung and its clients.

Tool used (Development tools - H/w, S/w): Cadence, GVIM, LVT Analysis, TCL.

Objectives of the project: There were two projects which our team was working on, one was on 8K DTV and the other was for a special client, so the objective was to work on 12 nm technology initially and design a whole microarchitecture for DTV SoC but later on, we had to change it.

Major learning outcomes: Major learning outcomes involved microarchitecture design, RTL Coding, Clock Gating techniques, Algorithms for optimization of circuit, Synthesis of RTL code written for a particular design. Learnt how video processing in a TV works, different AMBA protocols and CRC checker design. I also learnt how to be a part of the team and gaining insights from the work that our team is doing.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The team which I worked on was DTV SoC, the members which I worked with are very hard working. Since the team was a very important one, we continuously had projects incoming. So, the work environment was a bit hectic and learning had to be done oneself as other members were busy in the tasks assigned to them. My overall experience in Samsung Semiconductor was great as I learnt and experienced various ways of designing architecture for Samsung and its clients but the work involved was intense.

Academic courses relevant to the project: Digital Design and Computer Architecture.

Name: VAIBHAV KUMAR JAIN R (2020H1230236P)

Student write-up

PS-II project title: 1) Automation of register for software and driver bringup of memory hardware and 2) Plotting of eye diagram from lpddr

Short summary of work done during PS-II: Project1: Developed a GUI using Python which can be used for automation and is very user friendly and consists of many features, Project2: Currently working to develop a Python script to plot eye diagram for Ipddr.

Tool used (Development tools - H/w, S/w): Verdi, Visual studio code.

Objectives of the project: Objective of first project was to build a GUI which has user friendly features to interact with the register file and make work simpler. Objective of second project is to plot an eye diagram for an Ipddr as from the eye diagram we can find many things related to it.

Major learning outcomes: Python Programming, Linux.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Working environment was good. Even though whole internship was wfh team was supportive and gave enough time to learn. Expectations from the company was reasonable.

Academic courses relevant to the project: Digital VLSI design.

Name: BHAVANI SANKAR PANDA (2020H1230247P)

Student write-up

PS-II project title: Enhancement of Reusable Verification Components & Automation using Perl

Short summary of work done during PS-II: Camera Image sensors are evolving at a rapid pace to meet the market and customer demands. The complexity of image processing IPs are increasing to enhance the image quality. For verifying these complex IPs, one needs to have reusable verification components. With addition of new features, these reusable verification components need to be enhanced to support new features. Also, within the same product cycle

time, the number of sensors to be verified are increasing. To handle this, one needs to use the power of automation to handle the reusable components. As a part of project work, the verification components with the new features and automated assertions using Perl scripts have been accomplished.

Tool used (Development tools - H/w, S/w): Cadence Xcelium, SimVision, IMC tools.

Objectives of the project: Enhancing the verification components in the existing testbench with more number of features. Extraction of data from Excel sheets and creating checker files by them using Perl.

Major learning outcomes: Languages & Methodologies: System Verilog, UVM, Perl.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The internship is completely from home. There was a online team wise game in which I had won 1200 rupees of Swiggy voucher. There are weekly meetings and the mentor and buddies are available most of the time. I had expected at least two months to work from office but it didn't happen.

Academic courses relevant to the project: Testability of VLSI, VLSI design, CAD for IC design.

Name: SOURABH SINHA (2020H1230347H)

Student write-up

PS-II project title: Performance / Latency measurement and Debug tool

Short summary of work done during PS-II: 1. Preparation of Graphical User Interface for the existing Performance/Latency measurement tool . 2. To work on the python script for the coding of Debug part and embed this into the existing tool. 3. Various discussions for the modification of tool and the reports to be generated and analysed.

Tool used (Development tools - H/w, S/w): Gvim - Editor for python script, Linux- operating system.

Objectives of the project: 1. Preparation of GUI. 2. Scripting of debug part.

Major learning outcomes: Learnt about Python language, linux, gvim editor, GUI preparation, scripting in python and pandas module.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: As for the working environment, I found that the mentor and team members are helpful in clearing your doubts and helping you with the work in difficulties. And for the work it is possible to reach out to any other official person for any information needed. For my work I had to give demo and coordinate with other teams as well since the work was kind of collaborative in nature. The usual expectations from the company is for providing the time to learning in case of new work, the helping hands in some cases and the supportive colleagues which the company delivers.

Academic courses relevant to the project: VLSI design, the basics of digital circuit and some coding experience were relevant in understanding the work and its scope.

Name: CHEKURI DEEPAK (2020H1400222H)

Student write-up

PS-II project title: Automation in System on Chip (SoC) Integration

Short summary of work done during PS-II: The SoC integration is one of the time consuming process. In this project, this issue is addressed and a python script is generated to automate port declaration and port mapping the SoC integration.

Tool used (Development tools - H/w, S/w): Anaconda is used for generating the python script. Synopsys is used for lint setup and testing.

Objectives of the project: To reduce the time taken for SoC integration. To automate the manual integration using automation.

Major learning outcomes: Regex library module in python. Types of SSDs and interconnects used in SSDs. CXL interconnect.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Due to the covid pandemic, most of our PS is work from home. But from my teammates and mentor are quite helpful and are always ready to help. I wouldn't expect much more than to continue with this wonderful organization. The learning outcomes and the technologies working on is top-notch.

Academic courses relevant to the project: Advance VLSI Architecture, VLSI architecture.

PS-II Station: Samsung Semiconductor India Research - Software, Bengaluru

Faculty

Name: Anita Ramachandran

Student

Name: PRAGYA RAJESH SINHA (2017B1A31749H)

Student write-up

PS-II project title: CMOS Image Sensor Firmware

Short summary of work done during PS-II: Worked on creating tool that outputs the config files header data, designed config file for image sensor based on requests, debugging of firmware related issues.

Tool used (Development tools - H/w, S/w): SW - C/C++, Python; HW - FPGA board.

Objectives of the project: To work on development and improvement of CIS FW.

Major learning outcomes: Learnt about firmware.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Helpful and friendly team, mentor was immensely helpful in guiding and teaching few basics and was available to answer any doubts.

Academic courses relevant to the project: Microprocessor and Microcontrollers.

Name: SAI CHARAN THODUPUNURI (2017B1A31756H)

Student write-up**PS-II project title: Device driver development**

Short summary of work done during PS-II: Development of the software / drivers for the hardware designed by the company. Firstly would involve non coding tasks but still can be developing. By understanding our capabilities they would start giving tougher and complex tasks. Here in samsung you may not get projects, but for sure you will pseudo projects / tasks.

Tool used (Development tools - H/w, S/w): Gerrit, mobaxterm, vcast, sam tool, designed boards

Objectives of the project: Driver development

Major learning outcomes: Driver coding

Details of papers / patents: Confidential

Brief description of working environment, expectations from the company:

Academic courses relevant to the project: Operating systems.

Name: RAJ AARYAN (2017B4A80753P)

Student write-up

PS-II project title: Handling of Input Output Management Layer

Short summary of work done during PS-II: My work revolved around controlling read and write feature by controlling the sublayer of Flash Translation layer. During my initial days I was trained on pre existing Firmware and introduced to the bottlenecks in Firmware. Later part of Internship was focused on contributing to next generation of Firmware and write optimal code for the same.

Tool used (Development tools - H/w, S/w): Samsung proprietary tools, VS Code, MS Visio.

Objectives of the project: Contribution to the Firmware commercial product.

Major learning outcomes: In depth knowledge of Firmware, contribution to next generation Firmware.

Details of papers / patents: NIL

Brief description of working environment, expectations from the company: Work life balance is decent. As the project are Industry centric and technology used are proprietary to

organization, company doesn't expect anyone new in that domain to have those specific knowledge but as someone is supposed to understand and contribute on large codebases, you are expected to have decent idea and practice for the OOP, DSA, CP and possibly OS.

Academic courses relevant to the project: OOP, OS, DSA, CP.

Name: SARTHAK CHOWDHURY (2017B5AA0909H)

Student write-up

PS-II project title: Accuracy calculation for different ML models and Study on AI Benchmarking using different Neural networks

Short summary of work done during PS-II: Understood the accuracy code given for the models in kotlin language and wrote the accuracy code for the models in Java by using the same logic and algorithm. Read the article on AI benchmarking using different Neural networks and studied various research papers on how different neural networks are used and by using a modified dataset and method, AI benchmarking can be done in an improved and optimal way.

Tool used (Development tools - H/w, S/w): Android Studio, Sublime text.

Objectives of the project: To write the accuracy code for different ML models and study and report about AI benchmarking using different Neural networks.

Major learning outcomes: Coding in Java the accuracy code for given models, Understanding the code in kotlin for the given models, Learning about the usage of different neural networks in AI benchmarking.

Details of papers / patents: Articles on ai-benchmarking as a whole and various research papers for different ai benchmarkings.

Brief description of working environment, expectations from the company: Since the mode was online so access to rbs and internal servers based on permissions. Very helpful people, keen to solve your doubts and help you out when possible. Permissions do take some time to come but the people there understand and sufficient time is given for the work, good work life balance.

Academic courses relevant to the project: OOP, ML.

Name: RISHI SUDHIR PHAYE (2020H1400230H)

Student write-up

PS-II project title: Implementation of Counter DUT and APB protocol using UVM

Short summary of work done during PS-II: Developed test bench for APB protocol & the assigned DUT using UVM architecture. Learnt about NVMe Specification and did automation on that using C/C++ language. Learnt Linux working and functionalities.

Tool used (Development tools - H/w, S/w): EDA Playground, Xilinx Vivado, gvim, Eclipse.

Objectives of the project: To learn System Verilog, UVM & coding test benches based on Universal verification methodology for ASIC designs.

Major learning outcomes: NVMe Specifications, Memory Protocols, System Verilog, UVM, C and C++ Language.

Details of papers / patents: None

Brief description of working environment, expectations from the company: There is good working environment and technical culture. There are always some sessions and activities going on which help us to learn new things and explore. There are also some special HR sessions for support. All the employees are friendly and are willing to help in case we have any doubts or queries.

Academic courses relevant to the project: Yes

PS-II Station: Sandvine, Bengaluru

Faculty

Name: Seetha Parameswaran

Student

Name: KAUSHAL RAJAN HATWAR (2020H1030122P)

Student write-up

PS-II project title: Control plane – maestro policy engine

Short summary of work done during PS-II: Twenty-three JIRA tickets were successfully completed during the span of the internship. Programming languages like C++, YAML, YANG and Go were used along with bash scripting to carry out the coding tasks. Two new services were created for existing product. These activities were challenging as they required extensive knowledge about the functionality of existing product and various network documents like the 3GPP 5G specs documentation, internal Wiki pages and release notes that specified standards for designing of core network function. Various brainstorming sessions were conducted with senior developers to ensure proper development of new feature. Proper unit testing was done to ensure that existing functionality is not broken while implementing the new ones. To alert the customer of any unusual activity, 2 SNMP Alarms were designed. These alarms would signal the client about specific abnormal scenarios and allow the client to take the necessary actions to overcome the irregular circumstances. Both alarms are successfully deployed. Proper internal documentations were created and client's user manuals were updated accordingly. Logging has been a very important tool for identifying bugs and debugging the found bugs. Log filtering logic

was implemented for the newly created services i.e. registration service for 5g Core and implementation of interaction service in MPE with 5g Core. Upon successful implementation, log messages were accurately filtered, segregated and collected. During the LTS release, several UTs had to be created using Sandvine's in-house scripting language to test the functionality of the new product.

Tool used (Development tools - H/w, S/w): Vscode, Git, JIRA, YAML, YANG, TCL, Putty, Linux servers.

Objectives of the project: Real time Policy Enforcement, Online Charging, Subscriber Awareness.

Major learning outcomes: Implementation of new features like the creation of registration service for 5g Core, handling race conditions through go routine and creating sample policies for clients have provided tremendous opportunities for aggressive growth. Apart from gaining technical skills to develop code as per the industry standards, there has been significant improvement in soft skills by participating in daily stand-up meets, sync meets and monthly team meet.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: A high workload environment. Team is very helpful and no politics among the team. Great scope for aggressive learning.

Academic courses relevant to the project: Advanced Computer Network.

Name: DIVEKAR SAURABH VIKAS (2020H1120275P)

Student write-up

PS-II project title: Design of Signatures

Short summary of work done during PS-II: Day to day work includes designing of signatures which can classify traffic flowing through the networks which includes use of c/cpp or internal languages.

Tool used (Development tools - H/w, S/w): C, cpp, jira, git.

Objectives of the project: Classify more than 90% of traffic going through customer networks till application level and design revenue model.

Major learning outcomes: Networking, Network intelligence.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: As an intern expectation is to grasp the knowledge and complete jira tickets assigned.

Academic courses relevant to the project: Partially yes not completely.



PS-II Station: SAP Labs, Bengaluru

Faculty

Name: Seetha Parameswaran

Student

Name: MAYANK MITTAL (2018A7PS0375G)

Student write-up

PS-II project title: Gardener, machine controller manager

Short summary of work done during PS-II: Contributed to Machine controller managers all of its providers and cluster autoscaler all open source repository can be checked on GitHub under gardener organization, gardener project.

Tool used (Development tools - H/w, S/w): Golang, docker, kubernetes, gardener, gomega, ginkgo.

Objectives of the project: Contribute towards the Open source project of SAP cloud team – gardener.

Major learning outcomes: Kubernetes, golang and custom controllers as well software at scale. Working with all the hyperscalers.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very good working environment, comfortable team mates, good work life balance, proper time for learning and implementation.

Academic courses relevant to the project: NA



PS-II Station: Schlumberger, Pune

Faculty

Name: Samir Kale

Student

Name: GHARGE AKSHAY KAMALAKAR (2020H1420191P)

Student write-up

PS-II project title: Model based approach for design and sustainable automation

Short summary of work done during PS-II: Classification and selection of the asset for automatic assembly. study an understanding of each parts. Creation of coordinate system for each subpart in assembly and standardization of the origin of coordinate system. creation of family tables and UDF for all the standard parts. Analysis of different possible permutations and combinations of possible assemblies.

Tool used (Development tools - H/w, S/w): Creo, Excel, GEMS.

Objectives of the project: Assembly automation along with it's 2D drawings.

Major learning outcomes: Understanding different automation features such as family tables, UDF, coordinate system. Understanding of given asset assembly with it's functions, integration of different tools for automation.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is very helpful and empowering. You with given the freedom to express your idea regarding the projects. Weekly review of your work will be done and proper guidance will be given if required. along with the project you will be a part of the different team building activities and essential basic training.

Academic courses relevant to the project: Design project.

PS-II Station: Scienaptic Systems Pvt. Ltd., Bengaluru

Faculty

Name: Jyotsana Grover

Student

Name: PUSHKAL GOYAL (2020H1120271P)

Student write-up

PS-II project title: Visualizing the performance of Credit Unions

Short summary of work done during PS-II: The work that I have done was related to the forecasting the performances of credit union and make them presentable to upper management and the clients. The heart of the project was to make the forecasting plots visually appealing and presentable to clients which I was able to do. We took the data from the NCUA web which contains all the parameters that could related to performance and based on that we have presented our data. The time series that we have used in the Holt Winters algorithm popular because of the capability to detect seasonality. There were several other time series models that we have done but the most appealing results was from the Holt winters algorithm. I have put significant efforts in plotting the forecasts and make them visually appealing. This has worked to some much extend and mentor was satisfied with the work that was done so far.

Tool used (Development tools - H/w, S/w): Jupyter, Python, Time Series models.

Objectives of the project: The purpose of the project was to make the performance of the credit unions presentable to the client and the upper management. The project was all about the performance of the credit unions and evaluating them based on certain metrics.

Major learning outcomes: Learnt the way to make the plots more intuitive.

Learnt the time series models and various challenge related to time series data.
Learnt the various attributes of finance, like Net worth ratio, Equity to Assets ratio.
Learnt to present ideas well to the team.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The people here are very polite and co-operative. There were times when I was stuck in the work and there was no way out. At that time, they helped me out of the way. Scienaptic AI follows the flexible work timings, no constraints on timing as far as you can deliver the expectations. The organization however is serious for the the good performance. The expectations was same that a fresher can be able to fulfill. My mentor only expected me to write clean code with some proper explanation to the patterns found in the dataset. During initial stages it was a little bit challenging but afterwards things started to take in good position. Overall the experience was very positive with loads of learning.

Academic courses relevant to the project: Data Mining, Graph Mining, Machine Learning.

Name: VIJAY MALIK (2020H1120304P)

Student write-up

PS-II project title: Underwriting Platform Enhancements

Short summary of work done during PS-II: Adding performance majoring feature and how to google Api's.

Tool used (Development tools - H/w, S/w): IntelliJ, Prometheus, Play framework, Scala.

Objectives of the project: To add functionality in the project that helps teams to see the performance of the product.

Major learning outcomes: Learnt about performance majoring tools and development.

Details of papers / patents: No

Brief description of working environment, expectations from the company: Gave enough time to explore the things and mentors are supportive.

Academic courses relevant to the project: Yes

PS-II Station: Sentio, New Delhi

Faculty

Name: Sandeep Kayastha

Student

Name: KONGARA RITHEESH DEVARAJ (2017AAPS0387H)

Student write-up

PS-II project title: Translation pipeline

Short summary of work done during PS-II: Create a python package to facilitate html doc translation and synonyms generator from csv file and have the package ready for deployment through docker. Testing using any py packagezs to facilitate the task could be then later mentors would suggest if any better ways were there to perform the same task to optimise Instead of going to direct coding part we went from starting with tools and learning to use them like git, docker, poetry, acces to git repository. The initial task was to just translate a given word to desired language. Then comes html p roccessing which we went from initially inspecting an html konwing

its components, then searching for ways to identify the path of the contents in html which we finally used xpath a feature in html. Initially my idea was to retrieve all xpaths in html, identify which xpath have .text in them, then retrieve text to translate and replace the translated in the respective xpaths.

Tool used (Development tools - H/w, S/w): GIT, Docker, Poetry, LXML, BS4 [beautiful soap], Pytest, Python.

Objectives of the project: Python package to facilitate HTML doc translation.

Major learning outcomes: Structure of packages, package deployment, learnt a python programming language, usage of git, lxml, familiar with beautiful soup, gained an understanding of docker.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Very welcoming, understanding, friendly.

Academic courses relevant to the project: DSA.

Name: SOHIL KHAN (2017B3A30591P)

Student write-up

PS-II project title: Implementation

Short summary of work done during PS-II: Script was written in an environment with limited access to writing/change data while not being too complex to be used by non-technical staff. The learning outcome of this assignment was to get used to REST APIs using the request package of Python, the Importance of Tagging for an organization, and how it's a beneficial feature of the Sentio Notebook terminal. Wrote Script to get aggregated data from the summary report, which

customers could use for confirmation and personal purposes. The learning outcome of this assignment was to get familiar with the Pandas module and Python syntax for handling spreadsheets in a Python environment. Also, I had a better understanding of tagging feature of Sentio when managing the spreadsheets and how researchers use them in their daily workflow. Developed an access-control system using REST APIs. The learning outcome was getting used to the Django framework, MongoDB queries, format and parameters required in the HTTP response and understanding the working model used for creating access control. Using the backend modules provided by Sentio, a script was written, which takes the required notification settings as data and updates the settings while maintaining logs of errors in between and also save previous notification settings. The learning outcome of this assignment is to know how the features we look at UI work in the backend and knowledge of working with tools like IPython Widgets and Pandas. Developed a custom template for Sentio's Excel Plugin. The learning outcome of this assignment was to get a better understanding of Sentio's Excel Plugin. While developing the template, I also gained better experience working with excel on financial metrics of Sentio like Ticker to relative index performance. Helped in the migration of Evernote data into Sentio. The learning outcome of this assignment was to understand the technical stuff behind the migration of different data sources, which in this case was the Evernote notebook. I got a better understanding of parsing XML documents into HTML, the importance of adding an inline image and other resources to make it more efficient. Helped write queries to get analytical data out of the PostgreSQL database. The learning outcome was to get used to PostgreSQL syntax. Explored the rule engine backend. The learning outcome was how I could create the rule to automate the workflow of users.

Tool used (Development tools - H/w, S/w): Django, Jupyter Notebooks, PostgreSQL, MongoDB, Pandas, Excel, Redash.

Objectives of the project: Automating tasks.

Major learning outcomes: Workflow of an research management system and other tools like Django, PostgreSQL, MongoDB, Pandas, Requests, HTTP, financial metrics.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Excellent working environment, had a lot to learn during these 5 months. Teammates were very kind and were always there with any of my doubts. I also felt included in all their meetings even though I had no experience before.

Academic courses relevant to the project: CS F213, CS F372.

PS-II Station: Siemens Technology, Bengaluru

Faculty

Name: Seetha Parameswaran

Student

Name: CARDOZ BASIL PETER (2020H1060263H)

Student write-up

PS-II project title: Conversion of Orthographic drawing to 3D CAD model

Short summary of work done during PS-II: The project involves extraction of features from engineering with the help of Computer Vision and Optical Character Recognition (OCR). Machine learning algorithm are used to improve the overall detection. CAD scripting is also used to convert the drawing contours into a final CAD Model.

Tool used (Development tools - H/w, S/w): Python, FreeCAD.

Objectives of the project: Analysis and convert engineering drawing to CAD models.

Major learning outcomes: CAD scripting, Computer Vision, Optical Character Recognition.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is very supportive and provides ample learning opportunities to improve understanding and knowledge in a variety of domains. The projects challenge you to think outside the box and come up with solutions to address any problem.

Academic courses relevant to the project: Computer Aided Design, Computer Vision.

PS-II Station: Sigmoid, Bengaluru

Faculty

Name: Anindya Neogi

Student

Name: TATHAGATA ROY (2020H1030037G)

Student write-up

PS-II project title: Covid data analysis from Twitter

Short summary of work done during PS-II: IN my PS-II I have a great learning experience across different technologies. In the beginning of PS-II I have undergone a lot of training, assignments and assessments. After that I have been assigned to the project. This project gives a practical experience of formulating and gathering data, summarizing of the data, and finally making a conclusive outcome from the data. An end-to-end data engineering ecosystem for

getting data from Twitter API and other sources, filtering, and transforming it to get the required data is being implemented in this project. This project involves ingestion of a large amount of data from Twitter API and other sources and dumping them to Kafka Topic. The mentor of my team was very experienced and really helpful to us. I also had really good team members. Sigmoid is a data company that works on cutting edge technologies so it provided me with a great learning opportunity on those technologies. Apart from learning I also have learnt core values that Sigmoid follows that are Customer Focus, Team Player, Ownership & Accountability and continuous learning.

Tool used (Development tools - H/w, S/w): Python, Kafka, MongoDB, Matplotlib.

Objectives of the project: Analyze tweets regarding Covid19 accross different countries from different set of users.

Major learning outcomes: This project gives a practical experience of formulating and gathering data, summarizing of the data, and finally making a conclusive outcome from the data.

Details of papers / patents:
<https://drive.google.com/file/d/1w6E7mlo2aQbm4UHcE7Tc9x9x8nmdMiAN/view?usp=sharing>

Brief description of working environment, expectations from the company: Though the internship was from work from home we had daily meets with our managers and mentors. They provide us help if we had encountered some problems in our projects. The company provided us great learning opportunities that will help me on my carrier.

