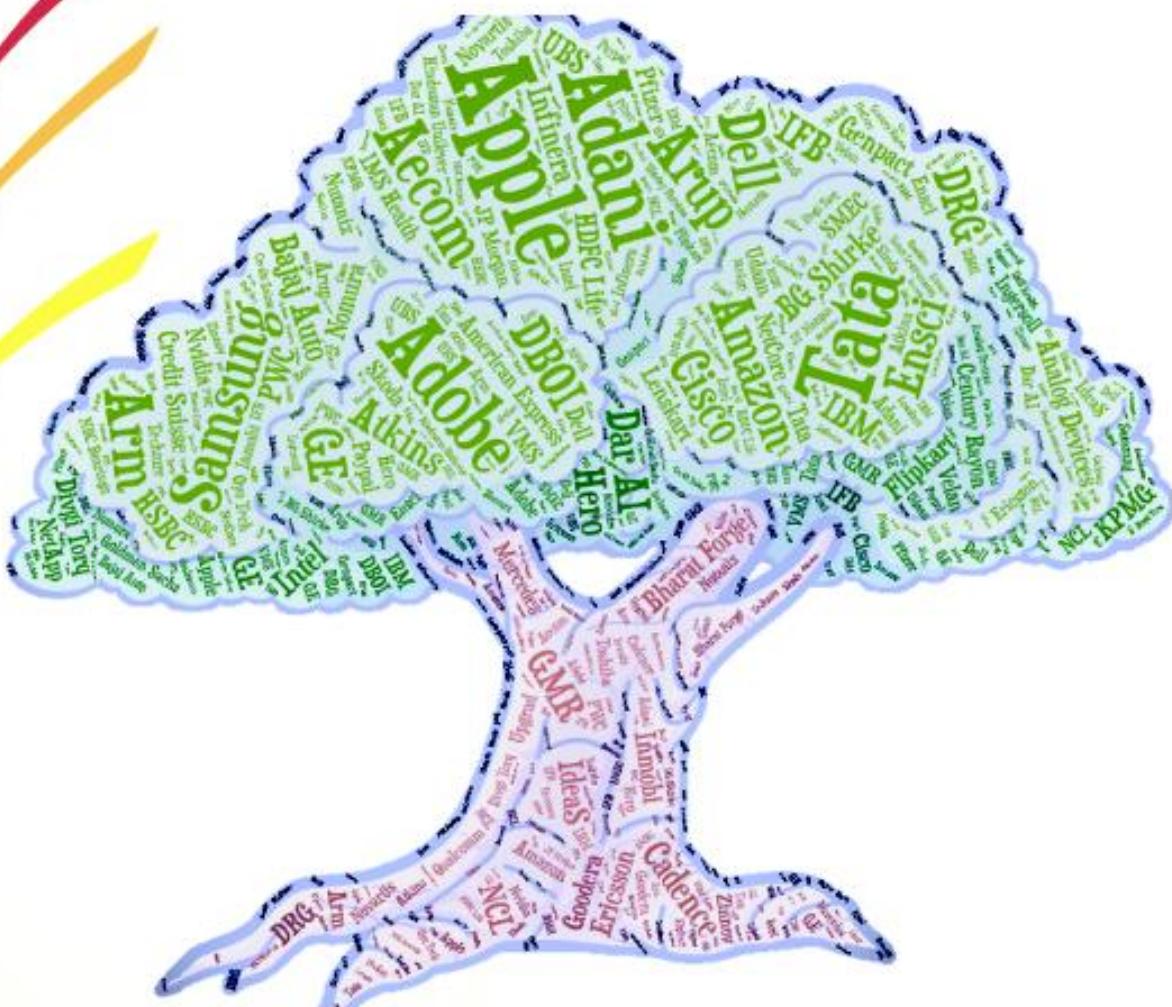




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Practice School Division

PRACTICE SCHOOL - II

CHRONICLES



Publication Cell
- Practice School Division

From the Desk of the Editor

It is my great pleasure to bring forth the 11th edition of the PS-II Chronicles. This edition features over 690 articles from mentors, students and PS faculty sharing their experiences from the II Semester of 2020-2021. This huge increase in numbers is 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– thereby increasing awareness in the student community.
- Increasing awareness among faculty about the nature of work happening atvarious 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. Thanks for making the 11th edition an even more bigger and better experiences.

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, 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 psd@pilani.bits-pilani.ac.in or at anil.gaikwad@pilani.bits-pilani.ac.in

Anil Gaikwad

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Name: Prof. Srinivas kota.....	730
Student.....	730
Name: AKSHAT BIRWA (2019H1060040G)	730
Name: RAHUL VENKATESH (2019H1060529P)	731
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Name: Prof. Srinivasa kota.....	732
Student.....	732
Name: SAITEJA PAIDIMARRI (2019H1230051G)	732
Name: VARUN UNMESH DHOKE (2019H1230053H)	733
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Faculty.....	734
Name: Prof. Sandeep Kayastha	734
Student.....	734
Name: SHREYAS S VASTRAD (2016B5AA0749G)	734
Name: BHAVIK PUNJARI (2017A4PS1207H)	735

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Faculty.....	737
Name: Prof. Annapoorna Gopal	737
Student.....	737
Name: HARSH VARDHAN MISHRA (2016A1PS0643P)	737
Name: JOSHUA THOMAS THAMPY (2016B2A40598G).....	738
Name: NIMISHA JAIN (2016B4A10504P).....	739
Name: KUMAR ANKIT (2016B5A10746G)	740
Name: AVI SHRIVASTAVA (2017A4PS0428G)	741
Name: RAHUL BUBNA (2017A5PS1075P)	742
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Faculty.....	743
Name: Prof. Swarna Chaudhary	743
Student.....	743
Name: ANSHUL CHANDRA (2017A8PS1185P).....	743
Name: GRANDHI ABHINAV (2017AAPS0270G)	744
Name: ANJALI KIRORIWAL (2017B2TS1230P).....	744
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Name: Prof. Swarna Chaudhary	746
Student.....	746
Name: SATYAM KUNAL (2017A1PS0029P)	746
Name: LAVAK SHARMA (2017A1PS0847P)	747
Name: ANEESHA PANDA (2017A8PS0817H).....	748
PS-II Station: Versa Cloud ERP Inc, – Non-Tech, Portland	749
Faculty.....	749
Name: Prof. Gaurav Nagpal.....	749
Student.....	749
Name: ROHEL DHAM (2016B1A40935H)	749
PS-II Station: Verzeo Edutech Pvt. Ltd., -Tech, Bangalore.....	749
Faculty.....	750
Name: Prof. Gaurav Nagpal.....	750

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Name: SANDEEP SARASWAT (2019H1490818P)	750
Name: AKSHAYA. M (2019H1490843P).....	751
Name: AMANDEEP SINGH (2019H1490845P).....	752
PS-II Station: Vestas Technology Ltd., Chennai	753
Faculty.....	754
Name: Prof. Raghuraman. S	754
Student.....	754
Name: ALOKKAN KRISHNA PRIYA (2019H1430100H).....	754
PS-II Station: VMware Software India Pvt. Ltd., Bangalore	755
Faculty.....	755
Name: Prof. Chandra Shekar R.K	755
Student.....	755
Name: KHUSHBOO KUMARI (2017A7PS0012P)	755
Name: PRAKHAR GUPTA (2019H1030157H).....	756
Name: PRASHANT KUMAR (2019H1120064P)	757
PS-II Station: VMware Software India Pvt. Ltd., Pune.....	758
Faculty.....	759
Name: Prof. Sonika Chandrakant Rathi.....	759
Student.....	759
Name: PRAKHAR SRIVASTAVA (2016B5A70438G)	759
Name: PAARTH DASSANI (2017A7PS0965G)	760
PS-II Station: Walmart Global Technology Services, Bangalore	760
Faculty.....	761
Name: Prof. Vimal S. P	761
Student.....	761
Name: AMAN KUMAR SINGH (2016B2A70520G).....	761
Name: GANDHI ATITH NIKESHKUMAR (2017A7PS0062P)	761
Name: YASH CHATURVEDI (2017A7PS0078G)	763
Name: RITVIK AGARWAL (2017A7PS0136G)	764
PS-II Station: Wavelabs Technologies, Hyderabad	764
Faculty.....	764

Name: Prof. Mohammad Saleem J Bagewadi.....	764
Student.....	765
Name: LAAWANYA KISHOR (2017A8PS0580G).....	765
Name: SOUJANYA PATIL (2019H1490865P).....	765
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Faculty.....	766
Name: Prof. Preeti N. G.....	766
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Name: ANIMESH MISRA (2019H1230048G)	767
Name: NARENDRA SHRIKANT TIWARI (2019H1230527G)	768
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Name: DESHPANDE GAURI SHEKHAR (2019H1400074G)	770
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Name: Prof. Samata Mujumdar.....	771
Student.....	771
Name: ALTEKAR NIKHIL RAJU (2019H1060028P)	771
Name: Shakti Mohanty (2019H1410127P)	772
Name: TIDKE MALHAR DEVIDAS (2019H1410132P)	773
Name: PRAKHAR MOHAN KAUSHIK (2019H1420142P).....	774
PS-II Station: Women Development & Child Welfare Department, Hyderabad.....	775
Faculty.....	775
Name: Prof. Sandeep Kayastha	775
Student.....	775
Name: NARKEDAMILLI VENKATA SAGAR (2017A4PS1166P)	775
PS-II Station: Xilinx India Technology Services Pvt. Ltd., Hyderabad.....	776
Faculty.....	776
Name: Prof. Krishnendu Mondal	776
Student.....	776
Name: AYUSH TIWARI (2016B4AA0454G).....	776
Name: PARAS VAISH (2016B5A30860H).....	777
Name: SRIJAN NIKHAR (2016B5AA0474G)	778

Name: NEILALOHITH SHARMA (2017A3PS0202G)	778
Name: P. ARUN KUMAR REDDY (2017A3PS0286P).....	779
Name: KANISHK SINGH RAGHAV (2017A3PS0366P)	780
Name: AVNISH TIWARI (2017A3PS0443H)	781
Name: REETANK RASTOGI (2017A3PS0542H).....	782
Name: PRABHMEET SINGH CHILANA (2017AAPS0378H).....	783
Name: RAHUL RAJENDRA SHANBHAG (2017AAPS0995G).....	785
PS-II Station: Young Man India, New Delhi.....	786
Faculty.....	786
Name: Prof. Nithin Tom Mathew	786
Student.....	786
Name: SHIVAM KUMAR (2019H1410103G)	786
PS-II Station: Zendrive India Pvt. Ltd., Bangalore.....	787
Faculty.....	787
Name: Prof. Chennupati Rakesh Prasanna.....	787
Student.....	787
Name: AMISHA KOTHARI (2017A3PS0194P)	787
PS-II Station: Zeotap India Pvt. Ltd., Bangalore.....	788
Faculty.....	788
Name: Prof. Ankur Pachauri.....	788
Student.....	788
Name: MALAIKA RASTOGI (2016B1A70926P).....	788
PS-II Station: Zeta (Directi), Bangalore.....	789
Faculty.....	790
Name: Prof. Chennupati Rakesh Prasanna.....	790
Student.....	790
Name: NAMAN DEEP SRIVASTAVA (2016B4A70891P)	790
Name: MRINAL PRADHAN (2017A7PS0453H)	791
PS-II Station: Zetwerk Manufacturing Businesses Pvt. Ltd., Bangalore	792
Faculty.....	792
Name: Prof. R. S. Reosekar.....	792
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Name: NITISH VERMA (2019H1410551G).....	792
Name: PRATIK DASHORA (2019H1420135P)	793
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Name: Prof. Shree Prasad Maruthi	794
Student.....	794
Name: ASHWIN SWAMINATHAN. S (2019H1410085G)	794
PS-II Station: Zinnov Management Consulting Pvt. Ltd., (Non-Tech), Bangalore	795
Faculty.....	795
Name: Prof. Annapoorna Gopal	795
Student.....	795
Name: IYER AMADHYA AMUTHAN (2016B2A10661H).....	795
Name: PURAMSETTI VENKATA UDAY MANIKANTA SAI (2017A1PS0336G)	796
Name: NATARAJAN KRISHNA (2017A1PS1150P)	797
Name: MANAV GANDHI (2017A3PS0234P)	799
Name: CHINMAY NEMA (2017A3PS0337P)	799
Name: ARPIT RAJVANSI (2017A3PS0456G)	800
Name: UPPADA AVINASH (2017A3PS0902G)	801
Name: PIKLU PAUL (2017A7PS0006P).....	803
Name: GRANDHI AMSHUDHAR (2017A8PS0612H)	804
Name: NAMAN GUPTA (2017AAPS0991G).....	805
Name: SOMLINA MUKHERJEE (2017AAPS1238H)	805
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Faculty.....	807
Name: Prof. Annapoorna Gopal	807
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Name: PRATEEK AGRAWAL (2016B1A10627G).....	807
Name: SONAWANE NEERAJ MILIND (2017A3PS0433G)	808
PS-II Station: Zluri, Singapore.....	808
Faculty.....	808
Name: Prof. Manoj S Kakade.....	808
Student.....	809

Name: YATHARTH SINGH (2016B2A20845P)	809
Name: ADITYA SINGH (2016B3A80300G)	809
Name: TEJASWINI JUPUDI (2017AAP0418G)	810
PS-II Station: Zwende Design Tech Pvt. Ltd., Bangalore	811
Faculty.....	811
Name: Prof. Srinivas Kota	811
Student.....	811
Name: MANTRA MANAN SARASWAT (2016B5A20641P)	811

PS-II Station:Aditya Auto Products & Engg (I) Pvt.Ltd., Bangalore

Faculty

Name: Prof. Dinesh Wagh

Student

Name: MARATHE KETAN VIKASBHAI(2019H1410089H)

Student write-up

Short summary of work done during PS-II: We did two projects. In first project, we designed automatic greasing station to obtain uniform greasing over rail component of the window regulator with minimum operator and less cycle time. In second project, we designed a fixture and fixture plate of car door striker component to perform series of operation like riveting operation, engraving operation, etc.

Tool used (Development tools - H/w, S/w): Autodesk Inventor, Solidworks, Python, Raspberry Pi.

Objectives of the project: In first project, to obtain the uniform greasing over rail with fixed quantity of grease using automation. In second project, objective was to design fixture, so that series of operation can be done with less interference of operator.

Major learning outcomes: Learnt to design low cost automation.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment of the company was very nice. Mentor was too supportive. All the employees were

also helping whenever necessary. If we didn't understand anything then they will explain it thoroughly and if possible they will make a arrangement to explain it with on site setups.

Academic courses relevant to the project: Mechanisms & Robotics, Design projects, Product design, Research practice.

PS-II Station:Adobe Systems, Noida

Faculty

Name: Prof. Ritu Arora

Student

Name: SANKIT(2017A7PS0297H)

Student write-up

Short summary of work done during PS-II: My work proposes a general framework for building structural causal models (SCMs) with deep learning (DL) components. This work makes use of normalizing flows and variational inference to allow tractable inference of exogenous noise variables—a crucial step for counterfactual inference that is missing from existing deep causal learning methods. This work will be used in production for a major news agency to obtain causal understanding on user interaction with an article.

Tool used (Development tools - H/w, S/w): Python3 - Pyro, PyTorch, Keras, Tensorflow, Captum, Pytorch-lightning, Anaconda, GitHub.

Objectives of the project: Designing a causal model to study the key performance indicators for a content marketing application, and the various factors which influence it.

Major learning outcomes: Research methodology, replicating state of art approaches, conducting experiments at scale, detailed framework for causal modelling and deep learning projects.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: Adobe Noida (MDSR Lab) has a decent work life balance, and there is a lot of opportunity to learn new things. The research team is also very supportive .

Academic courses relevant to the project: Machine learning, Deep learning (Selected topics from computer science).