Academic courses relevant to the project: NA

PS-II Station: Silicon Laboratories, Inc., Hyderabad

Faculty

Name: Kranthi Kumar Palavalasa

Student

Name: PRANJAL PRASAD (2020H1030035G)

Student write-up

PS-II project title: Real Time Statistics from Firmware

Short summary of work done during PS-II: Learnt about 802.11 wireless standard and 802.11ax WiFi 6 and its new features. Worked on getting Real-Time Statistics from firmware for sent / received packets. Ran test cases on Rs911 board for WFA certification. Mapped Assemble Language instructions to RISC-V for the proprietary PPE processor of Silicon Labs.

Tool used (Development tools - H/w, S/w): RS911x boards, Github, VS code, Zoom, Teams, Word.

Objectives of the project: In order to debug and analyse our code for RS911x boards, Silicon Labs developed a proprietary software to obtain real-time information of sent/received packets directly from the firmware.

Major learning outcomes: Learnt how to get real time statistics from the firmware.

Learnt about 802.11 wireless standard and 802.11ax (WiFi 6).

Understood Assembly Language Programming, differences between RISC and CISC Instruction Set Architectures.

Details of papers / patents: The purpose of the paper is to provide readers a better understanding of Wi-Fi 6 and its new features. Wi-Fi 6 is intended to address the issues that have slowed the adoption of the technology in the IoT. Wi-Fi 6 was designed to meet the requirements.

Brief description of working environment, expectations from the company: The integrated hardware and software platforms, intuitive development tools, unequalled ecosystem, and

trustworthy support from the team make Silicon Labs a great place to work. Throughout the product lifecycle, developers can easily handle challenging wireless tasks and swiftly bring revolutionary solutions to market that revolutionize businesses, increase economies, and improve people's lives.

Academic courses relevant to the project: Cloud Computing, Computer Architecture and C Programming were very helpful and relevant to the project.

Name: PRATEEK SAXENA (2020H1030110H)

Student write-up

PS-II project title: Adding bootloader test cases for PantherZ board and another project is creating workspaces for multiple projects in simplicity studio

Short summary of work done during PS-II: Get the exposure of how projects are build in silicon labs, their tools and tech stack behind their simplicity studio tool. Got the chance to work on implementing new features in simplicity studio(which is called as IOTREQ) as fresher's are not involved in company internal projects which will be releasing in next quarter so I am fortunate enough to get this kind of work in silicon labs. Adding bootloader test cases like unit test, interface tests and system tests is also real project for newly developed project. Got to know about embedded c programming and also get to know how to work on various silabs boards and also some initial ramp up projects were assigned like blinking led in silicon labs boards etc. Various training sessions were given to understand the tools and programming techniques used in company.

Tool used (Development tools - H/w, S/w): Tools used - Simplicity Studio, Ozone debugger, Putty, tera term, commander, docker, rancher, git, linux system.

Objectives of the project: Get to know how to add bootloader test cases for newly board and get to know about the flow of universal configurator and how to create multiple projects by creating workspaces which contains multiple projects.

Major learning outcomes: Get to know how about UC flow of various projects and how projects are build in simplicity studio and whats the flow behind making new application or bootloader and get to know about various tools like simpicity studio which is used by all paltform teams in silicon labs and also have hands on ozone debugger tool. Learned how projects are made in industry level.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment in company is very good and team members are quite friendly and helpful and you can ask any questions from anyone in your team or any other team, everyone will try best to resolve your issue and even manager is very friendly and he will take suggestions from you and will try to improve internship experience and also helps you and even directors are very chill and you can suggest any idea in team meeting, everyone will treat you like an full time employee not as an intern.

Academic courses relevant to the project: Advance operating system.

Name: RAJEEV KUMAR (2020H1030152H)

Student write-up

PS-II project title: Real time Stats of the frames at LMAC layer

Short summary of work done during PS-II: Implemented how driver sends the real time stats enable frame containing required field and send it to the firmware and then firmware sends the real time stats response frame and driver sends this information to the application and it printed the status. We get various status like Transaction status type, length, queue (In which queue the tx_pkt is queued), RETRY COUNT (how much times packet retried), how much power will packet transmit , timestamp taken at the time of sending transaction packet or ack, then we have tried to test various certifications for WFA and worked PPE (packet processing Engine).

Tool used (Development tools - H/w, S/w): Linux, Wireshark and C language.

Objectives of the project: To find the status of the frames at LMAC layer.

Major learning outcomes: Packet processing at LMAC layer, Mapping of one Instruction set to other, Optimizing the packet Tx (transmitting) and RX (receiving).

Details of papers / patents: None

Brief description of working environment, expectations from the company: Very good work culture, great learning opportunity, supportive team mates, given ample amount of time to learn new things, no pressure from their end, in short its always good to work here.

Academic courses relevant to the project: Yes few of them were directly / indirectly relevant to our project specially networking and OS concepts.

Name: KARANAM L S DHEERAJ KUMAR (2020H1400102G)

Student write-up

PS-II project title: Simulation Environment Framework

Short summary of work done during PS-II: Designed and developed a simulation environment framework that acts as a testing tool for various bluetooth modules.

Tool used (Development tools - H/w, S/w): Software - Python, C.

Objectives of the project: To design a simulation environment for rapid testing of bluetooth modules.

Major learning outcomes: Understanding of various bluetooth modules and their interactions with each other.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Great work space with balanced work-life. Enjoyed my time working here. Looking forward to work on more cutting edge tech, looking forward for challenging roles and responsibilities.

Academic courses relevant to the project: Software for embedded systems, Embedded system design.

Name: SWAPNIL SRIVASTAVA (2020H1400126G)

Student write-up

PS-II project title: Post Silicon Validation and Automation

Short summary of work done during PS-II: Calibration of Wi-Fi modules and Python based automation.

Tool used (Development tools - H/w, S/w): Python, Matlab, Linux, Git Stash, Jenkins, Spectrum Analyzer, Signal Generator, ICs.

Objectives of the project: To understand the Post Silicon validation flow and Migrate the automation from MATLAB based to Python based environment.

Major learning outcomes: Learnt how to create the complete workspace on Bitbucket (Git) and continuous integration of codes in it using Python Programming, also Hardware knowledge regarding ICs.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: working environment is quite good, company is employee friendly, also work life balance is maintained here.

Academic courses relevant to the project: DSP, ANN.

Name: DEEPAK BHARADWAJ (2020H1400229H)

Student write-up

PS-II project title: Firmware Code Warning Removals and GCC compilation Analysis

Short summary of work done during PS-II: Initially in the start of the internship I was assigned in the unit testing frame work task and where I learnt about Cpp unit testing (C plus plus Unit testing) framework and I solved some testing cases on the Queue type of data structures. Predominantly my internship was concentrated on GCC compilation steps and removal of firmware code warnings. Where I learnt the importance of warnings from the header files and the impact it creates on the source files. I resolved various types of source file warnings such as Unused variables, implicit declaration of functions, incompatible pointer type, cast from pointer to integer of different size, assignment makes pointer from integer without a cast and many more.

Tool used (Development tools - H/w, S/w): Visual Studio code, wise connect, Terra term.

Objectives of the project: To study and analyze the GCC compilation process and fix the firmware code warnings from all the header files and source files.

Major learning outcomes: GCC compilations steps and process, removal of header files warning and removal and fixing of various types of source file warnings such as Unused variables, implicit declaration of functions, incompatible pointer type, cast from pointer to integer of different size, assignment makes pointer from integer without a cast and many more.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The Working environment here in Si Labs is ideal and it has perfect work life balance culture. Si Labs treat their employees with much care as their own family.

Academic courses relevant to the project: Embedded System Design, Software for Embedded Systems, Computer Architecture.

Name: SAYAN BAIDYA (2020H1400235H)

Student write-up

PS-II project title: Post Silicon Validation of SAR-ADC module

Short summary of work done during PS-II: After tape out of silicon IC's, the functionality of the modules must be validated and compared with the simulation results before releasing it in public. There are many modules in a DUT and my responsibility was to validate the performance of the ADC module in the DUT. For the project, the dynamic parameters like FFT analysis for noise floor and signal frequency, SNR, SINAD, THD and ENOB and static tests like INL, DNL, Gain and offset Error were characterized. For high resolution ADC, the performance of the instrument used in labs and an instrument from a vendor were compared by seeing the distortion power in both and team finalized to buy the instrument after a much lower distortion was observed in the new instrument. Now, will be involved in developing and debugging other tests in ADC and understand the validation process of other modules.

Tool used (Development tools - H/w, S/w): Software: Python; IAR; Power Bi and Excel; Ni max; Hardware - DUT board, Power supplies, Source meter units, Arbitrary waveform generators, DMM, Frequency counters, Ni PXIe-4466, Silicon IC prototype.

Objectives of the project: To validate the functionality of the SAR ADC module on Silicon Prototype by characterizing its static and dynamic parameters and check its performance.

Major learning outcomes: - To bring up the DUT in a automation setup and understand the connections on board as well as the IC. Go the register level knowledge for making the device work in desired mode.

- Understand the instrumentation part and set up workspace by connecting required hardware for validation of the DUT.

- Develop the static and dynamic test for ADC and use it to compare the performance of Ni and Keysight equipment.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The finest thing about this PS station was the working environment. Fortunately, the team assigned to me, as well as my manager and mentors, were some of the nicest people I've ever met. Always willing to assist and then react. Nothing is required of you, and they will provide you with far more than you expect. Enough time will be given to become familiar with the projects you'll be working on. The first two months are more about getting accustomed to things by going through the datasheets of the DUT and then the a project is given to get accustomed to the job we will be doing. As long as you're willing to put in some effort, you'll be OK. The guidance provided and the help from other team members is enough to get used to the work.

Academic courses relevant to the project: Analog Circuit design, Embedded system design, Python and C courses, Instrumentation courses.

PS-II Station: Singularity Ventures, Mumbai

Faculty

Name: Benu Madhab Gedam

Student

Name: SAAHIL DHAKA (2017B4A20666P)

Student write-up

PS-II project title: Real Estate Valuations in Major Indian Metros

Short summary of work done during PS-II: I wrote various scripts to clean and analyze data related to real estate prices and trends across indian cities. The analysis involved seasonality, trend and time-series analysis of the data along with building effective reports.

Tool used (Development tools - H/w, S/w): Affinity, Excel, MySql, Minitab, PowerPoint.

Objectives of the project: The objective was to breakdown the real estate trends in major indian cities by analysing proprietary data form the firm. Then use this analysis to create report on valutation trends at both the macro and the micro level.

Major learning outcomes: Learnt various valuation techniques as well the various trends and working of the real estate markets. In terms of technical skills Learnt different softwares related to data analysis, data-cleaning, modelling etc

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work environment is inspiring and full of driven smart individuals. Involves long hours and a lot of hard work. It's a fast paced environment hence requiring a lot of self-learning and rapidly adapting to requirements. The team is extremely professional and motivated and sometimes may feel demanding but the opportunity to grow is tremendous.

Academic courses relevant to the project: Construction Planning and Technology, Civil Engineering Materials, Applied Statistical Methods.

PS-II Station: SMEC India Pvt. Ltd., Gurugram

Faculty

Name: Nithin Tom Mathew

Student

Name: KANDEPU BHARATH CHANDRA GUPTHA (2020H1430025H)

Student write-up

PS-II project title: Design of Hydro projects

Short summary of work done during PS-II: Learnt how to do design and estimate heavy civils.

Tool used (Development tools - H/w, S/w): Staad pro and excel.

Objectives of the project: Hydro components design.

Major learning outcomes: Estimation and detailed design.

Details of papers / patents: Nothing

Brief description of working environment, expectations from the company: Its very good and highly important experience.

Academic courses relevant to the project: Yes

PS-II Station: Snapdeal - AI Project, Gurugram

Faculty

Name: Swarna Chaudhary

Student

Name: SHREYANSH GAUTAM (2017B4A40807G)

Student write-up

PS-II project title: Home Page and Retention Optimization

Short summary of work done during PS-II: Worked as product owner in Retention team in various projects where I managed cross-functional team and implemented various features on the homepage and in buyer's journey. I was also a stakeholder for the data that my team presented and I created, documented and managed the presentation of data to higher management.

Tool used (Development tools - H/w, S/w): Jira, Figma, Indiciium, Excel.

Objectives of the project: Improve retention rate of first time buyers by 10% from March to May with the help of various incentivization and gamification methods.

Major learning outcomes: Learnt to write clean, concise SQL queries to fetch and analyze data. Learnt to implement products end to end taking full accountability.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment is cool, the people are co-operative and friendly. They will help you if you face any difficulty in your journey.

Academic courses relevant to the project: DBMS, POM.

PS-II Station: Sona Comstar, Gurugram

Faculty

Name: Nithin Tom Mathew

Student

Name: CHITTA RANJAN SATAPATHY (2020H1410199H)

Student write-up

PS-II project title: High precision Laser Welding of Differential Assembly (EV)

Short summary of work done during PS-II: From a future commercial standpoint, conceptualized and built a Differential Assembly suitable for laser welding for a North American Electric car manufacturer. Sona Comstar will perform precision laser welding in engine components for the first time in India. Researching the most up-to-date laser welding techniques for dissimilar materials with high carbon content that can replace bolted joints with equivalent or higher torque and strength. Designing a weld bead, simulation, and sample preparation are the challenges.

Tool used (Development tools - H/w, S/w): Solid-Edge, Msc-Nastran.

Objectives of the project: Replace bolted joints with Laser Welding to reduce overall weight, increase torque carrying capacity, and enhance the NVH performance of the Differential Assembly, which is crucial in Electric Vehicles.

Major learning outcomes: I learnt a lot about important design and mechanics of a standard driveline and transmission system. Reading a design which is ready for manufacture, inspection procedures, and challenges to come up with a new product were some of the things I learnt.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is quite pleasant. Given the importance of this project and the company's commitment to providing cutting-edge technology, you must always be prepared to meet new challenges. Weekly presentations were given to keep track of how far we'd come each week, and this information was passed on to the customer for whom we were developing this new product. Unless you are a BITSIAN, not everyone has the chance to meet with the CEO every week.

Academic courses relevant to the project: Product design, Finite element analysis, Strength of material.

PS-II Station: Spectrum Techno Consultants Pvt. Ltd., Mumbai

Faculty

Name: Sonika Chandrakant Rathi

Student

Name: ADITYA DATTATRAYA GAITONDE (2020H1430032H)

Student write-up

PS-II project title: Analysis and Design of Substructures At Various Location For Sewri - Worli Elevated Connector (4 lane flyover)

Short summary of work done during PS-II: This project is a 4-lane flyover for which the following components like pile, pile cap, and pier are designed. The project also deals with the revision of certain substructures for which as-built coordinates from the site have been obtained. The revision generally involves checking the pile reinforcement and pile cap reinforcement. It also involves a change in the pile cap dimensions. Further, the drawing is sent to the proof checker and later the drawing is sent for casting at the site. There have also been certain eccentricities provided to counteract the moment due to curvatures. The pier has been shifted from alignment to counteract the moment due to curvatures. The weight of the launching girder is generally assumed in the highest case and further, the design is done for the worst-case scenario. In some cases, the superstructure is changed and the highest value of the launching girder is used. In this case, the pier is designed as 3 spans continuous on staad pro, and obtained live load reactions are used for design. The various substructures at the various locations are both of main alignment and ramp. All the site constraints are taken into account and the substructures are designed. The piers which are designed in this project are both free piers and fixed piers. All the piers are cantilever in nature. For all the cases maximum axial force, maximum longitudinal moment, and the maximum transverse moment is used for design purpose. Software used for design is ADSEC (mainly a section designer software) which is used to decide how much percentage of steel needs to be provided and the moment interaction ratio is checked for the same. Both pile and pier have been checked. In certain cases, if the seismic case is governing then the natural time period is found by modeling on STAAD and the displacement is found in the transverse and longitudinal direction. Various code books such as IRC 112: 2020, IRC 6: 2017, IRC-SP114 – 2014 and IS 2911 are used for designing purposes. The fixity length of the pile is obtained from IS 2911 codal procedure and further this length is used for calculating the maximum moment and natural time period. The pile cap is designed as a slab and the maximum axial force on the pile is obtained using rivet theory.

Tool used (Development tools - H/w, S/w): ADSEC, STAAD PRO V8i, MS EXCEL, AUTOCAD.

Objectives of the project: Provide designs as per clients requirement. Discuss the design with the proof checkers and get the drawings approved.

Major learning outcomes: Got exposure to industry. I got to work independently right from day 1. I was given complete responsibility of designing substructures and discuss with proof checkers if at all required. I was directly involved into designing of substructures at ramp locations, main alignment etc.

Details of papers / patents: IRC 112, IRC-6, IRC -SP114.

Brief description of working environment, expectations from the company: The company environment is very dynamic in nature. It is very good company to learn as a fresher. Direct responsibility will be given to you and it is expected that we work independently. The seniors are supportive and helpful in nature. The right guidance and feedback will be given. The work assigned to you will be challenging. So exposure you get as a fresher is just outstanding.

Academic courses relevant to the project: BRIDGE ENGINEERING, STRENGTH OF MATERIALS, STRUCTURAL ANALYSIS, RCC.

Name: VAISHAMPAYAN PRANAV MAHENDRA (2020H1430033H)

Student write-up

PS-II project title: Design of Pier for Sahibganj project & Design of Piercaps and Misc. structures for Mumbai Metro Line 6

Short summary of work done during PS-II: 1. Analysed various piers for Sahibganj project for different conditions. 2. Design of multiple piercaps for Mumbai metro line 6.- All the piercaps had different eccentricity wrt superstructure, different superstructure on both the spans, different bearing types, etc. 3. Wedge plate drawing preparation 4. Multiple comment compliances to the rejection letter received from proof checker.

Tool used (Development tools - H/w, S/w): MS-Excel, AutoCad, Staad Pro, ADSEC, SOFiSTiK.

Objectives of the project: 1. Analysis and design of pier in Sahibganj project 2. Design of various piercaps for MML-6 3. Wedge plate drawings 4. GFC drawing preparation 5. Comment compliances to the rejection letters received from proof checker.

Major learning outcomes: Understood organizational workflow of a design consultancy firm. Got introduced to IRS codes. Got to know about on-site challenges and design taking them into account.

Details of papers / patents: Referred various IRC, IRS and IS codes. Also referred various books such as by V.K. Raina, Venkat Ramaiha, Pillai and Menon, Holger and Svensson, etc.

Brief description of working environment, expectations from the company: A proper professional working environment. Company expect you to link your basic concept logic for simplest to complex problem. Rational behind the design carried needs to be clear. If any concept is new, then try to understand by self analyzing before seeking for help.

Academic courses relevant to the project: Yes. Relevant courses were Bridge engg., Earthquake engg., Dynamics of structures, Advanced structural analysis.

PS-II Station: SS Supply Chain Solutions, Pune

Faculty

Name: Sudeep Kumar Pradhan

Student

Name: PRATYUSH (2020H1030121P)

Student write-up

PS-II project title: descriptive and predictive analytics in supply chain

Short summary of work done during PS-II: I have been given responsibility of 5 dashboards of the company in which we needed to show the information about the various products of the company at various levels of visibility like sku, warehouse, region etc. I have coded the backend using python and used libraries like pandas, numpy etc and then used manipulation of sql to prepare tables that are to be used.

Tool used (Development tools - H/w, S/w): Python libraries like pandas, numpy, pyspark, sql, excel, power bi.

Objectives of the project: Using automation provided by azure suit to provide visibility of analytics to the company.

Major learning outcomes: Azure, Python, SQL, excel, handling large amount of data.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Working environment was nice, it is a startup so the working hours are not fixed and u would be involved in end to end development of the things.

Academic courses relevant to the project: Data mining, Machine learning.

Name: SWAPNIL AKASH (2020H1030133P)

Student write-up

PS-II project title: Demand Curve and OCR

Short summary of work done during PS-II: Trained in C# and .Net Core. Worked on a web application called Demand Curve as a full stack developer where I applied my training knowledge

of .net core and angular. I was mostly involved in the maintenance phase of this product where I fixed some major UI bugs as well as optimised code for the backend. During the end phase of my PS, I have been working on developing an OCR engine that will extract relevant data from Invoice PDFs by first converting them to images.

Tool used (Development tools - H/w, S/w): Visual Studio 2019, Visual Studio Code, Anaconda, Jupyter Notebook.

Objectives of the project: Build a client facing web application. Apply data science skills to build an OCR engine.

Major learning outcomes: Learnt C#, .NET CORE, Entity Framework Core and Angular. Applied Python skills to develop an OCR engine.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment of the company is good. Good team culture present. Everyone out here is friendly and will help out when needed. Company is looking to add more technology fields in the upcoming months, out of which Data Engineering field is what I am most interested in.

Academic courses relevant to the project: Object Oriented Analysis and Design, Software Architectures.

Name: SUDHANSHU VINAYAK GIRADKAR (2020H1060258H)

Student write-up

PS-II project title: Operation Analytics In the Supply Chain

Short summary of work done during PS-II: The company works in the application as well as for the analytics side of the Supply chain for various companies. I am working in the Analytics

department of the company, which focuses on doing Operational, Descriptive and Predictive analyses for various companies.

Tool used (Development tools - H/w, S/w): SQL, PYTHON, POWER BI, EXCEL.

Objectives of the project: Objective is to get clarity about data and also, provides forecasting of sales data, inventory, and CBO data for various SKUs.

Major learning outcomes: Data Validation, Data Cleansing, SQL, Power BI, etc.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: 3SC (SS Supply Chain Solutions Pvt Ltd), is a Gurugram-based supply chain, planning, and logistics company. The company aims at reducing the operational costs of the companies by giving them advanced analytics-based solutions. The company is a bootstrap company that was started by Mr. Lalit Das and Mrs. Sarita Das. The company provides mainly three kinds of services first is the operational side of the supply chain wherein the company owns warehouses and uses them to provide end-to-end supply chain solutions like transport warehousing, analytics, etc. The second type, Product segments: three of the flagship products made by the company are: 1. Demand Curve is focused on demand forecasting, providing the demands for the upcoming periods based on historic data. 2. PL Visilog plays the role of an orchestrating tool that enhances supply chain visibility and streamlines communication between multiple stakeholders. 3. Dispatch X Distribution planning tool. And Third is Collaborative Demand Portal for efficient sales planning lastly company also provides analytics as a service Workforce size is around 383 as per my date of joining.

Academic courses relevant to the project: Supply Chain Management.

PS-II Station: Strand Life Sciences Pvt. Ltd., Bengaluru

Faculty

Name: Bharathi R

Student

Name: SURAJ KUMAR SHARMA (2020H1290003H)

Student write-up

PS-II project title: RNA sequence analysis using strandngs 4.0

Short summary of work done during PS-II: Worked on learning programming skill for Linux bash and R language., then learned the annotation techniques, pipelines for DNaseq, RNAseq, MethSeq, ChIPseq and worked project on the RNA seq analysis and co-expression analysis. Sequencing of RNA or RNA-Seq, is now a standard method to analyze gene expression and uncover novel RNA species. Common bottlenose dolphins serve as custodians for the health status of their coastal regions as per they are vulnerable to health impacts from anthropogenic contamination through their feeding habitat, and direct exposure to contamination leads to biomagnification. RNA sequencing was employed on the skin transcriptome of 116 bottlenose dolphin's samples. The gene expression level was identified with conditional variations in the samples, such as season, location, and sex. Most of the significant genes show higher variation in the seasonal variation. Identify substantial conditions for the highly differentially expressed genes and gene co-expression analysis. Determining the cause of cardiac muscle contractions due to overexpression of the troponin in the warmer season and the reason for overexpression which ultimately causes capture myopathy leads to the death of cetaceans in the warmer season.