PS-II Station:AECOM, Mumbai

Faculty

Name: Prof. Pavan Kumar Potdar

Student

Name: AATHIRA C P(2019H1300578P)

Student write-up

Short summary of work done during PS-II: For this project, available data from traffic surveys were utilized to analyse the present situation and possible future conditions were predicted from the extracted data. Various scenarios, giving due importance to existing and predicted conditions were considered and analysed in depth. Simulation was done on these scenarios

using VISSIM so as to get a clear cut idea about possible situations which can arise in future. Results from simulation were taken to emphasize the importance of a metro station in the study area. Station area planning was done considering the aspects which can make the station stand out as a typical metro station with wide ranging facilities of multimodal integration, assured to travellers. Feeder route development was done using QGIS to understand the inflow and outflow of the metro station from nearby railway station or bus stop. Finally, cost estimate for developing such facilities was done to ensure economic viability.

Tool used (Development tools - H/w, S/w): VISSIM, QGIS, spatial manager.

Objectives of the project: The objective behind this project was to completely design a metro station from a transportation planner's perspective, integrating it to the level of multi modal planning. The project aims in implementing multimodal integration planning into more number of metro stations, which will help people and environment in a positive manner. Traffic models are developed and the same are tested to signify their relevance.

Major learning outcomes: This project has helped me in analysing the needs of the travellers from a transportation planner's perspective.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working conditions were very employee-friendly. The project was finalised giving due consideration to my areas of interest. All my colleagues were pretty helpful and there was no disparity towards me, being an intern. But for a learning experience, this was a great opportunity for me.

Academic courses relevant to the project: Transportation systems planning and management, Traffic engineering &safety, Transportation economics &finance.

Name: SOLANKI NISHANT KETAN(2019H1430103H)

Student write-up

Short summary of work done during PS-II: My work involved checking the designs of peripheral and carriageway drains, pier, pier caps (corbel design), box culverts, pump houses, manholes, formwork design for pier, reviewing construction methodology and sequences. Checking construction reference drawings with definitive design drawings of various structures. Submitting comments resolution sheets to the contractor for resolving issues in design, if any. Study of IRC and AASHTO code. Visiting site once in a month.

Tool used (Development tools - H/w, S/w): STAAD-Pro, MIDAS/Civil, AutoCAD, MS-Excel.

Objectives of the project: To construct a 29km access-controlled expressway connecting princess street flyover in south Bombay with Kandivali in the northern suburbs. Mumbai Coastal Road Project is divided into 2 phase, phase 1 (South Package), which connects from Marine lines-Princess Street Flyover and Bandra Worli Sea Link (BWSL). It comprises an 8-lane road reclaimed from the sea, bridge on stilts, elevated road, twin-tunnels under Malabar Hills, new green spaces, sea wall/breakwater wall and multiple interchanges for traffic dispersal. Phase 2 (North Package) involves constructing a northern extension between Bandra – Versova – Kandivali, which is currently not in the scope of this internship.

Major learning outcomes: This project gave me real exposure to the professional working environment & help me understand the working of government projects and various levels of checking involved before the execution. Mindfully preparing comments resolution sheet after checking as this is the major part of a submission.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work environment is very positive. My team members were helpful and very supportive. Every query will be cleared within a short span. We will be in frequent contact with seniors. Our opinions are taken seriously and thought over before taking a step in doing something.

Academic courses relevant to the project: Bridge engineering, Prestressed concrete, Earthquake engineering, Steel structures, Concrete structures.

PS-II Station:AgroStar, Pune

Faculty

Name: Prof. Sandeep Kayastha

Student

Name: ANUJ GUGLANI(2016B5A40465H)

Student write-up

Short summary of work done during PS-II: Learnt how to bring UX designs to life using React and working in a collaborative software development environment. Learnt skills required to work as a frontend engineer, including but not limited to API consumption, CSS, caching, bug fixing and general testing.

Tool used (Development tools - H/w, S/w): React, NodeJS, Postman, Chrome developer tools.

Objectives of the project: Gold service project: To enable anyone with access to crop images to be able to add the said crop to the crops database for the gold service, a task which was done manually every time a crop was to be added.

Knowledge management portal: To enable internal users at the retail stores of AgroStar to be able to diagnose the problem the customer(farmer) is facing and issue products for the same. Also, provide general insight to the farmer by following the journey of that crop through the timeline and suggest tips and products based on the same.

Farmer WebApp: Fixing current open issues and bugs, no new addition was done.

Major learning outcomes: Web development(intermediate), Code collaboration(Git), Software development life cycle.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Everyone was very receptive and always helped out whenever I got stuck at any point. People are very supportive and encouraging. Matched all expectations I had from a software development internship.

Academic courses relevant to the project: C++ programming, Computational physics, Pattern recognition.

Name: ADITYA KASAT(2017A1PS0939P)

Student write-up

Short summary of work done during PS-II: Major work was around writing MySQL query to obtain the appropriate information from the data warehouse (Big query used at Agrostar) for carrying out analysis.

Other major part was making dashboards using Tableau and Big query.

A project on making a machine learning model for image detection using python.

Using the company's existing data pipelines to push data from the data servers to Big query were a small set of tasks that was there throughout the internship.

Tool used (Development tools - H/w, S/w): Big query, Bit Bucket,Tableau, Python,R studio.

Objectives of the project: To locate faulty users based on their profile picture. Dashboards were made so that business decisions could be made based on the data. Carrying out analysis to understand the trends from the data about the business

Major learning outcomes: How to carry out analysis on data. Making dashboards, a brief overview of the data engineering role based on using data pipelines, writing configurations for the pipeline.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The people in the company are very approachable. But you have to make sure that you understand stuff by asking questions till you are clear on what needs to be done. Deadlines are tight. It's better to know stuff before joining as induction programme is very short (Big query is taught well but Python and machine learning modelling is not). So, if you are planning for hands on experience on modelling then it's good exposure but you have to know the basics.

Academic courses relevant to the project: Machine learning, OOP.

PS-II Station: Airmeet, Bangalore

Faculty

Name: Prof. Anjani Srikanth Koka

Student

Name: AKHIL DUKKIPATI(2016A8PS0677G)

Student write-up

Short summary of work done during PS-II: I have done market research on a wide range of domains for over 2000 companies to partner with Airmeet as a potential client. I worked on

devising marketing strategies for their products for these various businesses and organizations. I was assigned to work on HubSpot for inbound marketing, sales, and lead generation. I also worked on few assignments where I pitched demos of the platform to various clients to collaborate with Airmeet and gained experience on how to handle real-time corporate issues.

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

Objectives of the project: The objective behind this project is to generate ideas that will increase the user data, help businesses and organizations collaborate with Airmeet's platform so as to stand competitive in the market. For that initiative to happen, one must have a good idea about the current market scenario of Airmeet and how is it performing against its competitors. Through the help of this project, we looked to improve the sales conversion rate of various companies that partner with Airmeet.

Major learning outcomes: Market research, Sales development.

Details of papers/patents: Have not done papers

Brief description of working environment, expectations from the company: Friendly employees, good mentors and a healthy working environment. Expects everyone to be punctual and hard-working.

Academic courses relevant to the project: Business communication.

Name: MAMARDE TANAY VIJAY(2016B4A30478P)

Student write-up

Short summary of work done during PS-II: This project is basically to search both physical and virtual events for organizations like virtual conferences, virtual tradeshow, virtual fare show,

virtual job fair, virtual events for corporations, virtual graduation ceremony platform like career fare, virtual events for universities and meetups popping up everywhere which has now become an important part of the professional ecosystem to achieve marketing goals set for Airmeet, which is a virtual event platform which is easy to use and reliable.

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

Objectives of the project: The objective of this project is to collect data from the social networking sites like 10times, Linkedin, Hopin, Google, Meraevents.com, Alltechconferences.com regarding upcoming events or the events that happened in the past and their related information such as the event name, location, subject of the event, organizers, participants, etc. This information extracted in the form of CSV file is used by the company to send them invitations of an event, newsletters, advertisement campaigns, building sponsorships, bulk emails to convert the leads into clients which in turn increases the growth of the company.

Major learning outcomes: How to scrape events from websites using Python libraries and to create a CSV file.

Details of papers/patents: Webscraping is used to collect large information from HTML webpages and transfer it to Microsoft Excel spreadsheet in the form of CSV files. The extracted data can be utilized to develop contacts and do market research and competitor analysis.

Brief description of working environment, expectations from the company: The experience of working with startup company like Airmeet was very good. It gave us opportunities to learn new things such as web scraping and the applications of Python libraries. The coordination between mentor and the intern was very good and they were very supportive. All the activities were done in a smooth way and disciplined manner virtually in this pandemic. Good work was also appreciated by the mentor.