Tool used (Development tools - H/w, S/w): STRANDNGS 4.0, Linux bash command, R studio, R language, MS PowerPoint, MS word.

Objectives of the project: To study differential gene expression in Dolphins on various parameters like - Season, Location and Gender in Strand NGS v 4.0. To perform gene co-

expression analysis using the WGCNA package in R To understand the major cause of cetaceans death in the war.

Major learning outcomes: Learnt Linux bash command along with R scripting. Acquired skills of using bash and python commands for the creation of annotation files and uploading to server. Analysis of NGS data and understanding of annotation pipeline for RNA sequencing data. Acquired knowledge on alignment, data quantification, DESeq normalization, analyzing genes by using genome browser, determining variants in transcripts and detection of the novel spliced regions using Gene view. Learnt statistical techniques for the analysis like t-test, z-test, one and two-way ANOVA, DESeq2, and edgeR scripts. Gained an understanding of Gene Ontology (GO) and pathway analysis. Understood the concept of WGCNA for exploring the relationships between different gene sets (modules) on normalized count data in R studio.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Completing practice school in such a great organization, provide a good work culture and work life balance in Strand Lifesciences. Their is flexible working hour in between 8:00 AM- 11:00 PM in between. Extreme support and guidance were provided from the team and mentors. All the project assigned to me and the details were explained by the mentor and team members also. On daily basis standup meeting is there for doubt clearance and updates on projects.

Academic courses relevant to the project: Biostatistics and Biomodelling, Molecular biology, Bioinformatic, Sequencing technique.

Name: SHIVANI SRIVASTAVA (2020H1290004H)

Student write-up

PS-II project title: Competitive analysis and Curation of cancer database

Short summary of work done during PS-II: Cancer arises when normal cells progress from a precancerous lesion to a malignant tumor, in a multistep process. It is the leading cause of death worldwide, accounting for nearly one in six deaths, which demands better treatment options. Precision medicines hold great potential for the treatment of various solid and hematological cancers. This present study aims at performing an exhaustive competitive analysis and curation of the cancer database. For the competitive intelligence survey, the top 20 somatic cancer knowledge bases or tools were selected. Feature by feature comparison of StrandOmics/IRIS was performed with other knowledge bases or tools. Features such as the combined effect of variants, a wide spectrum of treatment options, a curated summary, a list of clinical trials, etc are the highlights of Strand's tool. Medical history of patients, report summary snapshot, pathway view, etc. are additional features of other cancer Knowledge bases or tools in the market that could be included to complement strand's tool. For database curation, a comprehensive screening of research articles was done on search engines, to point out various functional, therapeutic and prognostic evidence, and statements were drafted. Biomarker-specific curation provides treatment options according to patients' genetic profiles and thus, boosts the treatment.

Tool used (Development tools - H/w, S/w): Microsoft Excel, Microsoft Powerpoint.

Objectives of the project: (1) Competitive intelligence survey on StrandOmics / IRIS for business development (2) Curation of a somatic cancer database.

Major learning outcomes: Insights into top somatic cancer reporting tools/KBs in the market, Distinguished features of Strand Omics/IRIS, Additional features of other somatic cancer reporting tools/KBs, Major hallmarks of cancer, pathways in cancer, targeted therapy and various functional assays in Solid and Hematological Cancers, Use of keywords or strings to screen out Biomarker relevant research papers on search engines such as Google Scholar, Google, OncoKB and JAX CKB, understood various aspects of cancer knowledge base curation.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Strand Life sciences provide a great work culture with complete work-life balance. Team members and the lead were extremely supportive. All the details of the project were explained very well by the team members and the doubts were resolved in an elaborative way.

Academic courses relevant to the project: Biomodelling, Cancer Biology.

Name: NISHA K (2020H1290007G)

Student write-up

PS-II project title: Curation of scientific literature, clinical interpretation and reporting for inherited disease

Short summary of work done during PS-II: Germline cancers are called inherited cancers patients. Genetic counselling can be given to the patients and their family members in case of possibility of cancer and precautionary measures to control the condition can also be decided. and can be passed down from generation to generation. Different variants of the same gene are created in the event of a mutation that alters the normal DNA sequence. These variants can be studied and interpreted to know their involvement in causing cancer. For interpreting the variants, we use different tools and databases and based on it, the variants can be classified as pathogenic or benign or variant of uncertain significance depending upon the ACMG guidelines. This allows us to know the effect of the variants on the patients and also on their family members. Then we create a report with the label of the variant and how it may affect the patient and recommendations to the patient. This work plays a major role in deciding personalized healthcare and future course of treatment for the cancer.

Tool used (Development tools - H/w, S/w): Company software, MS Excel.

Objectives of the project: Analysis and interpretation of genomic data generated through the Next Generation DNA sequencing (NGS) of germline samples, associated with the risk of hereditary cancers.

Major learning outcomes: A thorough understanding of the interpretation of sequence variants, variant classification based on the ACMG guidelines, and the creation of individual reports.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Strand Lifesciences is a great place to work with very supportive peers and guides. There are different teams such as research informatics, clinical research and clinical diagnostics that work together to develop newer products keeping in mind the needs of physicians and patients. At Strand, everybody is considered to be equivalent, be it the head of a team or an intern. Equality is maintained and knowledge sharing happens in all the ways. Dedication and the willingness to learn new things every day are some of the most important qualities that are expected here.

Academic courses relevant to the project: Yes

Name: BURUGUPALLI VENKATA SATYA DEVI (2020H1290008H)

Student write-up

PS-II project title: Transcriptional analysis(RNA Seq analysis) of Clostridium Acetobutylicum to study Arabinose- Induced Catabolite Repression using StrandNGS

Short summary of work done during PS-II: A reference paper was chosen which deals with pentose hierarchy induced by Arabinose in Clostridium acetobutylicum strain. In this study they performed RNA-Seq data which shows the genes responsible for the phenomenon and the data also shows heriarchial clustering of the experimental samples and other supporting data. In this project we obtain data from the reference and replicate analysis and add some additional analysis to support the data given using Strand NGS. This whole project deals with the usage of strand NGS for data analysis and also concentrates on the importance of the study in scientific community.

Tool used (Development tools - H/w, S/w): Strand NGS, RegPrecise and Python & R scripts.

Objectives of the project: To determine the mechanisms responsible for pentose hierarchy in Clostridium species using RNA seq analysis.

Major learning outcomes: Omics Data analysis particularly RNA- Seq data analysis.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment of Strand Life sciences was very supportive. Due to pandemic, whole project was dealt in work from home mode. Although this is advantageous due to health concerns, I believe work from the office would be more effective. I was allotted NGS team, everyone were interactive and supportive. They trained me in NGS analysis and made me confident in it.

Academic courses relevant to the project: Bioinformatics, Molecular mechanisms of Gene Expression.

Name: MEHAK SOOD (2020H1290014G)

Student write-up

PS-II project title: Curation of Scientific Literature, Clinical Interpretation and Reporting for Inherited Disease

Short summary of work done during PS-II: The workflow includes standard differential expression analysis for different experimental conditions. Project work includes the curation of scientific literature, identification and selection of different types of variants, such as SNV (single nucleotide variants), CNV (copy number variants), indel (small deletion, duplication and insertion) and structural variants, variant curation, interpretation based on ACMG guidelines and preparation of genetic reports. The first step is resolving a case, which focuses on retrieving relevant data from the pathological reports and prescriptions of a patient to establish a base for the next steps. It is performed to determine the gene list associated with the patient's clinical indication and/or family history. Then clinical interpretation of germline cancer cases is performed using the StrandOMS software. The interpretation setup allows filtering and evaluation of variants. Variants need to be screened for their quality and clinical significance and are selected based on the quality filters and associated disease. Genes are filtered based on various parameters as well

as the most relevant pathogenicity labels. Database and literature search is performed along with an in silico estimation of the variant impact determining the variant label ranging from 'pathogenic' to 'benign'. The 'pathogenic', 'likely pathogenic' and 'VUS' variants are selected for reporting, and a report is created with the details such as the patient's clinical indication, interpretation summary and variant summary for the reported variant and recommendations based on the individual's personal and/or family history of cancer. The report also includes recommendations to the clinician to further inform about variant interpretation.

Tool used (Development tools - H/w, S/w): StrandOMS software.

Objectives of the project: The project aims at the analysis and interpretation of genomic data generated through the Next Generation DNA Sequencing (NGS) of the germline samples, associated with the risk of hereditary cancers.

Major learning outcomes: The project requires a thorough understanding of StrandOMS software, familiarity with ACMG guidelines, and learning to interpret and analyse variants obtained after Next- Generation Sequencing of samples like blood and saliva. The expected result at the end of this project is to gather information and gain knowledge regarding the process of variant interpretation, understand the ACMG guidelines for generating variant labels, preparing a complete report comprising of the bioinformatics, population and literature summaries pertaining to the variant based on the company software and learn the concept of genetic testing and diagnosis. The tests performed and interpreted as part of this project provide information to identify and estimate the risk for cancer predisposition.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The company has an amicable environment with exceptional work-life balance. The employees are very friendly and engage in a positive way throughout the workday. This company encourages to explore the full potential of its employees skill sets, and one can grow through the job experience. It is an inspiring place of work and has an enriching culture. Employees are very collaborative and cooperative. I would expect an opportunity to widen my skillset with such a driven and stimulating environment.

Academic courses relevant to the project: Yes

Name: KETAKI RAMESH KARMALKAR (2020H1290019G)

Student write-up

PS-II project title: Curation of Scientific Literature, Clinical Interpretation and Reporting for Inherited Disease

Short summary of work done during PS-II: We used Next generation sequencing (NGS) as it is an all-in-one platform that can detect several types of variants in the DNA sequence. The data generated with NGS was construed in context of the affected status and cancer type of the patient. The interpretation of the NGS data entailed labelling the sequence variants found in an individual by following the American College of Medical Genetics (ACMG) guidelines. Along with this, bioinformatics data, literature and population studies were referred to as evidence to back up the variant label. After the data was interpreted, it was presented in form of a report with all the evidence for variant label accompanying it.

Tool used (Development tools - H/w, S/w): Company software, Excel.

Objectives of the project: Interpretation and analysis of sequence variants in germline cancer; Reporting these variants with respect to the cancer type of patient.

Major learning outcomes: Understanding of the interpretation of sequence variants; variant classification based on the ACMG guidelines; creation of individual reports.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Strand Life Sciences is a great organization for anyone looking to gain experience in the field of genomics. I had flexible working hours. My mentors and seniors were extremely helpful. Interns were encouraged to ask questions.

Academic courses relevant to the project: Yes

PS-II Station: Syneos Health, Gurugram

Faculty

Name: Bharathi R

Student

Name: KARTHIK Y G (2020H1080318P)

Student write-up

PS-II project title: Conducting systematic literature review based on pharmaceutical clients requirements for a therapeutic area or an intervention

Short summary of work done during PS-II: The work was based on different steps involved in conducting systematic literature review. To assess the studies identified by the search strategy to decide if they meet the inclusion criteria as per client. This step is usually performed in two stages: a first stage where screening of titles and abstracts (often thousands of them) and a second stage where they screen the full texts that were not excluded in the first stage. Using a pre-defined method for assessing the quality of included studies. Various tools exist for this stage. Using a pre-defined form to extract the data of interest from each included study. Again, usually performed by two reviewers in parallel. Using a pre-defined method to analyse the data and synthesize the information from included studies. Perform sensitivity analysis if possible.

Tool used (Development tools - H/w, S/w): MS Excel, MS PowerPoint, MS Word.

Objectives of the project: Systematic reviews are often applied in the biomedical or healthcare context, they can be used in other areas where an assessment of a precisely defined subject would be helpful. Systematic reviews may examine clinical tests, public health interventions.

Major learning outcomes: Conducting systematic literature review, targeted literature review.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Syneos health is a great place to work. The onboarding was very welcoming and the transition from college to company environment was smooth. The company has productive environment which enabled me work with minimal distractions, stay on task and accomplish more of my daily responsibilities. Company promotes open and honest communication which helped in getting my opinions out and providing constructive feedback. The company has very good work life balance and very supportive colleagues.

Academic courses relevant to the project: Clinical research, Quality assurance and regulatory affairs.

Name: ISHBAH HILAL (2020H1290018P)

Student write-up

PS-II project title: Growth-Based Analysis of Partnership Models in the Pharmaceutical Industry

Short summary of work done during PS-II: I undertook the task of cleaning up and analysing vendor data along with conducting secondary research to classify the business and partnership strategies of pharmaceutical companies.

Tool used (Development tools - H/w, S/w): Advanced Excel and Power Point.

Objectives of the project: The project aims to understand the dynamics between different pharmaceutical companies. The parameters of this study focus on the partnership models companies have while they are in the Mid-Cap segmentation and the effect these partnerships may have on the effect.

Major learning outcomes: While doing the task I learnt about structuring and planning a project, the need for quality checks. I gained a better understanding of Excel and data analysis. I learnt significantly about the pharmaceutical industry along with gaining deeper understanding of certain companies and their working models.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work culture is the most amazing thing about Syneos Health. They have really great training and development structures to make things easier for everyone. The leadership is very approachable and guides you. They make the steep learning curve of consulting a little easier to manage.

Academic courses relevant to the project: Bioethics and Biosafety, Human genetics, Stem cell Technologies, RDT, Cancer Biology.

Name: UNNATI BATRA (2020H1460343P)

Student write-up

PS-II project title: Medical Affairs support for the development of patient journey and medical value story for an oncology-based diagnostic product

Short summary of work done during PS-II: In the whole span of PS-II, I worked on two minor and one major project. I also went through several training sessions with industry leaders, along with on-the-job training through live projects. The trainings were scheduled from time to time and were evenly spaced. The work on the projects majorly included secondary market research. Compiling, analyzing, filtering, and cleaning data were major tasks to accomplish during a project.

With this, market search and competitive analysis were also done for the client's product. With the project on the development of patient journey, the work included the collection of relevant data in order to frame a mapped patient journey of an oncologic diagnostic product. The medical value story was developed to conclude all the relevant clinical studies done on the client's product in order to educate the HCPs regarding the product before its planned launch. All the information collected related to the product and its existing competitors in the market was analyzed and presented to the client in the form of deliverables.

Tool used (Development tools - H/w, S/w): Microsoft Excel, Microsoft PowerPoint, KOMODO software, Power-User, VOS Viewer, PowerBI, Power Automate, and Several Data searching, segregation, gathering, and presenting software were used in live projects.

Objectives of the project: The project aimed to develop a summarized patient journey by mapping the oncology diagnostic product within the market across all stakeholders that could possibly be involved. Along with this, the project focused on developing a medical value story about pharmaceutical industry.

Major learning outcomes: The project on patient journey mapping and medical value story development, which occurred during PS-II helped me to understand the basics of data collection, compilation, and presentation. The basics of data analysis were a key outcome of learning from this work. I learned the ways in which an oncologic diagnostic product is launched in the U.S. market. A few aspects of market research like pipeline development, market overview of existing products, and competitive assessment helped me to learn the basics of the commercial advisory group. I got a deeper understanding of the ways to pull up the required data from an existing pool of large data. Learnings include: ways to execute and attend client meetings, how to deliver a project and various training that led to a good foundation in consulting and corporate. The trainings covered several critical aspects of consulting, including market research (primary and secondary), data modeling, consulting frameworks, and report writing.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment at Syneos Health is commendable. The people at Syneos Health are inspiring and very helpful. Even with the remote working, there was no sense of any communication gaps, and

all the doubts, a trainee might have been cleared with utmost patience. The work at this organization is very flexible and this gives a sense of responsibility and importance to each employee. The organization engages its resources in the best way, and there is no overloading to any of the employees. This sets the best example of a good working environment. Syneos Health trusts its people, supports them, and cooperates with them in all cases. Each individual employee is assigned a professional development coach, who is there to solve all their queries and help to grow them professionally. Apart from this, local mentors are assigned individually which helps each employee to grow in their own way. There is a proper work-life balance and a healthy work relationship meets an employee's expectations here at Syneos Health.

Academic courses relevant to the project: Academic courses were relevant for both building an understanding of the project and executing the project. To name a few- Clinical Research (CR), Pharmaceutical Administration and Management (PAM) and Quality Assurance and Regulatory Affairs (QARA).

Name: SAMRIDHI JOHRI (2020H1470333P)

Student write-up

PS-II project title: Market Forecasting and Validation

Short summary of work done during PS-II: Dynamic range of work was done during the entire session of PS-II. It helped in determining the commercial consultancy part of the pharmaceutical business. From assessing the pipeline of the client to developing the current and future portfolio, from supporting on the redaction work to deciphering the market caps of bio-pharma companies in the last decade and predicting the market revenue based on sales and therapeutic area in the next decade, the environment of learning had been vast. In these experiences, the major experience came from the crucial work, that is, market forecasting. Here, the client forecasted the revenue number for its product to be launched in next 5 years and then its validation was required by forecasting the revenue by following our own method. Briefly, the procedure was to first determine the essential market parameters, then search for the values in specific countries and calculate the Year on year growth respectively. Applied market formulas to derive the final figure

and validate the method and check for accuracy, so that the client can move ahead with product launching plan.

Tool used (Development tools - H/w, S/w): Excel, PowerPoint and organization's proprietary databases.

Objectives of the project: To generate revenue figure of the client project in the launch year and the peak year, within US, EU and Japan.

Major learning outcomes: Important market variables required to calculate the market estimation of a product which is in early stage clinical development, determining the target population, analyzing the trends in the countries and growing prevalence of the disorder, etc.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Syneos Health, has one of the most constructive environment ever, that's what was promised and that's the exact thing encountered. As an intern, one expect to learn as much as he/she can, work on different projects, so that the working didn't become boring and keeps you engaged so much, that it drives away your mind from anything else, and its all here in Syneos. All expectations were met, be it dynamic work coming in the way, constant assignment of work, with regular breaks given in between projects to relax, supportive environment and understanding mentors and managers. Working culture is exceptional and different from other big cooperate names, feedbacks from managers, stakeholders and clients boosts the confidence and changes you as a person, to become a better version of yourself than ever. Its a dream come true to work in Syneos.

Academic courses relevant to the project: Partially, non core subjects were more relevant, as compared to the core subjects.

PS-II Station: Tata Advanced Systems, Noida

Faculty

Name: Nithin Tom Mathew

Student

Name: SWAPNIL PRANAVKUMAR MISTRY (2020H1410085G)

Student write-up

PS-II project title: Stress and Manufacturing Analysis of Boeing 737 Max Vfin

Short summary of work done during PS-II: I was allotted the 737 Max Vertical fin Assembly at Tata Boeing Aerospace Limited. I started with the basics of stress calculations and learnt what is the functioning of Material Review Board (MRB) in Aerospace industry. Worked closely with the manufacturing engineering team responsible for various operations involved through the assembly line, was involved in several stages of documents necessary. For the most part I worked on APQP (Advanced Product Quality Planning) which is a very important tool for risk assessment, process improvement and Design for Six Sigma. Had to implement the already created APQP data to a new software and look for further improvements in the APQP implementation. Attended necessary training webinars to understand the process.

Tool used (Development tools - H/w, S/w): Omnex EwQIMS, JT2go, CATIA, MS Office.

Objectives of the project: To study the basics of stress calculations and the operations involved in Aero structure Assembly.

Major learning outcomes: Strong Design, Manufacturing and Operation exposure in an Aero structure assembly line. Learnt how design changes are flown down, important components of an Aero structure Assembly, APQP (Advanced Product Quality Planning).

Details of papers / patents: NA

Brief description of working environment, expectations from the company: I was given time to learn and understand new things. The expectations were high, and I was always given my freedom to think and do it the right way. I was provided with the necessary support needed during my task and there were periodic reviews to keep me aligned.

Academic courses relevant to the project: Material Testing and Technology, FEM, Product Design, Machine tool engineering, CAAD.

PS-II Station: Tecture Structures Pvt. Ltd., Nagpur

Faculty

Name: Pavan Kumar Potdar

Student

Name: SRAVAN RAVOORI (2020H1300094P)

Student write-up

PS-II project title: Building Information modelling

Short summary of work done during PS-II: We had extracted the sheets from the 3D model that had been provided by the the 3D modelling team for the implimentation of work at site.

Tool used (Development tools - H/w, S/w): S/w Revit, Naviswork, Civil3d, Autocad.

Objectives of the project: To get thought the BIM Industry.

Major learning outcomes: Revit software operation, team work.

Details of papers / patents: Building information modelling.

Brief description of working environment, expectations from the company: Working environment is better, team members were co-operative, company will be better to exposure for the BIM INDUSTRY.

Academic courses relevant to the project: No academic courses were relevant to the work at company.

PS-II Station: Tega Industries, Kolkata

Faculty

Name: Arun Maity

Student

Name: PRANAY KATIYAR (2020H1060132G)

Student write-up

PS-II project title: Digitalization and Industry 4.0

Short summary of work done during PS-II: First of all I saw all the operations that is going in the plant and examine each and every operations deeply and collect the required data which was required to make scheduling logic, schedule output and constraints required by the software company who is helping us on this project in order to make logic and algorithms on the basis of this scheduling logic.

Tool used (Development tools - H/w, S/w): SAP, MS EXCEL and MS WORD SOFTWARE.

Objectives of the project: Implementation of Industry 4.0 in an efficient way.

Major learning outcomes: I learnt how to interact with the company stakeholders and how to represent yourself in front of them and also learnt the working of company in deep.

Details of papers / patents: Paper on digitalization of industry 4.0 which includes the information of software in which we are working on for making planning and scheduling takes place through this software only with minimal manual intervention and details regarding the internet of things.

Brief description of working environment, expectations from the company: Working environment is very good and company staff is also very friendly.

Academic courses relevant to the project: Yes

PS-II Station: Tega Industries SEZ Ltd., Dahej

Faculty

Name: Arun Maity

Student

Name: ADITYA RAJ ANAND (2020H1410184H)

Student write-up

PS-II project title: Manufacturing excellence in press and mould shop

Short summary of work done during PS-II: Over the period of 143 days at Tega Industries, my work spans across the 4 projects. The first project was to ascertain the same time opening of

press which was ascertained and an action plan was proposed. The projects success is comes with the installation of new CFE machine which was one of the suggestions provided. The Second project was Lean 5S implementation in mould Shop, My work lays the foundation in terms of the process flow for other inventory items. I have developed a rack area with the SI inventory and ensured sustainability by assigning dedicated manpower for handling the inventory flow of that area. The Third project was Data Analysis of Re-blasting. My work in this project provides a preliminary investigatory report to the Re-blasting team to act upon and have benefits in terms of Monetary, Quality. Impinge paint/adhesive. The Fourth project is based on performing Time and Motion Study in Mould shop, development of a seamless process flow and establishment of benchmark parameters. The Project discussion is under way and updates will be reflected in the report after the term ends.

Tool used (Development tools - H/w, S/w): Ms Word, Ms Ppt, Ms Excel, Minitab, SAP.

Objectives of the project: 1. Ascertain Same Time Opening in Press Shop 2. Lean 5S Implementation in Mould Shop. 3. Data Analysis of Re-Blasting Data to ascertain the main contributors in Re blasting.