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

Name: PROJIT DEY(2017A1PS0893G)

Student write-up

Short summary of work done during PS-II: Airmeet is new virtual events platform in the market which acts as a replacement to conventional video-call platforms like Zoom, Google Meet etc. Airmeet is currently focused on generating revenue through B2B via custom plans and pricing set as per the clients requirements.

My task was to assist the growth team with lead generation and cold email outreach, which was directly related to the revenue generating process of the company. Daily target for leads and calls were set. The general workflow was:

1. Generate leads
2. Outreach via email
3. Set a demo call in case of positive response; remove from mailing list if negative
4. After demo call, discuss pricing
5. Proceed to close the deal if the client accepts pricing; negotiate with discounts if client objects to pricing
6. If client still does not like the pricing, mark deal as "lost" but keep in touch with them

Tool used (Development tools - H/w, S/w): Apollo, Skrapp for generating leads, Hubspot for email automation, maintaining activity records, email tracking, LinkedIn, Google, Bing to look for companies, events etc. for reaching out to Excel for keeping leads database, word and powerpoint for reports.

Objectives of the project: To assist the growth team with lead generation and cold email outreach, which was directly related to the revenue generating process of the company.

Major learning outcomes: Email outreach/outbound is a highly effective way to bring in new clients as the first point of outreach is awareness i.e. the prospect is notified about the product and how it can be useful for their company. Following up after the initial outreach is also important as it generates interest in the prospect about the product i.e. they are requested to schedule a call with a representative in case they are interested. Also, email contents should be

tuned and personalized in order to avoid being reported as spam and subsequently the email account being banned.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Entirely remote working company, which means there would be no physical office even after things become normal after COVID. Which also means that employees and interns will be expected to have steady internet connection for the entire working hours. Flexible working schedule - you can start and end whenever you want. Company HR organizes some webinars and fun activities periodically (participation is optional, of course). Quite friendly environment overall, mentors are very helpful and also very considerate in case you're facing any kind of trouble. Workload may feel a lot at the beginning but you will get used to it eventually.

Academic courses relevant to the project: Technical report writing, Business communication.

Name: SEEPANA TIRUMALA RAO(2017A2PS0819P)

Student write-up

Short summary of work done during PS-II: Airmeet is a virtual conducting events platform. As an Intern, We search for the events data and scrap data by using different websites. Finally, give demos to the clients and negotiating prices with them about our platform.

Tool used (Development tools - H/w, S/w): MS EXCEL, APOLLO, OCTOPARSE, SNOV, METABASE, HOTSPOT.

Objectives of the project: 1. To negotiate prices with clients.
2. Explore about Airmeet platform.
3. Emails outbounding.

Major learning outcomes: 1. Identify growth opportunities for the client organisation.

2. Frame business growth challenges using dynamic and systemic analysis tools.
3. Use formal criteria to choose amongst growth opportunities for the client organisation.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: In Airmeeet, it is totally remote work. Working environment with my colleagues are good. Company established in the year 2019, gradually increasing its revenue. Overall good experience.

Academic courses relevant to the project: Principles of management, Professional ethics, Applied philosophy.

Name: LUV NATH(2017A3PS0447G)

Student write-up

Short summary of work done during PS-II: • Aim: To develop newer growth strategies and optimize the existing ones.

- Designed a growth experiment in order to target new customer segments.
- Analyzed the existing communities in order to come up with the most frequent use cases and plan types in order to prioritize the relevant features in the product and hence improve the offering.
- Conducted market research in order to come up with the total addressable market for Airmeeet in the sports and SaaS sector.
- Worked on modifying the existing deliverables in order to assist the sales and marketing teams to achieve their targets better.

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

Objectives of the project: To develop newer growth strategies and optimize the existing ones.

Major learning outcomes: Improved soft skills like communication, negotiation and developed problem solving and analytical skills.

Details of papers/patents: None

Brief description of working environment, expectations from the company: As a learning experience, it is overall a positive experience since it involves working in a hypergrowth environment.

Academic courses relevant to the project: Market research.

Name: RITVIK GARG(2017A4PS1415H)

Student write-up

Short summary of work done during PS-II: Worked as sales development representative. Day to day duties involved lead generation by reaching out to event organizers and various stakeholders in the company via LinkedIn, email and cold calling. Doing market research and analyzing the type of events being organized by different companies across various sectors and developing growth strategies to outreach these companies. Giving 1-1 product walkthrough to the clients.

Tool used (Development tools - H/w, S/w): Google sheets, Google slides, HubSpot, Octopus CRM, InTouch CRM, Apollo.io, Skrapp.io.

Objectives of the project: Growth strategies and expansion of Airmeet in India.

Major learning outcomes: Improved communication skills, Apollo.io, Skrapp.io, HubSpot CRM, Octopus CRM, InTouch CRM.

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: Market research, Operations.

Name: AKASHDEEP DWIVEDI(2019H1490802P)

Student write-up

Short summary of work done during PS-II: Work was in the growth team, that meant to reach companies and people in it by using simple and cost effective methods. From lead scraping to reaching them via email and LinkedIn, the work was all around it. Different industries like pharmaceuticals, events, IT, recruitment etc. were targeted and worked upon.

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

Objectives of the project: Objective of the project was to learn about sales and its cost effective ways.

Major learning outcomes: Use cases of different industries for organizing events and cheaper ways to reach out to them.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: Working environment was WFH and company culture was awesome, given the fact that it is startup and run by efficient people. There was no restrictions of timing and helping nature of executives and mentors.

Academic courses relevant to the project: Yes, being a management student, it was relevant.

Name: PRACHI(2019H1490825P)

Student write-up

Short summary of work done during PS-II: Knowledge base management and competitive analysis.

Tool used (Development tools - H/w, S/w): Google sheets, Airmeet, Microsoft word.

Objectives of the project: To create a Bulletproof knowledge base so as to decrease companies man hours and hence cost for customer care.

Major learning outcomes: How to create an effective and efficient knowledge base. How a good support system can decrease cost to the company.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Very good working environment and employee friendly.

Academic courses relevant to the project: Marketing, Operations.

PS-II Station:Alien Developers, Hyderabad

Faculty

Name: Prof. Mahesh Kumar Hamirwasia

Student

Name: BHATT DIGANT MANISH(2019H1430149P)

Student write-up

Short summary of work done during PS-II: Analysis, design and modelling of elevated helipad supporting system on top of 30 storey residential building. Design and analysis of slab in residential unit, strengthening of tower columns, optimization of core walls and flat walls. Design and analysis of stair case and landing slab.

Tool used (Development tools - H/w, S/w): CSI ETABS 18, CSI SAP 2000, CSI Safe v16, MS Excel.

Objectives of the project: Design and analysis of high-rise residential tower.

Major learning outcomes: Analysis, design and modelling of elevated helipad supporting system on top of 30 storey residential building. Design and analysis of slab in residential unit, strengthening of tower columns, optimization of core walls and flat walls. Design and analysis of stair case and landing slab.

Details of papers/patents: N.A.

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

Academic courses relevant to the project: Design and analysis of multi-storey building, Earthquake engineering, Design of RCC structures.

PS-II Station:AlmaConnect, Gurgaon

Faculty

Name: Prof. Gaurav Nagpal

Student

Name: HIMANI SHARMA(2017B2TS1228P)

Student write-up

Short summary of work done during PS-II: Worked as business development and operations Inter: Business development of the new job consulting program, where cold calling all those candidates who shows some activity on the platform and getting these potential job seekers on board followed by getting their talent profile filled on AlmaConnect's platform on google meet itself. The major agenda was to get these premium pool candidates placed in their desired company and in return a small success fee was charged.

Account management: Handled 17 corporate clients on daily basis by posting and promoting their jobs on AlmaConnect's platform and meeting their application requirements on daily basis. The main agenda was to share potential hire with the client and following up for further process until the candidate is hired by the company. Here also a small fees is charged per hire from the company.

In short: Making a match from JC program and job openings from corporate clients, to get the maximum revenue generated for the organization.

Tool used (Development tools - H/w, S/w): Google sheets, Applicant tracking system(ATS), Microsoft office.