Major learning outcomes: 1. An understanding of types of products manufactured in press shop,
a. Lifter Bar b. Shell Plate c. Head Plate d. Grate plate/ Pebble Plate e. Combi liner (Dyna Prime)
f. Filling Segment/ Support Segment
2. Lean Principles, Methodology and Significance of 5S
3. Develop an Understanding of Process Flow
4. Development of observation skills and lean thinking whilst searching for Kaizen
5. Lead a team to implement 5S in Mould Shop and motivated them to sustain the practice in order to achieve Lean Production
6. Learned basic SAP Codes and SAP Software
7. Learned Advance Excel and basics of Visual Code
8. Learnt Minitab
9. Learnt about blasting techniques process and its importance
10. Learnt about importance of RCA with help of live data

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was very supportive and encouraging and harmonious with we having our moments. Expectations from the company is to provide same kind of encouragement to other level of workers and introduce perks, training amongst other systems for its employees across the level in order to enhance its productivity.

Academic courses relevant to the project: Manufacturing Engineering, Industrial Engineering.

Name: SHAH AAGAM GAUTAMBHAI (2020H1410209H)

Student write-up

PS-II project title: Industry 4.0 and digitalization

Short summary of work done during PS-II: Learnt SAP, Routing for fabrication processes, Time study of Fabrication process, Data collection required for IOT project.

Tool used (Development tools - H/w, S/w): SAP.

Objectives of the project: •To digitalize & optimize the day-to-day activities occurring in the plant from purchase of raw material to the production of final good • To fulfill the business perspective with managing the resources • To maximize the profit with the help of IOT based.

Major learning outcomes: Industrial standards, working of plant, soft skills.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is comfortable, everyone is very supportive, major staff is of young engineers so enthusiasm, energy and fun is maintained, cleanliness is also maintained.

Academic courses relevant to the project: Industrial engineering, Manufacturing processes, Production and plant management.

PS-II Station: Tejas Networks, Bengaluru

Faculty

Name: Chennupati Rakesh Prasanna

Student

Name: RAHUL VEERAVELLI (2020H1230318H)

Student write-up

PS-II project title: Testing of ONT boards

Short summary of work done during PS-II: During the first 45 days, we were trained on various concepts. Later, we were given couple of assignments. Post that I was assigned to a manager. Tested the ONT boards in normal and elevated temperatures.

Tool used (Development tools - H/w, S/w): Cadence Alegro, Xilinx Vivado.

Objectives of the project: Design, Verification and Testing of Optical Network Terminal Boards.

Major learning outcomes: Understood the VLSI flow of ONTs and how the ONTs are designed and developed.

Details of papers / patents: None

Brief description of working environment, expectations from the company: I have mostly worked in the lab in Tejas networks, the colleagues are very supportive and helpful. The company expects the students to be strong with their fundamentals.

Academic courses relevant to the project: CAD for IC Design, Digital Electronics, Verilog.

Name: SHIVAM KUMAR (2020H1400114G)

Student write-up

PS-II project title: Implementation of 4x4 Cross bar Switch and Study of Nano-16 Card

Short summary of work done during PS-II: FPGA training and study of Nano-16 Base card of TJ-1400 Node.

Tool used (Development tools - H/w, S/w): Vivado, Questa Sim.

Objectives of the project: To learn basics of telecom related hardware concepts.

Major learning outcomes: I learnt a lot about real time work in industry.

Details of papers / patents: No such details.

Brief description of working environment, expectations from the company: Good working environment.

Academic courses relevant to the project: Yes

PS-II Station: Tekion India Pvt. Ltd., Bengaluru

Faculty

Name: Pradheep Kumar K

Student

Name: VIDIT LOHIA (2017B3A70632G)

Student write-up

PS-II project title: MPVI Application

Short summary of work done during PS-II: Aided in development of mobile application that would be a addition in the product line of the company aiming to enhance automotive experience for the OEMs, dealers and the end consumer.

Tool used (Development tools - H/w, S/w): Java, Git, React, React-native, Javascript, Spring.

Objectives of the project: To make a mobile application which enables MPVI support provided on site at automobile dealerships.

Major learning outcomes: Full stack technology development.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment is very supportive and full of experienced professionals.

Academic courses relevant to the project: OOPS, DSA, POPL.

PS-II Station: Teradata India Pvt. Ltd., Hyderabad

Faculty

Name: Anindya Neogi

Student

Name: NISHANT VERMA (2020H1030056G)

Student write-up

PS-II project title: Automating SSO onboarding process

Short summary of work done during PS-II: I worked on several functionalities along with POC on the cloud security services. I got an opportunity to work on the AWS lambdas.

Tool used (Development tools - H/w, S/w): Postman, VS-Code, Github, VMs.

Objectives of the project: Work on SSO to make system more secure and automate processes for easy customer on boarding process.

Major learning outcomes: Cloud -IAM, Protocols like SAML, OIDC, JWT, OAuth, Languages like GO, Rest APIs, Tools like Vs-Code, github AWS, Docker.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: You have to explore everything on your own and come out with a solution. This was a R&D kind of project so the expectation was really high and to meet that expectation you need to put a lot of efforts.

Academic courses relevant to the project: Network Security in which I learnt the basics of DSA, AES, SHA etc. This helped me in understanding better.

Name: SHIVAM KUMAR (2020H1030060G)

Student write-up

PS-II project title: Service Fix and Create Stories, Benchmarking & Comparing SNS and Kafka

Short summary of work done during PS-II: 1. I have created a Pub/Sub model which is capable of sending notification or message from publisher to subscriber. 2. I have created a service in Systemd which automatically restart or self healing the process on service failure . Also I have suggested the alternative for service running in background 3. I have updated all the http timeout using enums which makes service more dynamic to update. 4. I have explored how Terragrunt used with Terraform.

Tool used (Development tools - H/w, S/w): Putty, Vantage, Terraform, Teragrunt, AWS, Apache Kafka.

Objectives of the project: To understand how DRaaS service works, how to automatically restart the service once it stopped, update all the http timeouts using enums, using Terragrunt with Terraform to manage multiple environments and Pub/Sub model using SNS and Kafka.

Major learning outcomes: 1. Got to know how things works in the Corporate world from team management to work ethics.

2. I have learnt how backup is taken on the major scale. As Teradata stores data in Petabyte

3. How to build Publisher/Subscriber application using SNS and Kafka

4. How to Make system more Resilient

5. How to run services in the background

6. How to write services to run any activity

7. How to best use enums

8. What Terragrunt is capable of doing, How it benefits the Terraform

Details of papers / patents: There is no papers / patents.

Brief description of working environment, expectations from the company: Working environment is pretty good. I can reach out to anyone in the team at any time. Everyone is helpful. Sometimes I got stuck in some problem, then i reach out to any developer. Most of the time they helped me. Everything was amazing whatever I expected.

Academic courses relevant to the project: Cloud Computing, Network Security.

Name: KESAVARAGAVAN B (2020H1030145H)

Student write-up

PS-II project title: Workflow creation for teradataml dataframe and teradata sagemaker

Short summary of work done during PS-II: I worked on three team which all related to machine learning, analytics, aws API. I created multiple workflows to provide support to end_user of teradataml packages. I was free to choose between teams and projects. Majority time created notebooks for BYOM architecture and Sagemaker deployment workflow. Finally, worked on pytest framework to test 25 different window aggregate function provided by teradata.

Tool used (Development tools - H/w, S/w): Notebook, aws, pytest, h2o, scikit learn, hugging face, keras, tensor, chainer, pytorch, xgboost.

Objectives of the project: Creating multiple workflows for supporting teradataml package users and created different ml framework for teradata sagemaker.

Major learning outcomes: Industrial experience, Creating machine learning workflow with help of teradataml packages. understood BYOM and Sagemaker architecture and workflows.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: I worked as SDE in teradataml package. Work balance was very good and Got lot more exposure to the work environment. Mentors were supportive through out the internship period. I expected lot more work toward data science but received related projects.

Academic courses relevant to the project: Yes, Academic was very much helpful in many places.

Name: PRATIK SHASHIKANTBHAI PATEL (2020H1030164H)

Student write-up

PS-II project title: Training on Teradata Database Product

Short summary of work done during PS-II: Started with the understanding of RDBMS and then jump to understand the architecture of the Teradata Database Product; It contains thousands of files. After that I worked on the static code analysis issues popped out in new release of database version. Then at the end I worked on one Defect Report and solve it.

Tool used (Development tools - H/w, S/w): JIRA, Darts, Coverity, Github, Virtual Machine.

Objectives of the project: Understanding the architecture and working of all the components of Teradata architecture.

Major learning outcomes: Understand the Teradata database architecture and understand how to solve the Defect Reports.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is very good and very friendly; As per my experience the seniors just want us to first learn more and more things so we can do work properly in future.

Academic courses relevant to the project: NA

PS-II Station: Texas Instruments (I) Pvt. Ltd., - Systems, Bengaluru

Faculty

Name: Satya Sudhakar Yedlapalli

Student

Name: R HARISHANKAR (2018AAPS0392G)

Student write-up

PS-II project title: Evaluation of Digital Pre-Distortion Models for high Bandwidth Power Amplifiers

Short summary of work done during PS-II: My project involved designing algorithms to effectively model non-linearity present in RF power amplifiers so that an effective pre-distorter can be designed to compensate for the non-linearity.

Tool used (Development tools - H/w, S/w): MATLAB, tensorflow.

Objectives of the project: To explore algorithms to accurately model Non-linearity in Power amplifiers.

Major learning outcomes: Learnt about various signal processing techniques, filter designing and Machine learning techniques.

Details of papers / patents: NIL

Brief description of working environment, expectations from the company: I was very comfortable with the working environment at TI. The mentors encourage you to explore new ideas and regularly discuss ideas with you which helps develop critical thinking. My project involved reading a lot of research articles and implementing those in MATLAB, so experience in reading research papers and figuring out which ones are relevant could help save a lot of time.

Academic courses relevant to the project: DSP, COMMSYS, SAS.

PS-II Station: Texas Instruments (I) Pvt. Ltd., -Analog, Bengaluru

Faculty

Name: Satya Sudhakar Yedlapalli

Student

Name: SWAGAT PANDA (2017B5A30983P)

Student write-up

PS-II project title: Optimising a high speed Opamp Buffer for a D to A converter

Short summary of work done during PS-II: The project was aimed at optimizing the design of an opamp which was to be used in a D to A converter, and then analyze, document the issues that are common and may be observed in other applications using an operational amplifier. The

design optimization also involved exploring other designs and stages, which were then compared and documented for advantages and drawbacks. The design methodology was elaborated in a way that can be extended to analyze other design approaches as which use operational amplifiers in a different manner.

Tool used (Development tools - H/w, S/w): Cadence virtuoso, Spectre ADE explorer and assembler, Unix.

Objectives of the project: This project aims to optimise an existing opamp design as per the operating conditions, process variations and predefined specifications. The opamp consists of two stages, a folded cascode input stage and a Monticelli class AB Common source output stage.

Major learning outcomes: Design and simulation of an Operational Amplifier based on a given set of characterizing parameters.

Small signal analyses, Class AB Output Stages, Frequency compensation techniques, Debugging an Analog Circuit.

Use of Cadence Virtuoso and ADE Explorer/Assembler and calculator for simulations.

Analog simulations such as .op, .tran, .ac, .stb and their working principles.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Working environment is very inclusive and the intern is treated as a member of the team. The mentor is aware that the intern may not be technically sound especially when it comes to using premium EDA tools such as cadence virtuoso, and they often spend time and help in clarifying the doubts and problems that one faces.

Academic courses relevant to the project: Analog and Digital VLSI design, Microelectronic Circuits, Analog Electronics, electronic devices, Modelling of field effect nanodevices.

Name: GANDHI AKSHAR NILESH (2018A3PS0311P)

Student write-up

PS-II project title: Architecture and design of a 'fast-trip' comparator on an eFuse

Short summary of work done during PS-II: The feature I was tasked to implement was 'fast-trip', specifically fixed fast-trip. 'Fast-trip' is an eFuse feature where the eFuse swiftly turns off to protect the connected circuitry of the customer in cases of severe faults such as a short-circuit forcing hundreds of amperes of current. I thus built a comparator that would sense the current through the eFuse chip and determine whether it was safe or not. If the current exceeded a threshold (programmable across variants for better market reach), the comparator would trip and the eFuse would be turned off.

Tool used (Development tools - H/w, S/w): H/W - Cadence Virtuoso design suite: schematic editor, layout editor and Spectre simulators.

Objectives of the project: The objective of my project was to implement a feature called 'fast-trip' on an eFuse, a microelectronic protection device for consumer electronics like laptops and iPads. The feature was to be implemented to meet customer requirements, as well as provide support.

Major learning outcomes: Throughout the internship, I was exposed to the entire chip development cycle through the guidance of numerous experienced analog design and other cross-functional engineers. As a company of TI's stature accomplishes end-to-end development of their product, I was able to gain insight into the entire process, with an emphasis on designing the chip in a simulated environment. I learnt the techniques used by seasoned veterans of the industry and managed to use a few to complete my own task.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment of the company was very comfortable. All the team members were cordial and always ready to engage in conversation. My mentor and I had weekly meetings where he managed to inspire me about the work we were doing. The expectations from my mentor were reasonable and well-managed. It was a truly enriching experience to intern at TI.

Academic courses relevant to the project: Microelectronic Circuits, Analog & Digital VLSI design.

Name: BHURE AROONDHATI SANJAY (2018A3PS0528H)

Student write-up

PS-II project title: Design of S-band Power Amplifiers with Power Combiner

Short summary of work done during PS-II: The project was to design RF Power Amplifiers that deliver high power to the load. For their design, proper bias currents, base voltages, device sizes, supply voltage, buffers, current mirrors and matching networks had to be decided. Finally, the power, bandwidth, linearity, voltage reflections and efficiency were to be met. To deliver more power, PAs are often used with Wilkinson power combiners. The project includes the design of efficient class AB S- band cascode and stacked power amplifiers with a Wilkinson combiner to deliver sufficient power. The project also involves the Volterra series expansion of nonlinear devices and the effects of non-linearity in the circuit.

Tool used (Development tools - H/w, S/w): Cadence Virtuoso, Keysight ADS, Ansys SiWave, Octave.

Objectives of the project: To design a power amplifier that met target specifications.

Major learning outcomes: Design of PAs, power combiners, matching networks, buffer, current mirror, and study of Volterra series.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Mentors are very helpful and explain using first-principles. I was asked to read papers, books and understand the concepts while simulating in EDA tools. Meetings happened almost every day.

Academic courses relevant to the project: Microelectronic Circuits, Analog Electronics, Power Electronics.

Name: AYUSH KATIYAR (2018A8PS0545G)

Student write-up

PS-II project title: RS-485 High Data Rate IC Design

Short summary of work done during PS-II: I worked on designing transmitter side of transceiver, my objectives were to meet the desired data rate and all RS-485 specifications.

Tool used (Development tools - H/w, S/w): Cadence Virtuoso.

Objectives of the project: Design transmitter side of IC and achieve target data rate.

Major learning outcomes: Circuit design, Concepts about Mosfets.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: My mentors and managers were very helpful. They not only helped me with the project but also spent time with me to learn relevant topics. Project was very challenging but equally rewarding in terms of learning outcome.

Academic courses relevant to the project: Electronic Devices, Microelectronics, ADVD.

Name: MANISH TRIGUN (2020H1230255P)

Student write-up

PS-II project title: Architecture to achieve Digital Isolator with Power scalability

Short summary of work done during PS-II: My work involves understanding the pre existing architecture completely, So that we can easily tune it according to the requirements. I also learned about oscillators and how to design one and also how to model a known Transformer, treating it as a black box and then finding out its various parameters and then use that model to alter different parameters according to the requirements to have an idea of Transformer which we require for our architecture.

Tool used (Development tools - H/w, S/w): Cadence Virtuoso.

Objectives of the project: To design and tune the Architecture according to the specifications provided.

Major learning outcomes: Learnt about digital isolator and different types of Tx and Rx architectures.

Details of papers / patents: None

Brief description of working environment, expectations from the company: My internship was fully work from home. There is no pressure regarding the tasks, enough time was given to complete all the tasks assigned and My mentor was also very supportive, He taught me many things regarding the subjects which will boost my confidence in the subject.

Academic courses relevant to the project: Advance analog and Mixed signal Design.

Name: SUKRUTH S (2020H1400236H)

Student write-up

PS-II project title: 1.Spincompare- A comprehensive Deep Learning enabled core to spin Analog equivalence check approach;2.AI powered System verilog real number Based circuit Model

Short summary of work done during PS-II: I was part of the Machine learning for Analog design and verification team. My role was to develop a neural network tool for comparing several test cases and automating them, in turn producing reports for easy checking of functionality in multiple chips and different versions of the same chip (spin compare). This approach was deployed in 4 project and helped reduce the chip cycle time by at least 1 month approximately. The second project i was involved in was to develop a AI model for circuits from a already present test bench and replicate it in SV. This cut down on the simulation times for different test benches and these models could be used by anyone in the team. It acts as a black box of sorts. This work was submitted for a International conference inside TI.

Tool used (Development tools - H/w, S/w): Cadence Virtuoso, Viva, Ltspice, Anaconda 3, Pytorch.

Objectives of the project: To develop tools using machine learning to address analog bug detection and help in design and verification of highly complex circuits.

Major learning outcomes: Machine learning, Bash, Verilog AMS, Analog design and verification.

Details of papers / patents: Submitted one paper to an international conference inside texas instruments.

Brief description of working environment, expectations from the company: TI is a fantastic place to work. You will meet the best of mind for EC and the person who you are under may hold several patents. There is no strict dress code and no strict timings. The results matter. PPO mostly depends on how much work and how a person approaches a given problem. Proper documentation and self discipline in meeting own deadlines matter most. You need to be open to learn and almost everyone will teach you something new everyday. All the projects given to interns will be used some where or the other and they give ample opportunity to try new things. There are a lot of side activates such as fun Fridays, hackathons (which i participated) and every one is

extremely friendly. You also go on team lunches almost every 2 months especially when a release of a chip is successfully completed. It is a place which will transform you as a person!

Academic courses relevant to the project: Analog design, Verilog AMS, Machine learning, UNIX, Micorelectronics.



PS-II Station: Texas Instruments (I) Pvt. Ltd., -Digital, Bengaluru

Faculty

Name: Satya Sudhakar Yedlapalli

Student

Name: AADHAR SHARMA (2018AAPS0384G)

Student write-up

PS-II project title: AMS Verification and Analog Behavioural Modelling Techniques

Short summary of work done during PS-II: The project focused on AMS verification and behavioural modelling techniques in order to automate the process involved in SoC design verification. The task was to work with a variety of mixed-signal modules for the generation of their behavioural model generation using XMODEL and perform SoC level simulations.

Tool used (Development tools - H/w, S/w): System Verilog, Verilog-AMS, Cadence Virtuoso, Simvision, Spectre.

Objectives of the project: Automated generation of high fidelity analog behavioural models and their successful integration with the SoC with the aim of reducing time from the manual model generation and reduce the time to market for TI's products.

Major learning outcomes: Exposure to System Verilog and Verilog -AMS, better understanding of analog behavioural model generation and SoC level power aware RTL simulation framework, preparing module testbenches, System Verilog model simulations.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment of the company is very good with the flexible working hours, interns are expected to work at par with the full time employees and results which can be achieved are expected. The people are really helpful in the team and for any issue the manager and the project lead assigned are very approachable.

Academic courses relevant to the project: Analog Electronics, Analog and Digital VLSI Design, Computer Architecture, Digital Design.

Name: KIRTI RANJAN PALAI (2020H1230161G)

Student write-up

PS-II project title: Automated generation of clock control module to optimize Radar Soc. Flow

Short summary of work done during PS-II: Write perl scripts to generate RTL code of clock control module. All the clock related information stored in the excel sheet date is taken by parsing the Excel file.

Tool used (Development tools - H/w, S/w): Cadence, linux, Clearcase.

Objectives of the project: To optimize soc flow.

Major learning outcomes: RTL design, scripting, automation.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is very good, manager, mentor, team mates are very helping in nature. They are helping and guiding throughout the internship period for any doubt.

Academic courses relevant to the project: Yes.

Name: CHIRAG SHARMA (2020H1230177G)

Student write-up

PS-II project title: Developing a methodology for faster closure of CDC violations

Short summary of work done during PS-II: The tasks assigned to me were in the CDC domain. I had to dump the violation data specific to some filters so that the violations closure in faster. I also did the CDC analysis of a SOC. Also I had to automate the verilog file generation of a module.

Tool used (Development tools - H/w, S/w): Jasper gold CDC analysis tool.

Objectives of the project: To develop a methodology for faster closure of CDC violations by writing scripts for violation data dumped by the tool.

Major learning outcomes: Tcl Script writing, CDC analysis in the tool, Perl script writing.

Details of papers / patents: No paper

Brief description of working environment, expectations from the company: My internship was completely in online mode. The work assigned to me was in the CDC domain. The tasks assigned to me was majorly automation specific .The tasks were explained to me clearly and the team was very helpful.

Academic courses relevant to the project: VLSI design, digital electronics.

Name: SHIVIKA GUPTA (2020H1230256P)

Student write-up

PS-II project title: More comprehensive RTL sign off using JasperGold

Short summary of work done during PS-II: For the starting 3 months, I mainly worked on doing linting checks and developing custom rules for lint. For remaining 2 months, I got few IPs assigned to me, so I ramped up on them (end-to-end RTL flow).

Tool used (Development tools - H/w, S/w): Jaspergold Superlint 2.0.

Objectives of the project: To define custom rules and edit rule file using python script, explore autoformal feature and apply it to existing live project.

Major learning outcomes: Familiarity with the complete RTL flow used in TI.

Details of papers / patents: None

Brief description of working environment, expectations from the company: I had a really good experience with my team. Most people are helpful, encouraging and warm. The quality of work is also good. It was a fruitful experience for me.

Academic courses relevant to the project: VLSI design, VLSI architectures, adv. VLSI design, adv. VLSI architectures.

Name: GANNINA VENKATA NAGA KARTHIK (2020H1230314H)

Student write-up

PS-II project title: Performance Improvement for FPGA Based Validation

Short summary of work done during PS-II: In PS-II I worked in pre silicon validation team in which I did get an opportunity to explore deep into SPI communication protocol and develop my programming skills a bit and learn some TCL scripting along with some tools like Synplify Pro and Vivado. I was able to explore deep into Vivado which I had known bit due to my academic courses which did induce a bit of interest towards the project.

Tool used (Development tools - H/w, S/w): Vivado, Synplify Pro -H/W, Python based Scripting frame work.

Objectives of the project: To improve speed for pre silicon validation which helps in reducing the time taken for running the tests scripts.

Major learning outcomes: Vivado IP manager, Python, Verilog, Build Flow, Synplify Pro, FFT IP, TCL.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: It has a very flexible working environment and all the people are very helpful whom we can reach out at any point of time. We have to work for 8 hr starting and ending at any point of time. They help us exploring a lot of things which gives a broader view of things which we have learnt during academics.

Academic courses relevant to the project: Reconfigurable Computing.

PS-II Station: Thornton Tomasetti, Mumbai

Faculty

Name: Mahesh K Hamirwasia

Student

Name: RISHIKA VENU (2020H1430029H)

Student write-up

PS-II project title: Review of steel and concrete structures

Short summary of work done during PS-II: I was working on 3 projects in the due course apart from offering for some small help for a about a day for 2 other projects. Firstly working on 116 Precinct, i learnt to calculate the shear capacity for both weld n bolted connections, using AISC manuals. Later i was working on the project CBA, where in i was reviewing the steel and concrete shop drawings. I was working wih the SD team and got a lot exposure to work, while reviewing different parts of the structure. Currently am working on thr Speedwells Avenue project, and i review the steel beam and column connections. Apart from this, TT NY offers training sessions, for young engineers and I learnt RAM concepr and RAM structures and submitted assignments for the same.