Objectives of the project: To get the closures in the end leading to revenue generation for the company and learn how the recruitment industry works.

Major learning outcomes: Soft skills enhancement, Basic excel, Negotiating with clients, Account management, Resume screening.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Very motivating and helping executives who help you on each step in case you face some issues.

Academic courses relevant to the project: Market research, Operations.

PS-II Station:Altair - Software Development, Bangalore

Faculty

Name: Prof. Srinivas Kota

Student

Name: ROHIT KUMAR SHARMA(2019H1060513H)

Student write-up

Short summary of work done during PS-II: I am part of the hyperworks core development team, which works in command API. Initially, I was involved in bug fixing related to unit conversion, principal axes & mass moment of inertia calculation. After that, they assigned me a project to analyze the command file by adding a timestamp. This project is divided into three phases where; the first phase involves the addition of timestamps; the second phase consists of the implementation of data analysis on command file data by writing the Python script; the final stage includes the GUI development for analyzing data. This project is a part of Altair's future development to understand user behavior by analyzing the command file.

Altair's old API has some problems while calculating the mass moment of inertia. So, apart from the command analysis project, I got an opportunity to work on the real-time development of new method based on finite element approach to calculate mass moment of inertia.

Tool used (Development tools - H/w, S/w): C++, Python, TCL, Hyperworks, Visual studio, VS code, Qt designer, Perforce P4V, Jira, Compose.

Objectives of the project: 1. A prototype project to analyze the command file by adding time stamping. 2. Develop a new C++ function to calculate mass moment of inertia based on the finite element method.

Major learning outcomes: Object Oriented Programming, Importance of code structure, Prioritizing the things in complex work and gained sufficient knowledge on the tools mentioned above.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Altair treats interns as an employee and allowed me to work on real-time issues apart from the project. I am part of the hyperworks core development team, which deals with command API. My team members are very cooperative. They helped me whenever I was stuck at some point. The best thing about Altair is flexible timings. They believe in the quality of work; that's why there is no working time pressure from the company. Even they have a table tennis room where we can refresh ourselves when we feel bored. We can also ping anybody from other teams for doubt clarification.

Academic courses relevant to the project: Advanced engineering mathematics, Finite element method.

PS-II Station:Amazon - Machine Learning, Bangalore

Faculty

Name: Prof. Seetha Parameswaran

Student

Name: SHREYAS SUNIL KULKARNI(2016B4A70649H)

Student write-up

- Short summary of work done during PS-II:** 1. Project was on attribute based design insights
2. Built a dashboard UI to display the insights
3. Built ML models and variational AutoEncoder to generate the insights

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

Objectives of the project: Help sellers increase sales by improving physical attributes of the their product.

Major learning outcomes: Production level code, Corporate research and it's applications.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Decent working environment, but high expectations.

Academic courses relevant to the project: Machine learning.

Name: RUDRARAJU SACIN VARMA(2019H1030014P)

Student write-up

Short summary of work done during PS-II: The goal of the project assigned was to extract count of the contents of a product from its product image on the amazon catalog. To realize this, I mainly worked with BERT (NLP transformer model) based deeplearning model. Performed various experiments by modifying the structure of train-test data, and post processing of the output given by the deep learning model, to improve the precision and recall of the model on the task of extracting the count value.

Tool used (Development tools - H/w, S/w): Python programming language, redshift database, AWS S3, AWS EC2, AWS sagemaker, huggingface transformers (open-source transformer models library).

Objectives of the project: To extract count of the contents of a product from its product image on the amazon catalog to fix defects in the product title/description.

Major learning outcomes: * Learnt about NLP models like BERT and concepts like self-attention.

* Prioritizing based on impact created by task.

* Learnt the process of productionizing a model at amazon.

Details of papers/patents: The paper "LayoutLM: Pre-training of text and layout for document image understanding" was used extensively to realize the project.

Brief description of working environment, expectations from the company: It was very positive environment where I always encouraged to discuss my ideas with the team and run experiments pertaining to them. Everyone was very much helpful and they always knew which website or document I had to refer to gain knowledge over a particular subject or problem. The company/team expects you to take ownership of the problem that you are solving i.e., know the project developed to solve the problem in-and-out and also make suggestions to improve upon the solution to better meet the actual requirements of the customer even if it might slightly

diverge from the scope of the project or improving the problem statement to satisfy the customer expected requirements.

Academic courses relevant to the project: Machine learning.

Name: BHATIA RAVI HARESH RENU(2019H1030508H)

Student write-up

Short summary of work done during PS-II: During my internship, I developed a multilingual deep learning classification model for search relevance. I tried various pre-trained models such as BERT, DistilBERT to use for transfer learning of my model. I used a multistage classifier setup to improve model results. I learnt and implemented various machine learning and deep learning concept such as cross-validation, hyperparameter optimization, semi-supervised learning, etc. I learnt and worked on cutting-edge tools and technologies such as TensorFlow and Keras to build models, transformers to load pre-trained BERT models, Scikit-learn to plot confusion metrics, pandas to work with data and Sagemaker to deploy model, etc. Also, I read various research papers related to my work and present a paper on multi-objective ranking optimization to the team.

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

Objectives of the project: An internship aims to develop multilingual deep learning model that will classify search results and compute the search relevance score using semantic matching.

Major learning outcomes: To improve search relevance using natural language processing and machine learning.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working in Amazon was great learning experience. I worked on real life problem of Amazon search. I used natural language processing and machine learning concepts to build various model for search relevance. I learnt many tool and technologies of amazon such as AWS sagemaker, working on EC2 machines etc. I also read multiple research papers and got an opportunity to present one paper to team. My team was very helpful.

Academic courses relevant to the project: Machine learning.

PS-II Station:Amazon - Operations Manager, Delhi

Faculty

Name: Prof. Arun Maity

Brief write-up on PS-II station :Amazon requires managing skills and improvement in their operations.

Student

Name: VISHAL KUMAR JHA(2017A1PS0756P)

Student write-up

Short summary of work done during PS-II: The major work consisted of handling the Inbound process of Amazon operations of a fulfillment center. Achieving the daily volumes while not compromising on the quality of the work was an important target. Other than looking after the daily working of an area manager, I had been allotted a project in which I needed to improve the productivity of one of the major processes. To achieve this, the idle time of the associates were monitored and their rates were tracked. The major reasons for high idle time were identified and their solutions were identified.

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

Objectives of the project: Improving the stow productivity.

Major learning outcomes: Manpower management, Understanding how E-Commerce companies deliver efficiently, software / languages like Excel and SQL.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: In Amazon, the interns are treated as their full time employees and also expected to work as the same. Since it's a field job, we are expected to work on the floor for around 10 h a day. Several safety measures are present considering the current pandemic. Amazon expects us to work diligently and practice their principles strictly and adhere to them. We are expected to take ownership of the work and do our duties without any delay. We should always do the root cause analysis and dive deep into the problem, attack process and not the people. At certain times, we are expected to make decisions and show bias for action.

Academic courses relevant to the project: Supply chain management.

PS-II Station:Amazon - Operations Manager, Pune

Faculty

Name: Prof. Arun Maity

Student

Name: VISHNUPRIYA SRIVASTAVA(2017ABPS0325P)

Student write-up

Short summary of work done during PS-II: My project was on improving miss scan metric in the sort center. Involved interaction with various teams, brainstorm, analysis of daily data & automating the process.

Tool used (Development tools - H/w, S/w): Excel, Amazon's Tools.

Objectives of the project: Worked on two projects, first one was miss scan reduction & second one was improving the problem solving area.

Major learning outcomes: Critical thinking, End-to-end operations & supply chain.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Working environment is very good, everyone helps a lot in projects. Project assigned needs a lot of analysis for which one needs to know the entire operation & tools, which makes a bit challenging at first but soon becomes pretty easy to analyze. There's an added advantage if you are good in Excel macro.

Academic courses relevant to the project: SCM, Manufacturing management, PPC.

PS-II Station:Amazon Development Center, Bangalore

Faculty

Name: Prof. Vishwanathan Hariharan

Student

Name: G ADITYAN(2016B1A70929P)

Student write-up

Short summary of work done during PS-II: Part of the Physical Retail Integrated Management and Supply Chain(PRIMS) ISC team. It is a suite of tools and services foundational to operate physical retail stores and centralized kitchen/warehouse operations. This spans tools for in-store operations, services to track inventory and accounting, services for upstream supply-chain functions, tools to manufacture food at scale, and regulatory food safety services.