Tool used (Development tools - H/w, S/w): Blue Beam, RAM structures, RAM concept.

Objectives of the project: 1. To depict how the review of shop drawings is done in the industry
2. To exhibit the training the sessions I have taken while o learn a few softwares used in TT.

Major learning outcomes: I learnt how to calculate connection capacities for bolt n weld, under shear connections using AISC codes. I also learnt how to review the design calculation packages, the design connections of steel and also the reinforcement layouts for various structures in concrete. I learnt to use softwares like RAM concept and RAN structures as a part of my training sessions.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: TT has a very good environment to start with for a fresher, they try to combine everything that is thought to is at the college, to be put in practice, right from calculating simple shear calculations, to understanding the design connections provided. I have also seen how the rebar arrangements have been given as per codal requirements. My work was regularly being reviewed and i was given a constructive feedback as how to do i perform better and quick, each time i work, I was given tips n tricks for smart work as well. My suggestions were appreciated and mistakes were cleared. The working environment is very encouraging and always aids us to aim high.

Academic courses relevant to the project: Steel structures, concrete design, earthquake engineering.

PS-II Station: Thorogood, Bengaluru

Faculty

Name: Sandeep Kayastha

Student

Name: SIDDHARTH KUMAR DUBEY (2017B2A40717G)

Student write-up

PS-II project title: Supply chain executive Initiatives

Short summary of work done during PS-II: The first 2 months are training days, wherein you are taught different technologies which will be used in the projects. You also have to complete a case study and give a final review before going onto real projects. The trainings are quite exhaustive and very helpful, and during the case study presentation your reviewer makes sure you have in depth knowledge of the technologies used. After the case study, you are put on real projects. I was developing end to end business intelligence solutions for multinational corporations. Work involved creating systems on databases on SQL all the way till the front end in the form of dashboards that the clients could see. Work was client facing with regular client calls at least twice a week to give updates and discuss the progress. The work is very logic oriented and gives you a good insight into the working of multinational corporations. The team is very helpful and if you get stuck at some place everyone is willing to help you out.

Tool used (Development tools - H/w, S/w): SQL, Microsoft Azure, Amazon AWS, PowerBI, MS Excel, Databricks.

Objectives of the project: To provide complete end-to-end analytical solution (from data analysis to data visualisation) for our client.

Major learning outcomes: SQL, PowerBI, Microsoft Azure, Amazon AWS, Communication skills, Presentation skills, project requirements, data analysis.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment at Thorogood is very good. Every is very friendly and approachable. You are allotted a line manager from day 1 who helps you with the initial onboarding and any issue you might face during your time at the company. Working hours are also somewhat fixed at 8 hours per day they don't expect you to work more than that, even though sometimes the client meetings can take longer. You are never treated as an intern, you are given full responsibility of your work, and you get to talk to the client directly from the starting of the project. The company expects you to have

strong logical reasoning and analytic skills, be diligent regarding your work and be a fast learner as a lot of learning happens on the job. The work environment is very fun with lots of fun activities happening through the course of the internship.

Academic courses relevant to the project: DBMS.

Name: YASHODANANDAN NAYAK (2018A1PS0506P)

Student write-up

PS-II project title: Audit devops

Short summary of work done during PS-II: First we were given training on applications like AWS, SQL, POWER BI. Then we were assigned a case study which was based on use of these applications. The case study gave real life experience of how the thing work at the company. After the completion of case study I was assigned into a audit devops project where I was involved in making front end changes to the reports and also cater to the client requests.

Tool used (Development tools - H/w, S/w): Power BI, AWS, SQL.

Objectives of the project: Optimize the application developed for Auditing of various reports of Unilever.

Major learning outcomes: Learnt to use applications like AWS, SQL, POWER BI.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The whole internship was WFH for me. The company people were very nice and were ready to help. My colleagues were also a fantastic set of people. The working environment is fantastic.

Academic courses relevant to the project: NA

Name: G AALWAR SUNDARAM (2018A4PS0650H)

Student write-up

PS-II project title: Data analytics

Short summary of work done during PS-II: During the first month the training and case study takes place. After that you will be assigned to different company projects. The company projects use the technologies discussed in the training. There are plenty of good projects. I was part of 2 internal projects. It was a very good learning experience.

Tool used (Development tools - H/w, S/w): MSSQL, Azure Data Factory, Azure Databricks, AWS, Power BI.

Objectives of the project: Data analysis and data visualisation.

Major learning outcomes: MS SQL, Azure components, AWS components, Power BI, Soft skills

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The company culture is extremely good. All the employees are very helpful. The work timings are from 9 AM to 6 PM. The training given by the company during the first month will be very helpful when we start working on the projects. You will be treated just like any other full time employee.

Academic courses relevant to the project: NA

PS-II Station: Time Tooth, Noida

Faculty

Name: Arun Maity

Student

Name: PRATYUSH DUTTA (2020H1060137G)

Student write-up

PS-II project title: Design and Analysis of Aircraft Seat Test Rig using Finite Element Analysis

Short summary of work done during PS-II: FE Modelling and stress analysis of the test rig for its safe operation. FE analysis results to be validated using experimental setup.

Tool used (Development tools - H/w, S/w): Hypermesh, Optistruct.

Objectives of the project: To analyse the test rig to be used to test aircraft seats for its safe operation.

Major learning outcomes: Better understanding of Finite Element Analysis. Learning to use Hypermesh, Optistruct.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Very good working environment. Colleagues are very helpful. If any doubts or issues arise, they will help in any way possible. Working time and leave policy is good.

Academic courses relevant to the project: FEM, Theory of Elasticity and Plasticity.

Name: ASHWIN VASUDEVA (2020H1060211P)

Student write-up

PS-II project title: Multi Body Dynamic Analysis of 9 Cylinder Radial Engine

Short summary of work done during PS-II: Performed MBD analysis on Radial Engine. Learnt about MotionSolve software. Setting up of model and various inputs. Post processing to get required results. Conveying those results to client.

Tool used (Development tools - H/w, S/w): Altair MotionView, MotionSolve.

Objectives of the project: To perform Multibody Dynamic Analysis on Radial Engine so as to get joint forces and torques.

Major learning outcomes: Working of Engine, Multi Body Dynamic Analysis.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment was good. Everyone is supportive and helpful. Fun to work with colleagues.

Academic courses relevant to the project: TOM, SOM, Engineering Mechanics.

Name: MOTAMARRI SAI RAJENDRA (2020H1060270H)

Student write-up

PS-II project title: Development and Optimization of Pill Dispensing Device

Short summary of work done during PS-II: A smart pill dispenser was developed. The first 45 days, the work was to understand the system, architecture both in mechanical, electronics and IT point of view. Later, the work shifted to updating a few API calls, changing the flow of code and optimizing the code for space and time complexities. The next part was to debug. The debugging was done for hardware components and software as well. The issues in software were thoroughly researched and fixed, but the hardware parts involved changing the kernel images and device trees for hardware functionality.

Tool used (Development tools - H/w, S/w): Processor for the device, carrier board, Actuators, Load cells, AC-DC and DC-DC Converters, Audio Speaker, Amplifiers, Solenoid, Motors etc. For software, Python, Embedded C, Linux with modified kernel images and device trees.

Objectives of the project: The work involves optimization of the code of the dispenser, finding alternate components for the device for cost and space optimization and Debugging and fixing the issues of the existing device.

Major learning outcomes: I learnt how to work on a project which is product development. I also explored more about Embedded C and communication protocols and how data is communicated and transferred across different devices. I learnt how a test environment is hosted on cloud platforms in case of hardware not being available and the codes have to be tested. I learnt how the APP calls the device functions through API calls. I understood how a linux system is run and how to modify the kernel images and device trees.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: People of the company were very friendly, young and have enough experience to understand what the freshers are lagging on and help you in those blanks. They have deep understanding of their respective works and will guide you anytime, with anything they can help with. The working times, dress codes are not strict like other corporate companies.

Academic courses relevant to the project: Robotics, Embedded Systems, Python Programming, Electronics, Electrical and it's basics.

PS-II Station: Trane Technologies, Bengaluru

Faculty

Name: Paramesw Chidamparam

Student

Name: BEVARA SATYA SIVANI (2020H1410203H)

Student write-up

PS-II project title: Design optimization of intermediate shell of a scroll compressor

Short summary of work done during PS-II: First studied different compressors, especially Scroll compressor, then conducted DFMEA to understand the various failure modes possible for the intermediate shell, then generated other concepts and conducted PUGH to get the best possible concept, which is then analyzed to know the tip Gap occurring between the scrolls which decides the performance of the compressor. Then for the finalized concept we conducted cost estimation in aPriori to check whether the estimated cost saving is met.

Tool used (Development tools - H/w, S/w): CREO, ANSYS.

Objectives of the project: Design the optimized Intermediate Shell and evaluate the performance and cost saving comparing to the existing design of Intermediate shell using aPriori.

Major learning outcomes: Learnt DFMEA, PUGH and other the step-by-step process involved in developing a new product or optimizing the existing one in detail.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: In Trane Company I find a friendly and encouraging working environment. The main reason I find more involved in the work is that I was assigned to a live project which helped me to learn the actual work environment easily. My team has helped me a lot from understanding different things to completing it efficiently. The officials here are approachable and help me to understand even a small thing by explaining it clearly. From Trane i not only gained technical knowledge but also helped me to understand Industrial or corporate environment.

Academic courses relevant to the project: Product Design, Finite Element Analysis, Thermodynamics.

Name: M N INDRAJITH (2020H1480301H)

Student write-up

PS-II project title: Design and analysis of skin condenser integrated with radiative film for transport refrigeration

Short summary of work done during PS-II: In the design and Analysis of condenser for Transport Refrigeration Application Currently convective based fin and tube condenser are used. Our idea is all about replacing the existing one with skin condenser. Given there's more surface area on the unit's enclosure along with vehicles' speed ram air can be utilized as convective current for this type of skin condenser. Scope of radiative film also to be explored for the condenser heat rejection.

Tool used (Development tools - H/w, S/w): CREO, Trane fluid (company internal software for calculating properties of refrigerant).

Objectives of the project: To improve the radiative heat transfer from condenser and replace the convectional finned tube heat exchanger with skin condenser in transport refrigeration.

Major learning outcomes: Design of heat exchanger, CAD model making in CREO, two phase pressure drop and heat transfer calculations.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Company give both hands on and theoretical work knowledge.

Academic courses relevant to the project: Yes

PS-II Station: UBER, Hyderabad

Faculty

Name: Gaurav Nagpal

Student

Name: ANIRUDH GURURAJ TONASI (2018A4PS0335H)

Student write-up

PS-II project title: Business analyst

Short summary of work done during PS-II: I was assigned to ART (Analytics and Reporting) so I was mainly involved in dashboard and resource building. These dashboards are used for reporting, monitoring and sometimes as a resource. I was responsible for collecting the data (in a few instances), organizing the data, coming up with relevant metrics and finally presenting the numbers in a way that tells the story.

Tool used (Development tools - H/w, S/w): Presto, Google Data studio, Google sheets.

Objectives of the project: Creating dashboards for various internal use cases.

Major learning outcomes: Dashboard building, querying and presentation of data.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment was excellent, everybody was super helpful and friendly but also focused at the same time. This enabled me to learn a lot during the course of the internship.

Academic courses relevant to the project: None that I had taken.

PS-II Station: UBS - Global Risk, Mumbai

Faculty

Name: Bandi Venkata Prasad

Student

Name: DHANESH A ITCHHAPORIA (2018A4PS0771H)

Student write-up

PS-II project title: Risk reporting and data

Short summary of work done during PS-II: My team was responsible for helping the department in visualizing the data present with the company so that they can be put into the reports that the department makes. For this we needed to work closely with the stakeholders of the reports and get a good understanding of their requirements so that we can make the data readable in the form of charts and table. To help us in visualization we used software like MSTR, ARI to make those

articles. After production we had to review the produced articles multiple times with the stakeholders for their signoff.

Tool used (Development tools - H/w, S/w): MSTR (PURE / Microstrategy), ARI, MARS.

Objectives of the project: Report production and report requirement analysis.

Major learning outcomes: Data visualization

Details of papers / patents: None

Brief description of working environment, expectations from the company: The environment of the team and the department was very welcoming and understanding to the fact that I was new to the software and the industry. They helped me with the learning every step of the way and were very calm with setbacks I faced and pushed me in the right direction to overcome it. Only expectation from their side was that you could pickup the learning quickly and could apply it easily with the understanding of why you are doing that. Also you should have the curiosity and drive to learn more and help the team with the correct resource utilization.

Academic courses relevant to the project: None

PS-II Station: UBS - Group Finance, Mumbai

Faculty

Name: Bandi Venkata Prasad

Student

Name: DEV H DESAI (2017B4A21550H)

Student write-up

PS-II project title: Development of New Tool for Utilisation Data

Short summary of work done during PS-II: Used Python to Draw Key Outcomes from the Utilisation Data of all the teams under Valuations Control. In this project, we analyse the tasks carried out by each team member on a QoQ basis. Then we look into the number of hours spent on a certain task and how it is changing every quarter. Finally we analyse why the change in time given to the task could have taken place. For example, reduced time for a certain task could be due to the process being automated which is a good thing. However it could also be due to the task being deprioritised which isn't necessarily good. Apart from this, I worked on upgrading the monthly dashboard of Valuations Control, which included Key Results of the various teams. I used PowerBI for the upgradation of the dashboard.

Tool used (Development tools - H/w, S/w): Power BI, Excel, Python.

Objectives of the project: To automate the process of Drawing Key Outcomes from Utilisation Data using Python.

Major learning outcomes: Coding in Python, Optimal Way to Handle Large Amounts of Excel Data.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working Environment is pretty good, all interns are very well treated in a completely unbiased manner. The work too is not redundant, and you get involved into projects that are actually important for the company. The projects also gave us a good amount of learnings.

Academic courses relevant to the project: NA

Name: BALTHU SHARATH CHANDRA (2018A4PS0657H)

Student write-up

PS-II project title: Automation

Short summary of work done during PS-II: I only worked on automation and did not do any finance work.

Tool used (Development tools - H/w, S/w): VBA, Python.

Objectives of the project: Automation of manual process using VBA or Python.

Major learning outcomes: VBA

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Environment is good, team is good, as the PS progressed work decreased. Team is valuation control group where most people are chartered accountants and the function of the team is more of accounting than finance. As I am from technical background I was given automation. I expected mainstream finance but ended up with coding.

Academic courses relevant to the project: Not related to any academic course.

PS-II Station: UBS Business Solutions (India) Pvt. Ltd., - Group Operations, Pune

Faculty

Name: Bandi Venkata Prasad

Student

Name: YASH GUPTA (2017B4A20687P)

Student write-up

PS-II project title: Data management optimization

Short summary of work done during PS-II: Analysed and enhanced logic for internal data management tool, thus improving efficiency and reducing manhours required to complete business as usual tasks.

Tool used (Development tools - H/w, S/w): Operations and product analysis and management.

Objectives of the project: Analysis and optimizing internal data management tool.

Major learning outcomes: Operations and product analysis.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Helpful, inclusive team but you need to be forthcoming in asking for work and interacting with the team.

Academic courses relevant to the project: NA

PS-II Station: Udaan, Bengaluru

Faculty

Name: Annapoorna Gopal

Student

Name: AMAN AGARWAL (2018A1PS0036P)

Student write-up

PS-II project title: Optimal Target Setting for Collections Field force

Short summary of work done during PS-II: Initial Stage - To get hold of writing SQL queries in the first couple weeks then I moved on to learn statistical analysis and representation. Then I learned a visualization tool named Google data studio along with Excel. Work Tasks- To analyze chunks of data and use manipulation and visualization to make reports or dashboards. Main Project- My major project included analysis of the target allocation model where I used Advance SQL, Google Sheets and Google Data Studio along with Statistical analysis to come up with the final conclusion.

Tool used (Development tools - H/w, S/w): Advance SQL, Google Data Studio, Excel, Google Sheets, Power Point, Sublime Text Editor.

Objectives of the project: 1. To analyse the current working model of target allocation 2. To suggest possible improvements in the model.

Major learning outcomes: 1. Handling Raw industrial huge chunks of data. 2. Working on this data and use manipulation, extraction and visualization to make reports / dashboards. 3. To develop analytical thinking and make meaningful conclusions from the reports.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: I was allotted Udaan Capital team. Due to the remote nature, I had rather no communication with anyone but my Manager and Buddy. Both of them were very co-operative and motivating as they helped me gain technical expertise in the initial weeks and then only assigned me the work tasks.

Academic courses relevant to the project: Yes, To name a few- Probability & Statistics, Business Communication, etc.

Name: UTKARSH KUMAR (2018A4PS0031G)

Student write-up

PS-II project title: Promotions Playbook

Short summary of work done during PS-II: The project assigned after the preliminary training was to create a design playbook for optimally designing the promotions oriented to specific goals. The project had three steps: Benchmarking and historical analysis of previous promotions design guide for designing specific promotions superscaling the design guide to include all the capabilities present in the company.

Tool used (Development tools - H/w, S/w): Spark SQL, Azure SQL, Python, Mixpanel.

Objectives of the project: To create a complete optimized design guide to design objective oriented promotins.

Major learning outcomes: Infrastructure, basics of ledger, sales funnel. customer behaviour, feed back quantification.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The PS company worked at is Udaan Bengaluru. Udaan is a B2B ecommerce platform targeting the small

and medium sized businesses facilitating the goods acquisition process. The company aims to promote the business models unique to small and medium businesses by leveraging the technology and the efficient supply chain of the ecommerce market. the people in the company are very supportive and it is a good place to develop ones skills.

Academic courses relevant to the project: NA

Name: RISHABH VAIDYA (2018AAPS0328G)

Student write-up

PS-II project title: Building PnL dashboard, Analysis on buyer support cost reduction

Short summary of work done during PS-II: I was in the Electronics team, where I used to maintain PnL dashboard, work on different analysis, and build some of the queries, which was not built before. In the last month of internship, I also got the opportunity to work with the Electrical team, where I used to maintain several SQL queries and Google sheets, which the team tracks daily to further plan the business.

Tool used (Development tools - H/w, S/w): Google Data studio, SQL, Excel.

Objectives of the project: There were various projects throughout the internship, one project was to build the PnL dashboard in Google Data studio, that will assist the team to track the PnL report daily, based on various filters. Another project was to reduce the cost of ground level.

Major learning outcomes: Knowledge about how the E-Commerce sector works, several business parameters, PnL statement, credit line, some basic software skill, teamwork, communication skills etc.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: It's a healthy working environment in Udaan. Managers are really supportive, and always there to help wherever you got stuck. It's a growing startup, so you can expect flexible working hours, It's not like a 9-5 job. Sometimes, you have to work extra hours if the deadline is close. Otherwise, it's not hectic as an intern. It's a good exposure to learn about E-commerce company and try to cover as many projects as you can, it will definitely help.

Academic courses relevant to the project: POE

PS-II Station: Upgrad - Alumni Referral Marketing, Mumbai

Faculty

Name: Sidharth Mishra

Student

Name: SOUMADIP DE (2017B1A21757H)

Student write-up

PS-II project title: Program Management Intern - Alumni Connect

Short summary of work done during PS-II: Co-ordinating between an 800 employee strong sales vertical and around 300 upGrad Alumni.

Tool used (Development tools - H/w, S/w): Google sheets

Objectives of the project: To manage a program within the company - Alumni Connect that increases conversion in a certain part of the sales funnel by >300%.

Major learning outcomes: Task management, project management, google sheets, communication skills.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Helpful environment, good managers.

Academic courses relevant to the project: None

PS-II Station: Upgrad - Career Services, Mumbai

Faculty

Name: Swarna Chaudhary

Student

Name: GADICHARLA VENKATA SAI ANIRUDH SREEVATSAV (2017B5A41122H)

Student write-up

PS-II project title: Devops Content Strategy

Short summary of work done during PS-II: I worked on various tasks like: Content Skill Tagging CRS ICF Accreditation SME Reachouts Practice Project Solutions Lecture Notes Preparation PPTs Review Making Flow Docs Making Feedback for MCQs Resolving learners difficulties.

Tool used (Development tools - H/w, S/w): AWS, Git, Jenkins, Kubernetes.

Objectives of the project: Content creation and learners' problem resolution.

Major learning outcomes: DevOps tools and technologies.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Respectful, transparent and enriching.

Academic courses relevant to the project: None

Name: IKSHWAK JINESH (2018A4PS0573P)

Student write-up

PS-II project title: Career Services

Short summary of work done during PS-II: Wrote emails, made calls to reach agreements and to collect data, moderated sessions, entered and analyzed data.

Tool used (Development tools - H/w, S/w): Google Tools, Zoom, Intercom.

Objectives of the project: Learnt nuances of a organization in terms of operation.

Major learning outcomes: The initial basics of on how to maintain a company.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Extremely warm and approachable mentors who were able to easily guide me to an acceptable level of performance.

Academic courses relevant to the project: Economics

Name: SAKSHI SAINI (2018B2PS1171P)

Student write-up

PS-II project title: Associate

Short summary of work done during PS-II: Handling, modifying and maintaining mentor-learners data and payment invoices for the mentors to be given who are attributed by learner.

Tool used (Development tools - H/w, S/w): Excel.

Objectives of the project: Data Analysis.

Major learning outcomes: Advance Excel, SQL.

Details of papers / patents: Handling Mentor-Learners Data of upGrad.

Brief description of working environment, expectations from the company: Company is really good to work and career is safe and bright. Environment is good and work culture is superb.

Academic courses relevant to the project: No

PS-II Station: Upgrad - Content Strategy (Data), Mumbai

Faculty

Name: Swarna Chaudhary

Student

Name: NAMRATA VERMA (2017B4A40232G)

Student write-up

PS-II project title: Content Strategy - University of Arizona-Master's in Data Science Program

Short summary of work done during PS-II: The work involved creating modules for Data Science topics such as Regression, Statistics and Advanced SQL. It can be categorized under each of the given criteria as it involves Research for industry relevant content for our products, i.e. modules. Designing and testing them and also improving upon the existing steps and content for making them more effective.

Tool used (Development tools - H/w, S/w): MySQL, Excel.

Objectives of the project: The objective of this project is to create reliable and efficient strategies and ideas to enhance the delivery of the learnings to the student enrolled at upGrad.

Major learning outcomes: Gained experience in managing strategic production of Data Science related content for the University of Arizona- Master's in Data Science program, which helped me acquire theoretical and industry-oriented knowledge in topics such as Exploratory Data Analytics, Inferential Statistics & Hypothesis Testing, Basics of Machine Learning - Regression, Decision Trees, PCA, Advanced SQL.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good working environment. Friendly and helpful atmosphere. Good exposure and opportunities as you get to interact with Industry Experts in lucrative fields. We are given time to self-study a topic to get to the level of planning strategies around teaching it. A lot to learn in terms of interacting with experts, working in and across teams, and developing soft skills. Work load depends on the team, ranges from 5-9 hours a day (Monday-Friday).

Academic courses relevant to the project: Few Courses such as Statistical inferences and applications, Linear Algebra, Probability & Statistics, C programming were relevant.