Main Project: Thor dashboard feature and infrastructure enhancements. Thor dashboard automates the tasks which require manual effort in Lothario service (expiry tracking system) from PMs. Developing the back-end infrastructure of the dashboard from scratch (infrastructure as code); Feature additions as per business requirements.

Tool used (Development tools - H/w, S/w): TypeScript, Python, JavaScript, AWS CDK, AWS resources.

Objectives of the project: Thor dashboard feature and infrastructure enhancements.

Major learning outcomes: Learning new programming languages and frameworks; Documentation of my work; Amazon's leadership principles; Communication with PMs and business people.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: Daily meets to give work updates, 2-week sprint models, helpful teammates, WLB may get affected.

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

Name: INDRANEEL GHOSH(2016B1A70938P)

Student write-up

Short summary of work done during PS-II: Worked on building key features of Amazon's latest advertising based video streaming products miniTV and IMDbTV. My projects were linked with building critical features and optimizing the performance of the product.

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

Objectives of the project: Build and optimize the performance of a new video streaming app offering by Amazon.

Major learning outcomes: Amazon's leadership principles and coding standards. Writing technical documents.

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: Object Oriented Programming, Data Structures and Algorithms, Machine Learning, Cloud Computing, Database Systems.

Name: KUMAR DEOVRATA(2016B1A70939P)

Student write-up

Short summary of work done during PS-II: I worked in the out of country orders business domain of Amazon. I worked on adding functionalities on an internal portal of Amazon for two of

my projects and writing important back end modules of an upcoming service of amazon for rest of my projects. The work involved full stack development, React for the front end and NodeJs for the back end in two of my projects. I used java for the rest three of my project. The work really helped me understand the software industry good practices and standards.

Tool used (Development tools - H/w, S/w): IntelliJ, DynamoDB, S3, Lambda.

Objectives of the project: 1) Display carrier info data and PARIS Flag status of sellers on an internal Portal. 2) Write back end modules for an upcoming service at Amazon.

Major Learning Outcomes: 1) I learnt many AWS tools like Lambda, DynamoDB, S3 bucket etc.

- 2) I learnt programming languages like React, NodeJS, Java.
- 3) I learnt Programming core concepts like Object Oriented Programming, Database Management, Data structures and algorithms.
- 4) I got to learn about good programming practices in the software industry.
- 5) I also learnt about team work and collaboration.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work environment is good. I had a great learning curve. The level of ownership given to interns at amazon is amazing. I got to work in one of the most important and must win project of my team. I have to write important back end modules for the project. The company has given great learning to me overall with respect to learnings required in a software engineering role.

Academic courses relevant to the project: Yes. Data structures and algorithms, Object oriented programming and Database systems were relevant academic subjects.

Name: JAYESH NARAYAN(2016B1A80928P)

Student write-up

Short summary of work done during PS-II: I improved existing tools at Amazon. For my first project, I had to automate few tasks and modify existing things for a tool used by sellers to create product listings for refurbished items on Amazon. For my second assignment, I had to improve a portal by creating pages where I had to fetch data from different sources so that it can be viewed at one glance, saving time troubleshooting and making decisions.

Tool used (Development tools - H/w, S/w): H/W - MacBook Pro.

S/W - Java, Spring, React, Mockito, JUnit, Amazon Internal Tools, IntelliJ.

Objectives of the project: Improving tools and services used at Amazon.

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

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: It was entirely WFH. Company expected to work on the projects diligently and deliver value to customers. It was a great learning experience as we had ownership of the product we were building.

Academic courses relevant to the project: Object Oriented Programming.

Name: AVIRAL SETHI(2016B3A70532P)

Student write-up

Short summary of work done during PS-II: My work was majorly on the web application and rest APIS development for our teams product. I worked on both frontend and backend

development end to end. The project was developed using Java's spring framework following the MVC design pattern.

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

Objectives of the project: Full stack development of the web App and REST API development for our team's product.

Major learning outcomes: Java, Spring, Mockito, Javascript, API development, Team work, Workplace ethics, Scrum.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The overall working environment was really good and significant ownership of the projects was given to the interns. The team members were extremely helpful and always maintained and encouraged high development standards at work. There were no work timings as such and you were expected to complete the tasks assigned within the stipulated time.

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

Name: RUSHABH SANJIV SHAH(2016B4A70408G)

Student write-up

Short summary of work done during PS-II: At Amazon food, some data related to restaurants is revalidated at fixed intervals. If the data for a restaurant fails the validation, customer face problems when ordering. To address this issue, this project aims to detect the changes in the validation status for the restaurants and create an AWS Lambda to take the action that is required so that the customer experience is not impacted.

Tool used (Development tools - H/w, S/w): Java, Spring, Dagger, SQS, SNS, AWS Lambda.

Objectives of the project: Processing events corresponding to invalidation of data for restaurants using an AWS Lambda.

Major learning outcomes: Better understanding of system design principles, technical skills related to backend development in Java, exposure and chance to use Amazon web services.

Details of papers/patents: None

Brief description of working environment, expectations from the company: A good team to work in, teammates were quick to respond and help out.

Expectations from the company - Being proactive and curious to learn and contribute.

Academic courses relevant to the project: Data structure and algorithms, Object oriented programming.

Name: ANSHUMAN PATI(2016B4A70470H)

Student write-up

Short summary of work done during PS-II: I worked on two projects during the span of PS-II. My first project involved creating a software from scratch which will reduce the cost for various services and designs across the company. My second project was on creating a software to visualize and analyze the performance of various internal tools and software across the company and make comparative analyses on these tools.

Tool used (Development tools - H/w, S/w): Java, TypeScript, Python, IntelliJ IDEA, AWS Lambda, Amazon S3, DynamoDB, Amazon step functions, Elasticsearch, Kibana.

Objectives of the project: Project 1 - Develop a service to help users make more informed and frugal decisions while using internal tools. Project 2 - Create a software to help users visualize and analyze the performance of various tools across Amazon.

Major learning outcomes: Teamwork, Agile software development, Data analytics, Data visualization, Effective public speaking.

Details of papers/patents: Confidential documents of the company.

Brief description of working environment, expectations from the company: The working environment was very positive and the team members were very encouraging. I got the opportunity to work with global team with team members from Seattle, Vancouver, and Bangalore. My work on both the projects was recognized well and I was able to present my work for each of the project in front of various leaders at the organization. I received immense positive feedback for my contribution and the environment was very supportive throughout.

Academic courses relevant to the project: Object Oriented Programming Concepts, Database Systems, Software Engineering, Data Structures and Algorithms, Design and Analysis of Algorithms.

Name: CHIRAG KRISHNASWAMY A(2016B4A70752G)

Student write-up

Short summary of work done during PS-II: Project involved adding features to an automation framework. The framework was designed to automatically update configuration (text) files. The framework was written in Java and the configuration files followed a fixed grammar / syntax. Using the grammar specification, I had to (a.) Build a Parser to validate the syntax of the file before and after making any change and (b.) Build an Indexer to locate the point at which the update was to be made.

A new feature / component, called “Deployment Utilities” was also added to the framework. This component pushed the configuration changes to a CI/ CD pipeline and deployed the software package (with updated configurations) in a testing environment. This helped with integration testing. In addition to adding features and fixing bugs, I also had to write templates in Apache free marker syntax. The templates encoded the information about the required configuration changes. This information was ingested into the framework and passed onto the Indexer and other framework components.

Tool used (Development tools - H/w, S/w): Java, Springboot, Apache Free Marker, CI/CD pipelines.

Objectives of the project: Automate configuration update.

Major learning outcomes: Framework design and development; Templatization benefits; CI/CD pipelines.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Positive work environment. One mentor is assigned, but all team members were always willing to help. Have to attend daily scrum meetings (15-20 mins).

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

Name: P YEDHU TILAK(2017A7PS0021H)

Student write-up

Short summary of work done during PS-II: My project involved building a credit card application orchestrator web service. This service is used to handle and process applications for

Amazon branded credit cards. The first part of the project involved the design phase where I created class, component and sequence diagrams for each API present in the service. The credit card application orchestrator is a REST based web service. Technologies such as Java, REST, Guice, JUnit, AWS CloudWatch, DynamoDB, ECS and HERD were used. I coded multiple REST APIs inside the service and performed end-to-end testing for each API.