PS-II Station: Upgrad - Content Strategy (Management), Mumbai

Faculty

Name: Sidharth Mishra

Student

Name: ABHYUDAYA MARYA (2020H1490839P)

Student write-up

PS-II project title: Business Development and Project Management-Purdue Programs

Short summary of work done during PS-II: End to end content creation process for the four Purdue Programs (Cybersecurity, Cloud Backend Development, Blockchain, Full Stack Development). Since Purdue was a recent partner with Upgrad, a lot of the content needed to be redeveloped to match the international standards and curriculum. Ensures the PPS (post production script), LR (language review), QC (quality check), PPT preparation among a plethora of other tasks were completed according to timelines. In addition, on publishing the modules, their feedback, NPS and CSAT scores and other metrics were calculated and any strategies and learnings accordingly. Similar tasks were later also done for the PGC-FSD and Caltech programs. Wrike was the project management primarily used. There was also coordination with external vendors for certain processes.

Tool used (Development tools - H/w, S/w): Wrike, AppScript and Google Sheets, Knowledge Hut Platform, Brightcove Platform, Mode Platform.

Objectives of the project: Managing the entire life cycle of content creation for Purdue programs. Analysis on the metrics pertaining to PGC-FSD Program cohorts.

Major learning outcomes: a. Wrike management b. Contracts & invoicing c. Language Review and Quality Content in a process d. Dashboarding on wrike e. Live Session processes f. Learner escalations g. Managerial Accounting h. Calendar schedules i. Reconciliation process j. Project Management.

Details of papers / patents: NA. The entire PS was part of ongoing programs.

Brief description of working environment, expectations from the company: Definitely a great place to start to hone an entrepreneurial mindset. Those are the ethos on which Upgrad rose to become a unicorn in the hitherto underserved EdTech market of India and has emerged as one of the leaders in the online degree space. The working environment was definitely conducive to growth, a relatively young yet diverse workforce and new unprecedented challenges every day. Unlike the expectations that one has of a sequential organized set of processes, while those were established, managing the "chaos" was a skill that really sets one apart when it comes to Project Management and Business Development. In addition, several HR principles learnt could also be noticed in plain sight which was exciting.

Academic courses relevant to the project: a. Leading and Managing Organizations, b. Managerial Accounting, c. Marketing Research & Metrics, d. Economic and Legal Environment of Businesses, e. Critical and Design Thinking, f. Strategic Management, g. Strategic Marketing.

Name: KAMALJIT KAUR BALBIR SINGH DHAMANCHALOTRA (2020H1490854P)

Student write-up

PS-II project title: Development of educational courses and expansion across channel for enhanced learning experience

Short summary of work done during PS-II: Initially I worked on development of design thinking course and redevelopment of product management course. Earlier upGrad's mode of communication with their learners was through Telegram groups, where only upGrad team can send course-related updates, but learners didn't have a platform to connect with their peers. So, I was appointed as a Community Manager where I introduced the SLACK platform to my team and after 2 months of backhand preparations, we launched a community channel on slack for our learners. Which had multiple channels and each channel had its own purpose for communication and discussion. After the success of this community created by me from scratch for the Product Management course, other courses from upGrad like the Digital Marketing course and Performance Marketing are also implementing this community as a mode of communication with learners.

Tool used (Development tools - H/w, S/w): Wrike, Slack.

Objectives of the project: 1. Creation of new course- Design Thinking 2. Redevelopment of Product Management Course 3. Kickstart of a healthy learning community on a new platform (SLACK) for upGrad learner's.

Major learning outcomes: Getting acquainted with product management domain by having a hands on experience on designing a solution for upGrad's mode of communication with learner's, which involves

1. Empathizing with learner's and understanding the pain-points
2. Brainstorming and pitching the optimal solution to the higher solution
3. Drafting important documents like SOP's, FAQ's and Internal team docs
4. Crating and handling a community on SLACK by being a community manager

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment at upGrad is encouraging. The team and manager are really helpful.

Academic courses relevant to the project: Yes.

PS-II Station: Upgrad - Content Strategy (Tech), Mumbai

Faculty

Name: Swarna Chaudhary

Student

Name: ADITHYA (2017B4A41017G)

Student write-up

PS-II project title: Content Development in Degree Programs

Short summary of work done during PS-II: I was given the opportunity to work in the field which I was interested in, that is, the Cybersecurity field. Hence, I got to learn a lot of things like Python, Linux CLI, Cybersecurity, etc. I also got the opportunity to work on a non-tech course called Environmental, Disaster and Waste Management, which was part of the BCA program offered by Chandigarh University and got to learn the process of content development at upGrad. Informally, I took up another project which was related to data scraping from upGrad itself which was highly appreciated by higher officials also. In addition to this, I was partly involved in the development of another script for automation of content upload. But the whole process could not be finished within the PS2 period.

Tool used (Development tools - H/w, S/w): Mostly internal tools from upGrad.

Objectives of the project: To develop and curate content in various tech degree programs offered by upGrad.

Major learning outcomes: Python, Linux CLI, Cybersecurity.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is really good. Everyone is supportive and friendly. You can call up anyone at almost any time of the day to discuss both formal and informal things.

Academic courses relevant to the project: 1 course was relevant: Cryptography.

PS-II Station: Urban Company, Gurugram

Faculty

Name: Pradheep Kumar K

Student

Name: PRATEEK SINGH (2017B2A80668P)

Student write-up

PS-II project title: Feature Config Manager Dashboard

Short summary of work done during PS-II: The existing feature-config-manager module encapsulates all the CRUDs and interacts with a common UI to launch and manage any Config. While the module is quite useful, the UI and UX needs a lot of improvements to convince people to make use of it.

Tool used (Development tools - H/w, S/w): Postman, vs-code, chrome dev tool.

Objectives of the project: Revamp the old dashboard. Make new features for the users to simplify the process.

Major learning outcomes: JavaScript, Typescript, NodeJs, ReactJs.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Fast pace work environment, teams are very helpful and collaborative. Company expectation is of that intern should learn fast and deliver fast.

Academic courses relevant to the project: Computer Programming, OOP.

Name: SHALEEN MAHESHWARI (2017B2A80986P)

Student write-up

PS-II project title: Notification Delivery Improvement & Tracking

Short summary of work done during PS-II: The project aimed at improving the notification delivery rates by removing all the stale devices in the database and the system. All the devices registered on UC App have a particular deviceId and a token associated with them for sending notifications. Our delivery rates tend to go down on failed notification which is the case when the device is stale or the token is expired. We basically handled removal of the devices from system such that notification is not sent to them. Use case involved both android as well as iOS devices. We took help of kafka events and removed the devices with particular error codes.

Tool used (Development tools - H/w, S/w): VS Code, GitLab, Postman, Jenkins, Kibana, Botpress, Jarvis.

Objectives of the project: The projects aimed at improving the notification delivery rates of UC app.

Major learning outcomes: Javascript, Node.js, Typescript, How to write a modular piece of code in such a way that code outlives the person.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment of the company is quite informal. People are quite approachable and supportive. There is an ease of communication and you can get in touch with high post holders such as co-founders. Everyone is willing to provide his/her full cooperation and guidance to one.

Academic courses relevant to the project: Object-oriented Programming, C programming.

Name: ROHIT K BHARADWAJ (2017B4A70633P)

Student write-up

PS-II project title: Backend Developer

Short summary of work done during PS-II: I worked on various kind of projects. My first project was on fixing one part of the internal dashboard used in UC. I had to modify the backend API, change the front-end designs and write proper UTs. I also fixed and identified various bugs and errors during my tenure. Learnt how to work in a microservice based distributed system. Learnt about various monitoring tools like Grafana, Kibana, ELK. I was also part of the instant bookings team and contributed to various tasks. Finally, my task was on functional excellence where i'm responsible for making sure metrics of microservices like UT Coverage, Errors, uptime etc is not degraded. Wrote various scripts, and built new capabilities to achieve this target.

Tool used (Development tools - H/w, S/w): NodeJS, Typescript, Javascript, Git, Kibana, ELK, Grafana, Jest, Python.

Objectives of the project: 1. Improved the internal dashboard of the company used by various stakeholders. 2. Fixed various bugs and errors which was overlooked from months. 3. Worked on various backend tasks in the instant booking team. 4. Working on functional excellence.

Major learning outcomes: 1. NodeJS 2. Backend Development 3. Microservices 4. Distributed Systems.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Very cool and chill working environment. No such sense of hierarchy as its a startup. Can easily approach anyone from VP, SVP, CTO, etc. The organization has mostly young people, and they all are very friendly and knowledgeable. People are ready to help with any doubts or queries.

Academic courses relevant to the project: OOP, DSA, Computer Programming, DBMS, Computer Networks.

Name: DEEPAK JAIN (2017B5A30935P)

Student write-up

PS-II project title: IOT for digital appliances

Short summary of work done during PS-II: My main part was to setup a entire new microservice backend for managing the smart appliance and integrating the IOT SDK to both android and ios app on the customer side. In addition to this, need to work on creating dashboard for configuring purchase guides.

Tool used (Development tools - H/w, S/w): Android Studio, Xcode, React, Kafka, MERN Framework.

Objectives of the project: Integration of IOT SDK to Customer app.

Major learning outcomes: MERN stack, NoSQL databases, Microservices Async communication through Kafka, Android, iOS, IOT.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is good. You will get a project for which you will be complete owner and other will be available for your guidance. Flexible work hours.

Academic courses relevant to the project: Data Structures and Algorithm, Operating System, Object Oriented Programming.

Name: ARSHIT MODI (2018A7PS0191P)

Student write-up

PS-II project title: Notifications Delivery Tracking and Improvements

Short summary of work done during PS-II: decreased the push notifications failure rate and enabled tracking for the same in the firebase console.

Tool used (Development tools - H/w, S/w): Node.js, Javascript, Kafka, Grafana, Kibana.

Objectives of the project: To decrease the push notifications failure rate and enable tracking for the same in the firebase console.

Major learning outcomes: Team work, corporate behaviour, time management.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Great working environment.

Academic courses relevant to the project: DSA

PS-II Station: UST Global- Trivandrum, Thiruvananthapuram

Faculty

Name: Sindhu S

Student

Name: RAHUL RAJPUT (2020H1060260H)

Student write-up

PS-II project title: Multiple object detection and tracking using yolov4 and deepsort

Short summary of work done during PS-II: Multiple objects were detected using yolov4 and detected object is tracked using deep sort. platform used is google colab and language used is python. this model is implemented for safety detection of workers at industrial sites.

Tool used (Development tools - H/w, S/w): Python, computer vision, machine learning.

Objectives of the project: Object detection using yolov4, tracking using deepsort.

Major learning outcomes: Successfully implemented the model for safety helmet detection of workers at industrial site using drone.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: I had to showcase achieved objective every week.

Academic courses relevant to the project: No relevant academic course.

Name: SUYASH MISHRA (2020H1410210H)

Student write-up

PS-II project title: Automated Guided Vehicle Suspension Design and Simulation

Short summary of work done during PS-II: The project was initiated as Modelling, designing and simulating a suspension system for Automated Guided Vehicle. Learned vibrations for multibody dynamics and exploring different software for simulation of the suspension system were retained, such as ANSYS Explicit Dynamics, ANSYS Rigid Dynamics, and ANSYS Motion and did impact analysis of a simple simulation of a ball falling on the ground in ANSYS Explicit Dynamics. Autodesk Inventor Professional for simulation of AGV suspension system along with simulation of a ball falling on the ground was done to test the software's capabilities to simulate complex mechanisms. Generated Python code, MATLAB code and Simulink models to simulate a quarter car suspension model.

Tool used (Development tools - H/w, S/w): ANSYS Explicit Dynamics, ANSYS Rigid Body, ANSYS Motion, Autodesk Inventor Professional, Python, MATLAB, Simulink.

Objectives of the project: To model, design and simulate appropriate.

Major learning outcomes: Types of suspension system- Trailing arm suspension system, Push rod suspension system, Pull rod suspension system, Independent suspension system etc. Vibrations for multibody dynamics, Exploring of different software for multibody dynamics simulation such as ANSYS Rigid Body Dynamics, ANSYS Explicit Dynamics, ANSYS Motion. Impact analysis of a ball falling on the ground using ANSYS Explicit Dynamics.

Autodesk Inventor for assembly and simulation of the AGV suspension system and simple simulation of a ball falling on the ground to test the capabilities of the module in consideration. Traces for velocity, acceleration and pressure in simple simulation of a ball falling on the ground and data obtained in excel sheet.

Assembly and Motion constraints in Autodesk Inventor.

Attempt to simulate the quarter car model suspension and damper in Inventor.

Python coding for solving and simulation of the quarter car model by solving for the equations of motions involved (second order differential equations for displacement of chassis and wheel while going over a bump).

MATLAB coding and Simulink for solving and simulating the quarter car model.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment of the company was phenomenal. The technical mentor, as well as the faculty coordinator, were beneficial in the completion of the project. The technical mentor of the company used to take regular status updates on the project by interviewing every three working days. I enrolled on a live project, adding an advantage to my work experience. The company's technical lead was very supportive and understanding of the progress and drawbacks during the project. Overall, the company had an excellent working environment with all the employees ready to help the interns at any given time during the working hours.

Academic courses relevant to the project: Yes

Name: BHARATH LAL L (2020H1490825P)

Student write-up

PS-II project title: Competitor Analysis and Market Insight Gathering (AI solutions)

Short summary of work done during PS-II: Identification of competitors and their technologies, keeping abreast of market trends and shifts in AI solutions, setting roadmap for products and product specific data gathering and insight generation.

Tool used (Development tools - H/w, S/w): Nil

Objectives of the project: Roadmap setting, Market trend updation, Gauge competition, Identify ranking in the industry, Identify new features for improvement etc.

Major learning outcomes: Data mining, Insights gathering, Presentation, Report writing etc.

Details of papers / patents: Several reports from Everest, Gartner, Forrester, Klaus were studied for research purposes.

Brief description of working environment, expectations from the company: The working environment was very amiable. The team was friendly and there was also good work life balance.

Academic courses relevant to the project: Nil

PS-II Station: Viacom18 Media Pvt. Ltd., - Digital Ventures, Mumbai

Faculty

Name: Srinath Naidu

Student

Name: VARANASI KARTHIKEYA SHARMA (2018A8PS0775G)

Student write-up

PS-II project title: Business Development and Subscription Strategy at Voot

Short summary of work done during PS-II: My stint at Viacom18 as an intern was primarily around helping the content strategy and the business development team with data analysis. I've primarily analysed sports performance on Voot. Apart from that I did competitor analysis regularly (weekly, monthly and daily). Apart from that I used a tool called Clevertap to run marketing campaigns to grow the sports category at Voot. Other than that I helped the team with tonnes of ad-hoc analysis relating to content and business. It was primarily heavy data work. But since the data is related to a product and it is related to content, it was interesting to see how data observations lead to content / business decisions.

Tool used (Development tools - H/w, S/w): Mix Panel. Clevertap, MS Excel, App Annie.

Objectives of the project: Using data to aid business decisions at Voot.

Major learning outcomes: Data Analysis, Business Development, Communication Skills.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment was good. My team always listened to my ideas. The manager I worked with was considerate and compassionate when necessary. He also pushed me to learn and do more than I was initially doing - so that helped me grow.

Academic courses relevant to the project: None

PS-II Station: VMware Software India Pvt. Ltd., Bengaluru

Faculty

Name: Chandra Shekar R K

Student

Name: SHUBH MISHRA (2017B2A71647H)

Student write-up

PS-II project title: GSLB-Geolocation DB Enhancements

Short summary of work done during PS-II: The aim of the project has been deep diving into various aspects of Avi Vantage and fundamentally question the design, architecture and code of the product with special importance to GSLB (Global Server Load Balancer) component of the product. GeoDB is the geolocation based IPv4 or IPv6 addressing table in either Maxmind, Avi or other formats, which resides in Avi Vantage and helps the DNS resolver pick up the most optimal site based on Manhattan Distance via a longest prefix match lookup of IP records of the GeoDB pushed in a Patricia trie with pre-defined priorities. The goal underlined for me is to incorporate multi-tenancy, enhance the architectural design and do other optimizations to the entire process, so that the load balancer itself is of low latency, and doesn't otherwise defeat the entire purpose of providing optimal service to the client. I achieved that using file objects to represent the GeoDB.

Tool used (Development tools - H/w, S/w): Python and Golang mostly, a little bit of C, C++ and Java. Use VSCode remote and iTerm (vim) for virtual machines based development.

Objectives of the project: To re-architect the entire Geolocation based GSLB.

Major learning outcomes: Design Principles, Load Balancers, Virtualisation, Golang, Python, Protocol Buffers, Data Structures like Patricia Tries, Django.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Excellent working environment. Flexibility is given just like BITS. If you are looking for PPO, VMware is the place to be. Work is good if you get (or ask for) a project like me. If you don't have a vacancy in your team, you are given the chance to interview with other teams, till you get a PPO. The domain

is a bit restrictive though - virtualisation. But the work environment is so comfortable here, that many people stay for quite long here.

Academic courses relevant to the project: In order of importance – CN > OS > OOPS > DSA > DBMS. Tip:- Learn about system design.

Name: ROHAN DANIEL (2018A7PS0584H)

Student write-up

PS-II project title: TCA Go SDK

Short summary of work done during PS-II: I built a golang sdk for a company platform. Most of the client code was generated using modified versions of templates from openapi generator.

Tool used (Development tools - H/w, S/w): ggolang, openapi generator, mustache templates.

Objectives of the project: Build a golag sdk for VMWare TCA.

Major learning outcomes: Go

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good working environment, with decent working hours. My project did not demand a lot of time, and got positive feedback on my work.

Academic courses relevant to the project: NA

Name: KEDAR PRIYANKA PURUSHOTTAM (2020H1030154H)

Student write-up

PS-II project title: Tasks_ETA_predictor

Short summary of work done during PS-II: For this work Machine learning predictive analysis was carried, Data was collected from web server and parse in csv format, thereby applying filtering, Preprocessing and training ML models. Also POC has been carried out in Opentelemetry to generate the telemetry data from our product TCA.

Tool used (Development tools - H/w, S/w): Python packages, opentelemetry.

Objectives of the project: When users executes a day 1/n operation on Vmware Cloud Foundation like add VI, delete VI, add cluster, delete cluster, add host and remove host Tasks and Subtasks are going on Backend which takes comparatively more time to complete this all its correspondence.

Major learning outcomes: Machine learning, Python Programming, Virtualization.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: This project helps in giving user the better experience in terms of response time and waiting time.Future research can be done by including additional essential runt time features like more hardware level properties, network properties, and storage attributes that are not only static but also dynamic could boost algorithm performance, whenever a subtask begins or progresses.

Academic courses relevant to the project: Machine Learning, Data Mining, Cloud computing.

Name: AYUSH JAIN (2020H1120290P)

Student write-up

PS-II project title: VCO Modernization

Short summary of work done during PS-II: The first one and half month was given to me for brush up and learning various Full stack technologies through an Intern Project. Requirement specification was given to me for the intern project and i was told to work independently on it. Technologies used in this were Angular, JavaScript, TypeScript, NodeJs, various libraries like Amcharts, NPM packages, SQLite3, Express Framework, input validation etc. I built the project with complete Frontend, REST API Backend server and database. Frontend was very challenging since Amchart library was to be used with Angular acc. to requirement specification. On completion of Intern Project, i presented the project to senior manager and all team members in Demo Day. then after i was moved to the Team project where i performed various task's in Docker containers to make Applications Production ready. then after i documented few features of VMware product Velocloud Orchestrator by understanding code base which was completely written in JavaScript. i used VS code Debugging to understand the code. After documentation i worked on NGINX and JavaScript files associated with it. i also worked on Kafka , Redis publish subscribe methods as NodeJS clients and implemented a common Adapter class for both Kafka and Redis. Also implemented and learnt Kafka and Redis with Docker containers. In the final phase of internship i wrote Jest Test cases of JavaScript files, fixed lint errors and did code debugging.

Tool used (Development tools - H/w, S/w): JavaScript, TypeScript, Angular Framework, HTML, CSS, NodeJS, Amcharts, Highcharts, Express Framework, SQLite3, Docker, Kafka ,Redis, Adapter Class Patterns, Object Oriented Programming and concepts, JEST Framework and testing.

Objectives of the project: Modernizing, Enhancing and feature addition in VMware product Velocloud orchestrator.

Major learning outcomes: Full-Stack software development in Angular, JavaScript, TypeScript, NodeJS. Object Oriented programming and concepts , Kafka, Redis and Docker, various libraries like Amcharts, Highcharts, Jest Testing, documentation and requirement specification.

Details of papers / patents: Not applicable

Brief description of working environment, expectations from the company: VMware is a great company with highly flexible working environment. The resources were provided in abundance. Mentors were assigned and they were very helpful. Other team members were also very helpful. they explained and helped in the tasks very well. The HR team took good care of interns. They motivated , appreciated and were always available for any help. VMware is a great company to learn and grow.

Academic courses relevant to the project: Object Oriented Analysis and Design, Cloud Computing, Research practice and SAT, Software testing methodologies, software engineering and management.

Name: HARSHINI N B (2020H1120297P)

Student write-up

PS-II project title: vDiff-Analysis of vCenter configured state pre and post upgradation

Short summary of work done during PS-II: I have created vDiff .The vDiff application takes the input command as vDiff mode commands. The vDiff mode commands are executed in four ways- Online-Online, Online-Offline, Snapshot, Offline-Offline. Once the command is entered, mode in the mentioned command is checked. If mode is one of these: Online- Online, Online-Offline, Snapshot then we read the metadata file, connect to the vCenter then we fetch the files inside the vCenter. If the mode is Offline-Offline, then we compare the files already fetched from the vCenter by taking two snapshots of different vCenters. Once comparison is completed, the output is delivered in both JSON and HTML files. Research: I learnt about the vCenter upgradation process- minor and major upgradation, virtualization, types of virtualization, vCenter lifecycle to understand the basics of vCenter. Initially Golang was very new to me because I have not studied it earlier. On exploring, I came to know how to implement channels, HTML in go, convert various file formats, parsing many non-standard file formats, connecting to server and fetching the files, making files into json, converting the files and comparing the files. I came to know and utilize

many packages of Golang. New Product Development: vDiff is a new product because there is no other option to compare vCenters other than manual process, I decided most important attributes of the vCenter for comparison to be more benefited for customers and developers. Design: Design of vDiff is based on commands. It simply has two commands- extract command for downloading files from the vCenter and compare command for comparing the files from the vCenter. Testing: The testing process has been made by installing various versions of vCenter, followed by upgradation and comparison with standard reference vCenter. Improvement in the productivity and efficiency of the product & services: Code optimization, avoiding code redundancy, having only comparison part. It is very efficient, bugs resolved.

Tool used (Development tools - H/w, S/w): Visual Studio code for Golang, Go Programming, Go Playground, Go packages, Linux, JXplorer, vCenter, Nimbus commands.

Objectives of the project: Virtual machine is a software computer which has its own memory units, CPU, network peripheral built on a physical system. vSphere is a product suite that contains ten thousand VMs and thousand hosts. vCenter manages vSphere. vCenter lifecycle.