The next task I performed was load testing. First, based on our requirements I calculated baseline values for metrics such as Latency, TPS(Transaction per second), etc. Then I coded a Java client to simulate this traffic and load test our service. I modified to publish service and performance metrics to AWS CloudWatch, I then created dashboards to view these metrics.

Tool used (Development tools - H/w, S/w): Java, Guice, IntelliJ, Docker, AWS CloudWatch, DynamoDB, ECS and other Amazon internal tools/services.

Objectives of the project: The main objective of this project was to code new, fully-working REST APIs in the credit card application orchestrator web service. These APIs must be capable of creating new applications for the credit cards, process updates and credit-card information sent by the bank and orchestrate further tasks. The service must also meet performance expectations and be robust.

Major learning outcomes: I have learnt new concepts such as dependency injection, workflow orchestration and inversion of control, learnt frameworks such as ARest and Guice, learnt libraries such as Joda, Junit, Mockito and Google verify. I learnt various code practices and techniques that are commonly used in the tech industry. I learnt how to use various AWS services such as DynamoDB and CloudWatch. I learnt various software designing principles, techniques and methods such as Class, Component and Sequence diagrams.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: At amazon, I was part of the consumer payments team. The work atmosphere was great and the team was very welcoming. This internship provided a lot of new learnings and experiences, and gave a very good example of how life is in a big, corporate IT company. Overall, it was very enriching experience.

Academic courses relevant to the project: Object oriented programming, Software engineering.

Name: Rahul Jha(2017A7PS0036P)

Student write-up

Short summary of work done during PS-II: I worked on a feature of a product under development which is set to be launched this year (2021). The website is targeted for a specific set of customers and we had to develop it end to end, while keeping in mind the reusability of features when the platform is to be modified for another set of customers. I had to focus on scalability, extensibility and modifiability of the code with low redundancy and high readability. Since the project is still in its initial stage, I also had to work on the design of the feature and come up with different alternatives available to implement some functions and follow the best approach available.

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

Objectives of the project: I cannot reveal the details of the project, but the overview was that I had to develop a feature on a website to be launched for a set of customers on the Amazon website.

Major learning outcomes: Learnt full stack web development.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The work environment is very professional with daily scrums, biweekly sprints and grooming meets to update the tasks to be worked on by every member of the team. Everything is documented in wikis, docs, mails and SIMs (Amazon equivalent of JIRA) for future reference. The code is peer reviewed which provides a way to get advice directly from other team members to improve upon

coding practices. The employees here work hard, with several team members logging off late in the evening to meet their work goals. This is ideal for any aspiring software developer and help him/her to learn many things at Amazon.

Academic courses relevant to the project: OOPS.

Name: VENKATA NIKHIL MEDAM(2017A7PS0037H)

Student write-up

Short summary of work done during PS-II: My project is to develop a mechanism in which we can have complete control over the level of issuance of the cashback in order to prevent the abuse cases. The mechanism needs to be robust so that it is applicable in multiple use cases with minimal code change. We intend to use the mechanism to alter the level of issuance of cashback in potential abuse cases. This would be accomplished by using a deny listing solution which holds precedence over any other evaluation logic which could be used for determining the issuance level of cashback.

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

Objectives of the project: To prevent failures in calwing back issued cashback.

Major learning outcomes: Understanding the order workflow, cancellation workflow and return workflow.

Understanding the services in the current architecture and their purposes in different workflows.

Planning Phase - Document for identifying abuse cases

Design Phase - Design docs for high level design & low level design

Coding Phase - Coding the API, UI and evaluators

Testing Phase - Unit tests, Minimal beta deployment, QA testing

Reviewing Phase - Addressing comments, Answering queries

Details of papers/patents: Not Applicable

Brief description of working environment, expectations from the company: Amazon gives cashback for certain products which are eligible under certain promotions. The cashback can be gratified either immediately after the order has been confirmed or after the shipment has been dispatched. A major issue with issuing cashback is when any cancellation occurs. An order can be cancelled after the order has been placed until the order has been shipped. Once the order gets shipped it cannot be cancelled but it can be returned. When cashback has been issued after the order is confirmed and then the order gets cancelled, we observe abuse cases while clawing back issued cashback when the cancellation workflow goes through OMA or PCE. This problem can be side-stepped by having a mechanism which can pre-determine the cashback fulfillment issuance level. We need to build such a mechanism which is easy to use, maintain and update.

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

Name: SRISREYAS S(2017A7PS0065G)

Student write-up

Short summary of work done during PS-II: My team at Amazon works on SellerFlex, which acts as a portal for sellers to sell their products with the prime/ fulfilled By Amazon tag from their own warehouses while giving the customer the same experience as they would get from an Amazon fulfilment centre/warehouse, with SellerFlex also doubling up as a warehouse management software (WMS). My project consisted of two parts: Operational excellence, which involved multiple service ownership tasks for the various microservices behind SellerFlex's functioning, and the addition of new features to smart notifications, which are a series of notifications sent at specific times throughout the day based on sellers' performance to help them plan to meet their order backlog before shipping time. The work in operational excellence included the optimization of the LSS microservice for continuous deployment, onboarding of SellerFlex's notification service to the CloudAuth standard with a proxy endpoint for calls across

cloud regions, mitigation of security risks for ten SF microservices with a common vulnerability, upgradation of dependencies for Amazon Linux 2 migration in some services and to resolve logging issues in LSS, and sanitization of logs to remove sensitive data. The work on Smart notifications included the use of translatable strings to render notifications in multiple languages for localization, the displaying of metrics in the notifications, writing an auto-dismissal backend logic for notifications, and a feasibility study to examine the challenges involved in supporting shipping cut-off times worldwide for Smart notifications, which is currently a feature available in India only.

Tool used (Development tools - H/w, S/w): Java, Typescript, IntelliJ IDEA, Git, EC2 cloud desktop, Brazil, Apollo, CRUX.

Objectives of the project: Addition of metrics, translatable strings and auto-dismissal to Smart notifications, studying feasibility of worldwide rollout, reduction of operational workload and tech backlog of SellerFlex microservices.

Major learning outcomes: Writing clean and readable code, conforming to coding standards, software development and QA release process, information security standards, modular microservice-based design, Java 8 best practices for writing Coral API-based code, best practices for front-end development with typescript.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: My team had an open culture with a flat hierarchy, and my manager informed me that despite being an intern, I would be allotted tasks and be a part of meetings and follow the same protocols as a full SDE instead of simply working on my own project alone in isolation from the rest of the work in the team. As a result, I collaborated with many SDEs from the team, instead of being restricted to my official mentor alone. The team followed a process of sprint planning where work would be divided into two-weeks sprints, and everyone would add their tasks for the two weeks at the start of the sprint on a sprint board and allocate effort points to each task and prioritize. There was a short scrum meeting everyday where everyone would update the team on the progress in their tasks and remove effort points from the total based on the progress. All code changes were subject to code reviews and approvals before pushing the code to the mainline. The

release cycle was usually every two weeks and there would be a release planning meeting before the code freeze date where everyone was to add their changes and explain them. Following the code freeze date for a release, no one was to push code changes until QA testing and the final deployment for the release was complete.

Academic courses relevant to the project: Object oriented programming.

Name: SAMARTH JAIN(2017A7PS0067P)

Student write-up

Short summary of work done during PS-II: Currently there is no tool to display metrics/metadata for customers interacting with the services that my team has built. On-calls and PMs have to check such metrics manually. It would be beneficial to have a tool which will display desired metrics for any customer using a suitable UI. This X-ray service, I have deployed in the beta stage will enable to query metadata stored about the customers from the data lake that my team owns and maintains. The service also allows for a lot of modification of the dashboards from their UI itself, it's a BI tool. We can change themes, generate graphs based upon the data and add new filters and parameters to current existing queries. I also automated most of my deliverables using the AWS CDK.

Tool used (Development tools - H/w, S/w): AWS tools like Redshift, Glue, QuickSight, S3, CDK.