Major learning outcomes: Go Programming - basics, concurrency, channels, interface, functions, packages, go executables. HTML, CSS, Linux, JXplorer, Nimbus commands
Go packages used: bufio, bytes, encoding / JSON, flag, fmt, io / ioutil, os, path, path / filepath, regexp, strings. Time, xml2jsogon github.com/basgys/goxml2JSON, github.com/ghodss/yaml, github.com/nsf/JSONdiff, github.com/pkg/sftp, github.com/tidwall/gJSON, github.com/wlevine/ini, golang.org/x/crypto/ssh.

Details of papers / patents: Only idea from staff engineer, no papers / patents.

Brief description of working environment, expectations from the company: Working environment: Flexible hours of working, work from home, caring and helpable team mates.
Expectations from company: To learn the domain independently, to implement the things practically and note the results, to have a bug free code, to help colleagues, to attend team meetings, to meet the deadlines, to present the build product to team mates.

Academic courses relevant to the project: Python Programming, Network Programming, Operating Systems, Algorithms and Data Structures.

PS-II Station: VMware Software India Pvt. Ltd., Chennai

Faculty

Name: Srinath Naidu

Student

Name: SAUBHAGYA SHUKLA (2018A7PS0535G)

Student write-up

PS-II project title: Creating Micro-frontend for the cloud platform

Short summary of work done during PS-II: I helped in developing the features of a Micro-frontend used by the VMWare cloud platform. The development of this microservice was done using Angular. It involved creating new features and changing the existing features as per the requirements of the team. In the next project I developed distributed logging for the microservices running in the VMware Cloud platform. This involved creating a proper logs generating system, its ingestion and finally visualisation of the received logs.

Tool used (Development tools - H/w, S/w): Docker, JavaScript, TypeScript, NodeJS, Angular, Redis, Kafka, Jest.

Objectives of the project: To create a Micro-frontend for the VMWare cloud platform. To understand and implement the necessary authentication for the frontend. Creating a distributed tracing system for the microservices.

Major learning outcomes: Learnt Angular, Typescript and JavaScript. Learnt OAuth implementation in JS. Learnt various tools such as Jaeger and Zipkin used for distributed tracing and Kafka, Redis for creating a pub/sub model for the logs. Learnt openTelemetry and ELK stack.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The team was really great to work with. The environment was really encouraging and it helped me grow immensely and learn a lot of things. The work load varied throughout the internship but was fairly manageable. The team expected the work to be done with great quality and updates are expected regularly. If anyone was stuck at any place, the team tried their best to navigate through that problem quickly and efficiently together. All the senior engineers and managers were very approachable. They provided a very positive work environment. To conclude this was a really great place to work and learn.

Academic courses relevant to the project: Object Oriented Programming, Database Management Systems, Operating Systems, Computer Networks.

PS-II Station: VMware Software India Pvt. Ltd., Pune

Faculty

Name: T Venkateswara Rao

Student

Name: AMIT KUMAR YADAV (2020H1030124P)

Student write-up

PS-II project title: Study and analyses of carbon black cloud alerts

Short summary of work done during PS-II: Done research around the alert data coming to cloud, understand the nature of data and cluster them and find out particular cluster is malicious

or not using unsupervised learning, then come up with model file which will help in classification during actual runtime.

Tool used (Development tools - H/w, S/w): IntelliJ, Python, Shell script, Gitlab, Aws Athena.

Objectives of the project: Reduce the time and manual work of Analyst by automate the process of finding if alert is malicious or not using machine learning techniques.

Major learning outcomes: Enhance knowledge about Network security domain, various machine learning algorithm like HAC-T, DBSCAN, advanced Python.

Details of papers / patents: No research paper was published at time of internship but plans are there in future.

Brief description of working environment, expectations from the company: Working environment was good, team was supporting, basic understanding of computer science domain was required like Data structure and algorithm, cyber security, DBMS, problem solving skills.

Academic courses relevant to the project: Data structure and algorithm, cyber security, DBMS.

PS-II Station: Walmart Global Technology Services, Bengaluru

Faculty

Name: Vimal S P

Student

Name: RAHUL PODDAR (2017B3A70746P)

Student write-up

PS-II project title: Msirius Project

Short summary of work done during PS-II: In the beginning I was assigned a task to make a sample fully working shopping site. This includes a repository, Backend, Frontend, and API calls to the repository. Next we had to include a BFF (Backend for Frontend) layer into this website. Next we were assigned into different teams. My team worked on the availability aspect of the item. I was engaged in Junit testing of the code and increasing the code coverage of the same.

Tool used (Development tools - H/w, S/w): IntelliJ, Springboot, Java, Maven.

Objectives of the project: To convert a monolith architecture shopping site into a microservice based site.

Major learning outcomes: JUnit Testing. Payload Generation.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: We worked mostly from home. We were called to the office 1 month before the end, that too not daily. The meetings took place at zoom. We were provided with Macbook pros.

Moving towards the expectations - we think that walmart is a big corporation so work must be good. But that was not the case for me. First 3 months went in total time pass. Next I was assigned to a team. In that team was just engaged in Junit testing.

Take aways - If you are interested in work - maybe you will get it. Depends on the team.

Academic courses relevant to the project: Object oriented Programming, DSA.

Name: NIKHIL SHISHODIA (2018A7PS0038G)

Student write-up

PS-II project title: M-Sirius

Short summary of work done during PS-II: My team was responsible for a specific service on the ecommerce website of walmart in south africa. We were in the process of switching that service from a monolithic to a microsevices based architecture. I got to assist the team in doing so. In this I learnt about how that specific service works. I got to understand its logic and also tinker with it. I also took part in writing a significant amount of unit test cases for that part to ensure that it worked as intended. We also performed performance testing to ensure that it worked correctly before it was deployed for the general public.

Tool used (Development tools - H/w, S/w): Java, Python, Springboot, React.

Objectives of the project: Provide assistance to the team in going from monolithic to microservices architecture.

Major learning outcomes: Learnt about how specific parts of an ecommerce website works.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment was really great and I had a lot of fun. I got to learn about new things and my team actively encouraged and supported me throughout the process. Help was easy to find very thorough. It is a very fun environment.

Academic courses relevant to the project: DSA, OOP, DBMS.

PS-II Station: Western Digital (SANDISK), Bengaluru**Faculty**

Name: Preethi N. G

Student

Name: GAHINA KARAK (2020H1030074G)

Student write-up

PS-II project title: Development task in SwiftProAuto product

Short summary of work done during PS-II: I was assigned tasks in each sprint (9 working days) which had to be completed. Initially to get used to the environment all necessary training was given. The first task assigned was trivial regarding static code analysis. In later sprints I was assigned to develop a power class module from scratch into the firmware code and integrate it with the code base. It required complete understanding of the module, coding the functionality, testing the functionality and successful deployment. After completion of this task, the next was to add another functionality into the code after successful changes, testing.

Tool used (Development tools - H/w, S/w): Prog language - C and python, other softwares- bit bucket, git, VHS studio, vs code.

Objectives of the project: Contribute to the project on which the team is currently working. Develop and deploy a module as per requirement and integrate it to the project.

Major learning outcomes: Collaborative work, working on real problem, NAND flash design and functionality.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Friendly and accommodating environment. Everyone is supportive and helpful. Easy to learn environment throughout. The team expects each member to deliver successfully the tasks assigned to them

on time. Peers are very understanding and friendly. Also had a lot of extra-curricular activities throughout.

Academic courses relevant to the project: Operating systems, Computer Architecture, C programming.

Name: HIMANSHU GUPTA (2020H1030121H)

Student write-up

PS-II project title: Firmware Development

Short summary of work done during PS-II: I learned all there is to know about flash devices, including how data is saved and kept at higher temperatures, how to code in Misra c, and how to handle violations relating to Misra c. I also learned how to handle block refreshing and temperature handling in Flash devices.

Tool used (Development tools - H/w, S/w): Saba build, Jenkins flow, Parasoft, SCA tool, source insight, VHS studio for validation testing.

Objectives of the project: Handling the block refreshment and temperature handling in Flash devices.

Major learning outcomes: got a complete learning of the flash devices, how the data stored and retained at higher temperature, coded in Misra c language and handling the violations related to Misra c.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The workplace environment was pleasant and welcoming. Everyone was competitive, so setting a higher standard for oneself might be motivational.

Academic courses relevant to the project: Operating system, advance operating system.

Name: HARSHWARDHAN SINGH (2020H1030176H)

Student write-up

PS-II project title: Host Independent Performance Measurement System

Short summary of work done during PS-II: The main goal of the project was to develop an inbuilt feature in the firmware to analyse the performance of the flash storage device without using any third party tools and services. After successful implementation it will be possible to do multiple tests in a quick duration as it will reduce the amount of time taken to complete a performance test. The final solution is still in a development stage and the development process will continue. Internal tools for daily relevant use case will surely be helpful for the organization to reduce the dependency on third party services and help in delivering the products at a much faster rate.

Tool used (Development tools - H/w, S/w): C & C++ Language for Firmware Development.

Objectives of the project: The project intends to analyse the performance of the flash storage device without the use of any third party performance measurement systems. The system will reduce dependability on external software and will bring down the time taken for such measurement.

Major learning outcomes: I learnt and understand the architecture level details of the working of a flash storage device. Even a simple read from a storage device involves a large number of commands and request processing. The architecture is unique and has been built keeping in mind all the possible scenarios of not just data transmission but also from error handling to the security of the storage device. The firmware of a device has to be blazingly fast and the system optimizations have to be kept in mind in every task.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is nice, my mentor was super helpful and guided me in all situations. I found the peers to be super helpful, help is just a desk away. People in WD are relaxed and fun to work with them.

Academic courses relevant to the project: Advance Computer Architecture, Advance Computer Networks.

Name: PALKAR ROHAN JAYANT (2020H1230158G)

Student write-up

PS-II project title: Understanding and Improvement of Verification Environment for Project XXX

Short summary of work done during PS-II: a) Learnt SV and UVM. b) Analyzed the design RTL and added assertion for verification. c) Improved the functional and code coverage by adding more test scenarios. d) For the scenarios which could not be covered, prepared proper explanation sheet and sent it to designer for exclusion.

Tool used (Development tools - H/w, S/w): Cadence Xcelium Simulator, Vmanager, Simvision.

Objectives of the project: The objective of the project was to understand the SV and UVM based verification environment for a project and make improvement by adding assertion. After that, I need to improve the functional and code coverage.

Major learning outcomes: I learnt SV, UVM, assertion based verification and how to analyze and improve the coverage metrics i.e. functional and code coverage.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work environment is very good. My teammates helped me a lot when I got stuck somewhere.

Academic courses relevant to the project: VLSI Test & Testability, Digital Design.

Name: MD ARIB FAISAL (2020H1230172G)

Student write-up

PS-II project title: Effect of different cycling condition on the program disturb mechanism

Short summary of work done during PS-II: In the past few decades, NAND flash memory has been one of the most successful nonvolatile storage technologies, and it is commonly used in electronic devices because of its high scalability and reliable switching properties. Qualified the 3D - Nand Flash memories based on different reliability test parameters that were checked. The different reliability parameters that were checked: EPR cycle, Program Disturb, Read Disturb, Data Retention, Cross temperature effects. UDA was developed for all these tests. And the data is processed using Python.

Tool used (Development tools - H/w, S/w): WD in-house tester, C, python, TIBCO spotfire.

Objectives of the project: To get introduced to the Nand flash memory reliability and qualification work. To qualify the Nand memory die as per the specifications given.

Major learning outcomes: How to qualify a Nand flash memory and the recent testers used by WDC.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment is too good in WDC. My team has very knowledgeable mates. My manager is very supporting and helping. All my teammates are gave me the KT session that are very useful to

understand the work flow in our team. After that they expect me to the same work that I was explained by then. I qualified a memory die and a tester.

Academic courses relevant to the project : Semiconductor Physics, Nand Flash Memories, C, Python.

Name: BHAVYA KAUSHIK (2020H1230244P)

Student write-up

PS-II project title: Phase-Locked Loops and Temperature Sensor

Short summary of work done during PS-II: My internship started with a couple of reading assignments on PLL. This was followed by an assignment to design a simple charge-pump based PLL which involved understanding and designing each component one by one. The second half of my internship was mainly focused on Temperature sensor.

Tool used (Development tools - H/w, S/w): Cadence Virtuoso.

Objectives of the project: To design a charge pump based PLL. To design a sensor whose output frequency varies linearly with temperature.

Major learning outcomes: I got an opportunity to work on smaller technology nodes such as 16 nm. While working on PLL, I was able to develop a good understanding of its components. While working on temperature sensor, I learnt how one can optimise the design.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The working environment of the company is good. My mentor was supportive and guided me with a lot of patience while I was working on temperature sensor. He helped me understand the nitty-gritty of the design of temperature sensor.

Academic courses relevant to the project: AICD, Advanced analog and Mixed signal design and Advanced VLSI design.

Name: MISHRA ABHISHEK PARMESHWAR (2020H1230325H)

Student write-up

PS-II project title: VTRAN Evaluation

Short summary of work done during PS-II: Evaluated the VTRAN Tool, learn PERL scripting.

Tool used (Development tools - H/w, S/w): VTRAN, LINUX.

Objectives of the project: To convert different files to other format to check the actual fabricated chip.

Major learning outcomes: How to convert stil to atp, how to convert atp to verilog testbench.

-How to convert eVCD to atp, how to convert multiple atp to verilog.

-How to convert stil to pat.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Good Environment, Good Work life balance, lot opportunity to learn.

Academic courses relevant to the project: VLSI test and testability,, VLSI design, Embedded systems.

Name: SHUBHI DUBEY (2020H1230334H)

Student write-up

PS-II project title: NAND Failure Detection

Short summary of work done during PS-II: The role of a Product Engineer requires to understand and design test flows for a particular product line. After Test Programs are developed by test engineers, the code is validated by PEs again. Then it is released into production. The test results and yield are then analyzed and the failures are studied again in labs for any scope of improvement or to analyze reasons of failure which could be prevented in future.

Tool used (Development tools - H/w, S/w): S/W - Redshift, PyCharm, MS-Excel for data analysis; Languages - C, Python, SQL.

Objectives of the project: Data analysis at different test steps that a die goes through to successfully reach the market.

Major learning outcomes: Understood manufacturing test processes and the test flow design.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The company has a great work culture. Every colleague is very supportive and helpful.

Academic courses relevant to the project: VLSI Design, VLSI Test and Testability, CAD IC Design.

Name: PANCHAGNULA PREETHIKASARAN (2020H1230344H)

Student write-up

PS-II project title: Effect of different cycling condition on the program disturb mechanism

Short summary of work done during PS-II: Because of its great scalability and dependable switching capabilities, NAND flash memory has emerged as one of the most successful non volatile storage technologies in recent years. It is widely utilised in electronic gadgets. based on many reliability test parameters that were examined, the 3D-NAND Flash memory were qualified. EPR cycle, Program Disturb, Read Disturb, Data Retention, and Cross Temperature Effects were among the other reliability metrics that were examined. For all of these tests, UDA was created, and Python and TIBCO Spotfire were used to handle the data.

Tool used (Development tools - H/w, S/w): WD in-house tester, C, Python, TIBCO spotfire.

Objectives of the project: To get introduced to the NAND flash memory reliability and qualification work. To qualify the NAND memory die as per the specifications given.

Major learning outcomes: How to qualify a NAND flash memory and the recent testers used by WDC.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: My team has sound knowledge on what they are doing. My manager is very supportive and encouraging. The environment in WDC is very good. Learning curve is very high.

Academic courses relevant to the project: Semiconductor Physics, NAND Flash memories, C, Python.

Name: SHREYAS GHONGE (2020H1400111G)

Student write-up

PS-II project title: Extracting low level NAND sequences sent to the NAND for high level API calls

Short summary of work done during PS-II: Developed the framework for extracting the low level NAND flash sequences for each API call. Designed and developed the firmware on the memory controller using C programming language. Apart from this, also developed APIs to implement new customer requests. Also helped in developing the controller firmware for new NAND node technology.

Tool used (Development tools - H/w, S/w): C programming, VSCode code editor.

Objectives of the project: For each API that the firmware team creates for it's users, the memory controller sends a fixed set of sequences to the NAND flash to perform that operation. The project objective was to design a framework that will extract these low level sequences.

Major learning outcomes: Firmware development for a custom made memory controller, C programming for embedded SOC, NAND flash design manual study.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work Environment: Very positive work environment. Managers and mentors are very helpful and considerate towards new joiners.

Expectations from the company: The company expects a good learning aptitude and communication skills.

Academic courses relevant to the project: Yes, Embedded Systems related courses were very useful for the internship.

Name: BANURI SHIVANI (2020H1400124G)

Student write-up

PS-II project title: Yield Improvement analysis at package level testing for a new product release

Short summary of work done during PS-II: NAND Flash is one of the most sought out non volatile storage technology in the past few decades because of its scalability. Worked on the development of CDT(Controller Driven Test) test flow for the NAND Flash memory for a new product release where QLCs (Quad level cells) are used for the first time in the micro SD cards. Optimized the same CDT test flow for few instances and test blocks where yield was low and improved the yield for the product.

Tool used (Development tools - H/w, S/w): 1. SW tools - sublime text, vnc viewer, winscp, NANO NT and Log splitter (in house tools), 2. HW tools : In houses testers for testing the micro SD cards.

Objectives of the project: To get introduced with the NAND Flash memory working, NAND flash memory failure cases, NAND Flash memory testing in the end product via the controller and yield improvement analysis of the NAND memory products at package level testing using CDT.

Major learning outcomes: Got an understanding of NAND Flash memory working, product manufacturing test flows, failure cases of NAND and yield improvement analysis.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment of the company and the team were quite pleasant. All the team mates and the manager were very understanding, supportive and helped me during each time I faced issues.

Academic courses relevant to the project: VLSI design.

Name: VIKHE GAUTAM KAILAS (2020H1400169P)

Student write-up

PS-II project title: Validation of External SSDs

Short summary of work done during PS-II: As a part of Validation team, I was supposed to validate the design of different IPs that were a part of the storage controller designs. The design was divided into different subsystems, each containing a set of IPs, each meant for a different purpose. I was assigned a few IPs. To validate a IP, one must first understand how it works and then develop a test case plan and corresponding test cases. These test cases are then run over the design to validate the IP. IP is verified to work properly only if it passes these test cases.

Tool used (Development tools - H/w, S/w): SW -Teraterm, VS code, GCC, Metaware, Source Insight, Allegro, Trace32 debugger. HW - Lauterbach and MDB debugger, Digital Oscilloscope, Digital Multimeters.

Objectives of the project: To learn the validation, its relevant tools, methodologies and practices.

Major learning outcomes: Tools used for validation, Datasheet analysis, test cases development, hands-on experience with hardware, IP (intellectual property) study, teamwork, cooperation.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The working environment was great. All of the team mates were very helpful and encouraging. Initially, I was tasked with getting to know all the general tools that the team uses and slowly I was included in the ongoing projects. Gradually, I was assigned certain IPs (smaller ones) and asked to study them and their test cases and run the same.

Academic courses relevant to the project: Yes, the academic courses like VLSI architecture, Embedded System Design and Software for Embedded Systems, Real time operating Systems have been of immense help. The concepts that I learnt their could be applied directly into the work

Name: MUKKAVALI VENKATA DEVI KARTHIK RAJA (2020H1400173P)

Student write-up

PS-II project title: NAND interface testbench development

Short summary of work done during PS-II: The initial task was to design a framework for the device having a host interface and a NAND interface. The device is supposed to pick up some data from host and write it to NAND and vice versa i.e., transferring of data between host and NAND. The design should be a generic one supporting any kind of host interface and NAND interface. The design should be extensible and reusable with minimal changes. The design implementation to be done in C++. This is followed by creating actual Test benches for various controllers in which different pin level operations of NAND INTERFACE MODULE were verified.

Tool used (Development tools - H/w, S/w): Visual Studio, GTK Wave.

Objectives of the project: The internship project entails developing the C++/SystemC testbench to verify the pin-level operations of the NAND Interface Module for various controllers.

Major learning outcomes: Understood the functionalities of various features present in the NAND INTERFACE MODULE (IP).

Learnt different debugging techniques in VS.

Learnt how to create a testbench from scratch, GTK wave tool usage, SystemC.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Be it the online mode initially and later when had to come to on-site this company and especially the team was always welcoming. The expectations from an intern are of course not very high but what they expect is that the candidate should grasp the essentials all along the way and eventually adding a value to the team and the company in the future.

Academic courses relevant to the project: VLSI Architectures, Embedded System Design.

Name: AAKANKSHA PIYUSH GUJARATHI (2020H1400181P)

Student write-up

PS-II project title: Post Silicon Debugging

Short summary of work done during PS-II: The project focuses on locating the manufacturing defects in memory chips. A series of experiments are designed based on the description of the defects. The experiments are shared with the lab. Based on the results, root cause analysis is performed, and the possible location of the defect is shared with the lab. Python scripting, layouts and schematic of the design, analysis of netlist and RTL simulation waveforms are used for RCA.

Tool used (Development tools - H/w, S/w): Verdi, Cadence Virtuoso.

Objectives of the project: To do the RCA of post silicon bugs.

Major learning outcomes: Practical Application of stuck at fault models, set up and hold time and basic VLSI concepts.

Details of papers / patents: None

Brief description of working environment, expectations from the company: Supportive team and helps to understand the concepts. The team expects to have strong fundamental concepts.

Academic courses relevant to the project: VLSI Design, VLSI Test and Testability.

Name: JEEVARAAM K (2020H1400216H)

Student write-up

PS-II project title: Advanced Debug Infrastructure

Short summary of work done during PS-II: As a part of the Validation team, the members are constantly required to look at the specific registers in order to make sure that the ASIC is working

as per the requirement. Not only to ensure that working is as per requirement, but also to debug any issues during the validation, the members are required to look at the register contents. In order to verify the contents of a register, a person has to look at the register description or the architectural description to identify the base address of the register and then look at the register bitfields to identify the value that is stored in the corresponding register. This is a time- consuming task if it is done frequently.

Tool used (Development tools - H/w, S/w): Embedded C, FPGA Platforms, Python, Shell Scripting, Bash Scripting.

Objectives of the project: To automate the repetitive tasks that consume the human time.

Major learning outcomes: Know about the industrial practices of development tools and environment.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The work environment was free and jovial. The company expects us to complete the work in time not considering the timing for how much time we work. At the end the work should be completed before the deadline. They expect us to learn on our own rather than they teaching us everything.

Academic courses relevant to the project: VLSI Architecture, Software for Embedded Systems, Embedded Systems Design.

Name: SHRI LAKSHMI A (2020H1400217H)

Student write-up

PS-II project title: Design and implementation of a dashboard for data visualisation of performance tests run on SSDs

Short summary of work done during PS-II: The strategic dashboard that supports interactivity has been explored for features that can be employed to meet the specifications. The design has been successfully implemented and tested to the usefulness in a number of phases with each phase contributing to improvements without compromising the objective of the dashboard. Having automated the data visualization of the performance index of SSDs, the error areas of the failure can be spot without any cost in time helping the user with direct proceeding to debug without ambiguity.

Tool used (Development tools - H/w, S/w): Python, Java.

Objectives of the project: For better visibility of performance test held, on-demand access to all the most important metrics is required. To meet the requisite to transcribe multiple source data onto a single interface is another expected feature to reduce time.

Major learning outcomes: 1. Working of software framework 2. Technical need for the team 3. Time management 4. Task management

Details of papers / patents: [1] <http://arstechnica.com/information-technology/2012/06/inside-the-ssd-revolutionhow-solid-state-disks-really-work/>

[2] <http://arstechnica.com/information-technology/2012/06/inside-the-ssd-revolutionhow-solid-state-disks-really-work/>

Brief description of working environment, expectations from the company: Extensive studying and independent task management were the featured characteristics of the work environment. The team had managed to make time for the daily updates of the work in hand to meet the blocker situation during internship activity.

Expectations: Individual feedback on timely basis for interns could have been more appreciable.

Academic courses relevant to the project: Embedded System Design, Software of Embedded system, Device Drivers.

Name: POLICE MANOJ KUMAR REDDY (2020H1400246H)

Student write-up

PS-II project title: Design and Verification of Dual Port Memory with APB Interface Using SV and UVM

Short summary of work done during PS-II: The AMBA family of conventions includes APB. The 32-bit model was created to allow Master and Slave devices to communicate. The dual port memory is the slave we are looking at. The Testbench serves as the Master APB, while the dual port memory serves as the slave APB. The suggested work's main goal is to plan and investigate the protocol's various functional aspects. The proposed work's system makes use of the system verilog language and the system verilog testbench to run numerous test cases.

Tool used (Development tools - H/w, S/w): EDA Simulator.

Objectives of the project: To design the APB protocol. To verify the functionality of the design.

Major learning outcomes: Verification Concepts, System Verilog, UVM.

Details of papers / patents: NIL

Brief description of working environment, expectations from the company: Very good working environment with good supporting and motivating mentors and manager.

Academic courses relevant to the project: VLSI Design, VLSI Test and Testability.

PS-II Station: Whirlpool, Pune

Faculty

Name: Benu Madhab Gedam

Student

Name: KUSHAGRA LUTHRA (2020H1060214P)

Student write-up

PS-II project title: Carton Tear Modelling

Short summary of work done during PS-II: Simulation methodology for predicting the tear in Carton using LS-DYNA software has been developed. Through the project I got to understand the material characterization for the cardboard in which cardboard has been modeled by considering it as an orthotropic material. I have explored different modeling techniques for the cardboard that can be used in the industry and finally the cardboard was modeled using a homogenization approach which aided in the reduction of the multiple layers (liners and flutes) of the corrugated cardboard to a single layer- modeled using shell elements. This homogenized model enabled us to replace 3D corrugated cardboard geometry by a single 2D plate (homogenized). Different simulations were performed i.e 3-Point Bending test, Burst test, Puncture Test and validated it with experimental results. Also, it gave me an opportunity to learn industry oriented software such as Hypermesh (Preprocessing), LS-DYNA (Solver) and Hyperview (Post Processing).

Tool used (Development tools - H/w, S/w): Hypermesh, LS-DYNA, ANSYS.

Objectives of the project: Simulation methodology development for predicting the tear in Carton using LS-DYNA software.

Major learning outcomes: 1) Mullen or ECT Grade carton material characterization 2) Burst behavior mapping 3) To explore the various Modelling techniques used in industry.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The working environment was really good, everyone in the company is really supporting, the top management also helps in improving the methodology of a particular task. The expectation was just to complete my project on time and learn as much as possible.

Academic courses relevant to the project: FEA, CFD, QUALITY IMPROVEMENT.

PS-II Station: WILP, Hyderabad

Faculty

Name: Raghuraman S

Student

Name: GUVVALA GOPI REDDY (2018A2PS0158H)

Student write-up

PS-II project title: Ansys

Short summary of work done during PS-II: Comparing strength of steel and concrete and developing a machine in Ansys.

Tool used (Development tools - H/w, S/w): ANSYS.

Objectives of the project: Model a machine use to cultivate rice plants, seeds ext.

Major learning outcomes: How to use ansys.

Details of papers / patents: None

Brief description of working environment, expectations from the company: I am working online.

Academic courses relevant to the project: Analysis of structure.

Name: ISHFAQUE ARIF CHOUDHURY (2020H1060133G)

Student write-up

PS-II project title: Vehicle Control System

Short summary of work done during PS-II: Develop Simulink models for auto-calibration of Steer by Wire. Revamped the electronic components to create a modular system. Also, testing of engine parameters with the ECU in Hardware in Loop. We also developed relevant experiments for the above mentioned models.

Tool used (Development tools - H/w, S/w): Simulink, Raptor DEV, Raptor CAL, TunerStudio MS.

Objectives of the project: To develop Simulink models for calibration of Steer by Wire and testing ECU in Hardware in Loop to observe change in engine parameters.

Major learning outcomes: Understanding Control Systems, flashing of ECU and Automatic Driver Assisted System.

Details of papers / patents: NIL

Brief description of working environment, expectations from the company: Working environment is fulfilling as they motivate us to achieve our goals that have been set. Also, any fresh ideas are recognized and any help required to start it is also provided by them.

Academic courses relevant to the project: Control System.

Name: ROBAN KARTHICK V K (2020H1060146G)

Student write-up

PS-II project title: Vehicle Control Systems

Short summary of work done during PS-II: Develop Simulink models and implement them on the automotive experimental setups in the lab, study about their working. Maintain a complete documentation of important experimental setups, which consists of the background, procedure for simulation, circuit layout, results and discussions.

Tool used (Development tools - H/w, S/w): Simulink (MATLAB), TunerStudio.

Objectives of the project: To learn about various automotive systems and interfacing them with electronic devices.

Major learning outcomes: Learnt about Simulink for programming purpose, gained knowledge on working of various automotive devices.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: The people present in the PS station were very comfortable to work with. There are some new things to learn.

Academic courses relevant to the project: Not much, since it dealt with electronics and automotive devices most of the times.

Name: BIJIVEMULA VIJAYA SIMHA REDDY (2020H1060277H)

Student write-up

PS-II project title: Hardware in loop-Vehicle control systems

Short summary of work done during PS-II: I was assigned to the control systems laboratory. I was expected to set up some new experiments based on the Speeduino ECU. building Model in the loop of the engine on MATLAB-Simulink, and testing this with ECU was the primary objective. Later I did ECU tuning with the help of the tuner studio and analyzed variation on Simulink.

Tool used (Development tools - H/w, S/w): S/w-Simulink, Tunerstudio, Picoscope H/w- DAC, ECU, Picoscope.

Objectives of the project: Design a hardware in loop for Speeduino ECU.

Major learning outcomes: ECU Tuning, Vehicle Control systems.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Since it is the remote lab for WILP students, the objective was to upgrade existing experiments for new challenges and develop a new set of experiments. I was given the freedom to choose to design any experiments based on control systems. Management supported purchasing new hardware and software.

Academic courses relevant to the project: Control systems.

Name: DANSON D (2020H1410082G)

Student write-up

PS-II project title: Vehicle Control Systems

Short summary of work done during PS-II: Developed a Autocalibration system for Steer by Wire system.Developed an HIL system for Ecu Tuning.Made a modular architecture for brake by wire and Electronic throttle control systems.

Tool used (Development tools - H/w, S/w): Matlab, Simulink, Tuner Studio, Arduino, State flow, Speeduino ECU, Raptor ECU programming.

Objectives of the project: Help develop new experiments on the premises on emerging Automotive technologies.

Major learning outcomes: Control Systems, Simulink, Arduino Programming, ECU tuning both RAPTOR and Speeduino.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: It was a startup kind of environment where you could get your hands on emerging automotive technologies like ADAS, Drive by Wire etc.

Academic courses relevant to the project: Nil

PS-II Station: Yugabyte, Bengaluru

Faculty

Name: Jyotsana Grover

Student

Name: SYED AHSAN ABBAS (2017B3A70507P)

Student write-up

PS-II project title: Yugabyte Platform Product Enhancements

Short summary of work done during PS-II: Project 1 - Automating Grafana Dashboards: Design a process to use all metrics including database metrics, uptime, read/write latencies, throughput to be shown in graphs in an automated grafana dashboard using a config file and a corresponding CLI command to regenerate dashboard to avoid deprecation. Project 2 - Rotate SSH Keys: Platform uses asymmetric encryption key pairs to access/login to database nodes via SSH, which must be renewed at intervals of time (security mandate). This project involved adding the rotation functionality in Yugabyte Platform.

Tool used (Development tools - H/w, S/w): Techstack: Java, Python, Postgres, Bash, Ansible, Git, React, Phabricator, Maven.

Objectives of the project: Project 1: Automate Grafana Dashboard Generation, Project 2: Rotate SSH Keys.

Major learning outcomes: Learnt how to deliver an end to end infrastructure engineering project - from designing feature/requirements, implementation and making it customer ready. Collaborating with others, code reviews, understanding different cloud providers - AWS, GCP and Azure, navigating a big codebase and giving technical demos.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Transparent culture with approachable and helpful people - will directly present to the founders. Interns are given good projects and a mentor.

Hybrid - Choice of WFH or Office. No restrictions on leaves. Great perks: Uber allowance, Relocation assistance and reimbursement for initial stays etc.

Academic courses relevant to the project : Operating Systems, Object Oriented Programming, Computer Networks.

Name: RAHUL GANESH PRABHU (2018A7PS0193P)

Student write-up

PS-II project title: Assorted Projects at Yugabyte

Short summary of work done during PS-II: Improved the NTP configuration workflow during cluster node setup on YugabyteDB Anywhere. Also implemented the capability for the customer to provide their own NTP servers for cluster nodes to connect to. Besides this, I also implemented a feature that allowed customers to provide their own custom scripts that can be run on the cluster node that can be triggered by different events. At present these events are different points in long running operations like cluster creation or upgrades.

Tool used (Development tools - H/w, S/w): Multiple Java tools for ORM, API and test framework; Python; Ansible; Postgresql; Chrony; Bash; Linux; Cloud Computing.

Objectives of the project: Implementing multiple features in YugabyteDB Anywhere, including support for NTP configuration and custom scripts.

Major learning outcomes: Working in a team; Agile software development; Professional software development practices.

Details of papers / patents: None

Brief description of working environment, expectations from the company: The work environment is friendly and focused. The work was remote with an option of going to office when we so desire. We were immediately put into actual work that was necessary for the product. Interns are treated like FTEs and get complete responsibility of their projects.

Academic courses relevant to the project: OOP.

PS-II Station: Zeotap India Pvt. Ltd., Bengaluru

Faculty

Name: Raja Vadhana P

Student

Name: MUNIGALA SHIVA (2017B3A70494H)

Student write-up

PS-II project title: Data ingress and egress

Short summary of work done during PS-II: Our team is called as integrations team, where we integrate different sources and out bound channels, both real time and batch usecases. For example a company called SKY has its data in salesforce CRM, it wants to send this to Salesforce marketing cloud for advertisement purposes. We take the data from salesforce CRM, send it to our DE team which will enrich the data and puts them in GCS bucket, and finally we again pick this data from this GCS bucket and send it to channels like salesforce marketing cloud.

Tool used (Development tools - H/w, S/w): Harness, IntelliJ, Postman.

Objectives of the project: Take data from different sources such as Bigquery, Snowflake and put it to destinations like GCS bucket.

Major learning outcomes: System design, OOP applications.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: As this is a startup company, they generally give you the same amount of work as they give their full-time employees, and you are expected to perform like them as well. There are many team in the company and work environment differs from team to team. Other colleagues are really helpful in our team. There can be a few hectic days of there is a prospect of a new client using our product and we have to add additional features for them.

Academic courses relevant to the project: OOPS, DBMS.

PS-II Station: Zetwerk Manufacturing Businesses Pvt. Ltd., Coimbatore

Faculty

Name: Glynn John

Student

Name: WAMORKAR MAYURESH MADHAV (2020H1410097G)

Student write-up

PS-II project title: Reverse Engineering of products, China Sourcing

Short summary of work done during PS-II: I have tested the number of various product on the basis of performance, and compared it with the existing competition in market. Also I have sourced the various suppliers from china who are manufacturers and can supply the product in less rate and better quantity.

Tool used (Development tools - H/w, S/w): Electric Testing Panel.

Objectives of the project: 1) Sourced products from China. 2) Reverse engineering.

Major learning outcomes : Learnt about how an organisation actually works.

Learnt about steps involved in reverse engineering/backward integration.

Learnt about testing criteria for different types of products.

Learnt about china sourcing of products.

Learnt about shipping lines and about the costing of imported product.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Zetwerk is a startup, so work is very demanding and workload is high.

Academic courses relevant to the project: Product Design.

PS-II Station: ZF Wabco, Chennai

Faculty

Name: Glynn John

Student

Name: MULANI SHOAIB MUNIR (2020H1060273H)

Student write-up

PS-II project title: Sensor Upgradation for Wear Monitoring & Stroke Measurement for Clutch Servo in Manual Transmission

Short summary of work done during PS-II: Conceptualization, Idea generation, design and integration of the wear monitoring and stroke measurement. In this project to ensure the maximum optimized design considering cost reduction and technology improvement in mind a mixture of NPD with tools from DFSS were used to improve overall functionality while also using efficient design methodologies. Also understanding of how cross functioning teams and expertise in different domains helps develop an overall functioning product.

Tool used (Development tools - H/w, S/w): CREO Parametric, Python, Arduino Ide, Knime, Excel.

Objectives of the project: The objective of the project is to replace or retrofit old inductive sensors used in Clutch Servo systems with the new technology of sensors that can be further utilized with SENT and CAN protocol in a commercial vehicle.

Major learning outcomes: This project is new product development and encompasses technology, design, hardware, software & data analytics. This, diversification of technology and using the pros of each domain surely helped us to develop a very fresh concept from scratch. The main benefit of this concept is it is highly customizable, can be easily retrofitted among vast product portfolios, also we have taken all steps necessary to make it future proof and understand its limitations.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment is very supportive and you will definitely get to learn new things. The company is highly technology driven and lot of research is to be done before starting your projects here. Overall you will understand the real core of New Product Development and its Lifecycle. Great opportunity for individuals looking to work in automotive domains.

Academic courses relevant to the project: Mechatronics, Advance Engg. Mathematics, Product Design & Development, Robotics & Mechanisms, Finite Element Methods, Dynamics & Vibrations.

PS-II Station: Zinnov Management Consulting Pvt. Ltd., (IT Project), Bengaluru

Faculty

Name: Pradheep Kumar K

Student

Name: PIYUSH VIG (2020H1410163P)

Student write-up

PS-II project title: Thought Leadership

Short summary of work done during PS-II: Thought leadership is the expression of ideas that demonstrate you have expertise in a particular field, area, or topic. Many executives and business leaders strive to become a thought leader in their respective fields. Utilizing content marketing, social media, and other means to increase your authority and influence are key for successful thought leadership. Utilizing content marketing, social media, and other means to increase your authority and influence are key for successful thought leadership. Utilizing content marketing, social media, and other means to increase your authority and influence are key for successful thought leadership. Zinnov works in the Thought Leadership area for many major enterprises. The major client of the team I am assigned to is Microsoft, so we work on Point of and help them in understanding the type and opportunities for them in the market. The role of the team is to work according to the needs of the client and help them in finding new opportunities in the emerging markets by making a Point of View, which will help the client in understanding the trends in the market and which areas they can focus on to invest in the market.

Tool used (Development tools - H/w, S/w): Microsoft Excel and power point.

Objectives of the project: 1. To Prepare presentations on different markets according to client needs. 2. To show opportunities in the new market by doing research according to client needs.

Major learning outcomes: Learnt a whole new perspective for different kinds of new emerging markets.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: My mode of PS is online mode, so I had to work on the laptop provided by the company at home. Company doesn't put too much high expectations from the start of the internship, the colleagues and team lead helped us in learning the work culture and requirement step by step without any pressure. They helped in integrating into the projects seamlessly without giving too much work in starting and helps in learning required skills to perform the task.

Academic courses relevant to the project: NA

Name: RISHABH KUMAR SRIVASTVA (2020H1420189P)

Student write-up

PS-II project title: Hyper Intelligence Automation Platform Report

Short summary of work done during PS-II: The work done was completely related to Market Research and provides a actionable plan to HIA ENTERPRISES on how to improve their efficiency of the products (like RPA,IDP etc.) for better Return on Investment (ROI) and achieve better market penetration in various horizontals such as HR, IT, F&A, Sales and Marketing , Vendor MAnagement and Legal.

Tool used (Development tools - H/w, S/w): Excel, Microsoft Office.

Objectives of the project: The Objective of the report is to provide insights on: • The current HIA market spend and the expected HIA spend by enterprises in the next 5 years. • The HIA talent landscape across the world. • Actionable recommendations that enterprises can follow.

Major learning outcomes: 1. Learnt various tools such as Excel and Microsoft Office.
2. Got a good overview of new HIA Technologies such as Robotic Process Automation (RPA), Intelligent Document Processing (IDP), Low Code/No Code (LC/NC), Process Mining, Task Mining and Business Process Management (iBPMs) and their impact on various Industries.
3. Got exposure to Financial aspect of these new Automation Technologies.

Details of papers / patents: Not published

Brief description of working environment, expectations from the company: It is a good place to learn what's going on in the cutting edge in the world, whether it is doing research on new revolutionary automation field or whether doing research on sustainability and green environment goals. The work is related to doing extensive market research by tracking the progress of various relevant companies. The work environment is good and employees there are very helpful.

Academic courses relevant to the project: Management, IT Consulting.

**PS-II Station: Zinnov Management Consulting Pvt. Ltd., (Non-Tech),
Bengaluru**

Faculty

Name: Ramesh Venkatraman

Student

Name: KARTIK KOTHARI (2018A1PS0797G)

Student write-up

PS-II project title: Digital Analyst

Short summary of work done during PS-II: Major work on excel sheet to find insightful data to prepare PPT.

Tool used (Development tools - H/w, S/w): Microsoft Office.

Objectives of the project: To make presentation on objective in domain of technology.

Major learning outcomes: Writing, Analytics

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Constant work on finding points / data and always have the pressure of timeline.

Academic courses relevant to the project: Yes

Name: BALUSU KANDARPA DATTA (2018A4PS0561G)

Student write-up

PS-II project title: Consulting Research

Short summary of work done during PS-II: Daily or weekly consulting requests regarding finance, management, organization structures, talent acquisition strategies among other were given out by the client based on their necessity. Appointments and meeting are arranged when the client is in need of some outsourcing services. The outsourcing service providers are

contacted and shortlisted by our team. Annual reports and competitor web blogs are analysed to improve the client strategy.

Tool used (Development tools - H/w, S/w): Microsoft Office and other talent databases.

Objectives of the project: Fulfilling the consulting requests for the company's clientele.

Major learning outcomes: Nuances of consulting and departmental responsibilities in a company.

Details of papers / patents: Can't be disclosed.

Brief description of working environment, expectations from the company: My mode of work has been work from home for the whole PS-II duration. This mode made the working hours quite flexible but the work lasted till late nights depending on the deadlines. The team encourages us to learn trivia and current trends of the companies to understand the working sector in a better way. The manager expects timely delivery of quality work and maintaining professional etiquette for team meetings with clients.

Academic courses relevant to the project: The academic courses relevant to my work are only some of the economics electives.

Name: NEHA SAINI (2018B4PS1168P)

Student write-up

PS-II project title: Marketing Research on US GTM TARGETS

Short summary of work done during PS-II: For the assigned targets I do data collection for the companies/executives interested in AI/ML, AR/VR, IOT, HIA (Hyper intelligent automation) or Future of work (Confluence) etc. We keep focused on some major events like our March

confluence event on “future of work” which is a great connection to mention to contacts or at events.

Tool used (Development tools - H/w, S/w): Google Chrome, Hubspot, Email finder tools (like RocketReach, email hunter etc), Draup, MS EXCEL, MS WORD, LinkedIn, Sales Navigator, MS Outlook and Microsoft Teams.

Objectives of the project: The main objective of US GTM targets research is to find topics where companies/executives align with our core expertise and/or available content that we can use to make a strong introduction.

Major learning outcomes: As a member of the team, I learnt how to recommend resources and send emails to our clients.

- ❖ As a member of the team, I gained an understanding of what data is required and how to use it. Excel can be used to extract and filter data.
- ❖ Work ethics, such as professionalism, respect, and honesty, are essential. Witnessing life occurrences of each ensures dependability.
- ❖ Learnt how to find and contact appropriate profiles, as well as how to collect data for them.
- ❖ I learnt how a Corporate Space works and how multiple tiny efforts from different people may make a big difference. The fate of a larger enterprise is eventually decided by a group of people.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: Working environment is as good as expected.

Academic courses relevant to the project: Yes they were relevant.

Name: AJAY GHOSH K J (2020H1060144G)

Student write-up

PS-II project title: Statergizing MNCs through Open Innovation Consulting

Short summary of work done during PS-II: I was a part of CoNXT team of Zinnov that mainly strategizing startups and MNCs . I was engaged with multiple projects during my internship.

Tool used (Development tools - H/w, S/w): MS powerpoint, MS Excel, MS Word.

Objectives of the project: To work on client requirements, which varies with each project. To provide them insights into what can be done to improve company performance.

Major learning outcomes: Working of management consulting, team work, interpersonal skill, presentation skill.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: The company employees were friendly. There was strong interaction and teamwork in my team. The kind of work you get is really dependent upon the team in which you are asked to work in. Overall a peaceful PS station from my experience.

Academic courses relevant to the project: Principles of Management, Marketing Research.

PS-II Station: Zluri, Singapore

Faculty

Name: Manoj Subhash Kakade

Student

Name: ANIRUDH SHARMA (2017ABPS0357P)

Student write-up

PS-II project title: Using Node.js framework to build REST APIs for a web application

Short summary of work done during PS-II: Integrated multiple SaaS applications for Zluri dashboard.

Tool used (Development tools - H/w, S/w): Javascript (node.js), MongoDB, Postman, Notion, Slack, Jira, Retool, MongoDB Compass, Github, AWS.

Objectives of the project: Using Node.js framework to build REST APIs for a web application.

Major learning outcomes: 1. Learnt Typescript, MongoDB, NodeJs, Authorization, REST APIs, JSON, JWT and Curl.

2. Learnt to use Mongo Compass.

3. Learnt to use Jira and Notion.

4. Learnt how to read api documentation.

5. Importance of communication in the team.

6. Task management in teams using Saas products like Jira and notion.

7. Importance of meetings and demos on a regular basis in a team.

Details of papers / patents: Nil

Brief description of working environment, expectations from the company: It was a very satisfying and productive experience. Being an early startup, Zluri provides ample opportunities to work with skilled tech people from all over the country, it's easier to switch teams in order to add extra skills to your profile while working on building the Zluri platform to be the most used Subscription management platform out there.

Academic courses relevant to the project: NA

Name: MUKUL GUPTA (2018A4PS0596P)

Student write-up

PS-II project title: Integrations at Zluri

Short summary of work done during PS-II: The work was mostly building integration. Every week I was assigned 4-5 integrations depending upon other works. The other works were working on few customer support tickets and also helping the company with stuffs like data entry, etc. I also got a chance to write the documentation for the integration process for others reference.

Tool used (Development tools - H/w, S/w): Javascript, NodeJs, MongoDB, AWS, Postman, Retool, GitHub Notion and Jira.

Objectives of the project: The objective of the project is to integrate as many SaaS platform to Zluri's platform as possible.

Major learning outcomes: By this internship, I got a good control over building APIs, Reading API documentations, working with javascript, nodeJs and making integrations. I also got hands on experience with tools like MongoDB database, AWS and Postman.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Everyone is just so friendly. You can directly reach out to anyone despite of their seniority or position in the company.

Academic courses relevant to the project: Data Structures and Algorithms, Object Oriented Programming, Database Systems, Computer Programming.

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