Objectives of the project: Build a service that enables PMs and on-calls to check customer metrics by querying data from the tables present in the internal data lake that my team owns and maintains.

Major learning outcomes: •One of the most important learnings is that of software development lifecycle and standard coding practices. I also learnt a lot about tools like Git which is very important for every software engineer.

- A very extensive analysis of the code gave me hands on idea of how to organize the code well so that it is clean, efficient and testable.
- Learnt the importance of the design phase, and that deep dives are one of the most important part of building any project.
- Learnt how to work as part of team, and realised that code reviews and design reviews are a crucial step that benefit hugely in the long run.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment was great. Everyone at Amazon has been really helpful as well, especially my team members. They have always supported me and helped me deliver appropriately. The expectations of the company is to follow a common software development lifecycle, starting from Deep Dive, to Proof of concept, design review, implementation, testing and review. All of these stages were well documented and clearly explained from my side as well, and I delivered the end product in Beta as expected from me.

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

Name: YASH VIJAY(2017A7PS0072P)

Student write-up

Short summary of work done during PS-II: I worked on two projects. The first one involved making changes to an internal tool and the second one involved integrating with a partner company. Both of them were back-end projects in java.

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

Objectives of the project: To improve the tool for internal employees for project one, and to integrate with an external partner for the second project.

Major learning outcomes: Java, Back-end development, GIT.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: The team as well as the manager was pretty supportive. The first project was relatively unclear in terms of deliverables so I faced issues with it. The tech stack, the impact of work and the complexity were all as per my expectations.

Academic courses relevant to the project: OOP, DSA.

Name: ADITYA UPADHYAY(2017A7PS0083P)

Student write-up

Short summary of work done during PS-II: I worked on two projects. The first project is for service migration. Our team has tool whose one of dependency is deprecating. I was assigned to investigate on the solution and implement the new changes. I contacted with various teams for this purpose and was able to complete this migration. My second project, includes adding new features for improving the development experience and also to investigate the methods to automate the task to upload docker images to ECR repository.

Tool used (Development tools - H/w, S/w): AWS Lambda, AWS Codebuild, AWS Codecommit, AWS Codepipeline, Amazon EMR, Amazon ECR, Docker etc.

Objectives of the project: To complete the migration successfully without any customer service outage. And for second project, to complete the task assigned and raise CR for changes.

Major learning outcomes: I learnt about AWS codebuild, AWS codecommit, AWS lambda, Amazon ECR and Amazon EMR. Moreover, I learnt about end to end software development

practise at Amazon. I also learnt about how to implement docker inside docker and its security implications.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: I can ask for team mates for issues when I am stuck. Apart from that, the team is quite supportive and helped me lot in my onboarding. Moreover, I got lot of help from my manager, when I was stuck contacting different teams. As, the internship was completely virtual, things became a bit hectic sometime, but overall the experience was good. We had several team bonding session online, which helped me get familiar with my team. Overall, the working environment is quite positive.

Academic courses relevant to the project: OOP, Computer network, DSA, Cloud computing.

Name: ANKIT SINGHAL(2017A7PS0100H)

Student write-up

Short summary of work done during PS-II: I was part of Amazon Pay team. I worked on multiple projects, my most of the tasks were related to internal tools where I worked upon adding new features. Newly added features are already launched and merchants are benefitting after this launch. I got chance to work upon both front-end and backend.

Tool used (Development tools - H/w, S/w): Java, JavaScript, AWS SQS, AWS Lambda, AWS S3, AWS DynamoDB, AWS Redshift, AWS Kinesis.

Objectives of the project: Main objective of the project was to enhance the experience of Amazon pay tools.

Major learning outcomes: 1. A product should be looked at from a holistic point of view rather than just looking at happy case scenarios. It should always be developed through backward

engineering first understanding customer requirements and gathering all important information before starting the development.

2. I learnt how to prioritise the tasks. Got to work on multiple things at a time which helped me learn time management.

3. I got an opportunity to learn new technologies, different AWS components like SQS, DynamoDB, Kinesis, Lambda function, Redshift Clusters, design patterns, dependency injection and best coding practices.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The environment is great, they give good amount of responsibility and freedom to interns. All team members were friendly and helpful. The organisation requires you to work independently, there would be mentor and peers to guide but it is expected that you are able to work and solve problems on your own. Interns at Amazon get ample amount of learning opportunities which definitely helps a lot to grow as SDE.

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

Name: KOMAL VASUDEVA(2017A7PS0103P)

Student write-up

Short summary of work done during PS-II: I joined Amazon as SDE Intern on 25th January, 2021 in JP-PAE Department of consumer payments team. In the first couple of weeks, I got familiar with Amazon workspace, attended SDE Bootcamp, went through the Payments ramp-up, dived deep more about my team, ongoing projects and learnt about some of the basic terms like Version Sets, Purchase, Orders, Shipments which are most frequently used by my team and went through majority of the tools like Brazil, Apollo, Weblab which my team uses. I also learnt about the CR Review Process, MCM Bar raiser process, and dive-deeped into the monitorportal to learn about how different metrics and alarms are used for determining the state

of production. My team works for JP payments services and I understood the responsibilities and expectations from my side. I worked on handling and enhancing the notification platform, set up with an aim to increase order completion and decrease order drop rates. I worked on a library integration, and on making enhancements and refactoring the pre-existing code in order to make the platform more robust and efficient.

Tool used (Development tools - H/w, S/w): Tools Used - Java, IntelliJ, Brazil, Apollo, Crux Reviewer, Weblab, GIT.

Objectives of the project: The project had a list of subtasks: 1. Library integration for getting profile details. 2. Code refactoring and optimization. 3. Deep-diving about the system and solving pre-existing problems. 4 . Coming up with a plan to retrieve and include the error code in the final notification sent.

Major learning outcomes: 1. A product should be looked at from a holistic point of view rather than just looking at happy case scenarios.
2. I learnt how to prioritise the tasks. Got to work on multiple things at a time which helped me learn time management.
3. I got an opportunity to learn new technologies, different AWS components like SQS, DynamoDB, Kinesis, Lambda function, Redshift Clusters, design patterns, dependency injection and best coding practices.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: 1. Working Environment: The environment was good. I had a manager and a mentor, and had meetings with him twice a week. We had a daily stand-up, where we had to give updates about the previous day's work, and share our plan for the day. We also had a fun session every week, for team-bonding. Occasional talks and meetings were held by the senior management.

Expectations from the company: This depends on your team. Some teams were hectic, but my team was relatively relaxed. There weren't long working hours and the timings were flexible.

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

Name: RAJHANS ROHIT MILIND(2017A7PS0105P)

Student write-up

Short summary of work done during PS-II: Amazon has introduced a line of physical stores in various global markets. I worked in a team that handles the post-order customer experience for these physical stores. The team primarily worked on handling the offline and online custom returns experience for physical store orders. My project was centred around improving the customer experience for non-Amazon customer returns. I worked on designing and developing a service that could retrieve customer order details through customer's order description and payment methods in case the customers lose their receipts.

Tool used (Development tools - H/w, S/w): AWS Tools - AWS Lambda, DynamoDB, SQS, SNS, VPC, CloudWatch etc.

Languages - Java, TypeScript

Other internal Amazon development tools

Objectives of the project: Non-amazon customers were facing issues in returning items due to identification problems. The project revolved around resolving this issue and facilitating returns for these customers. The larger part of the project focused on developing a generic order listener service that would publish order details to multiple clients and clients can easily onboard to it in order to satisfy their data requirements. The architecture was designed in a way to easily extend it to store other order or returns details as an when the need arises.

Major learning outcomes: The project gave me an exposure to the design process of a new service and how important it is to have a long term outlook while coming up with the architecture. Got to learn a lot about the practices to follow while writing production-ready code

through the code review process. Learnt about several AWS services while making design choices such as AWS EC2, ECS, Lambda, different databases etc.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Amazon has an amazing work culture that promotes a healthy professional growth. The company puts a strong emphasis on its leadership principles and evaluates employees w.r.t. those. Interns are assigned projects that matter to the team and the expectations from them are no less than a full-time employee. The work-life balance is fine with occasional long hours. This may be team dependent but seniors in the team are easily approachable in case one has any doubts. Overall, it was a great experience.

Academic courses relevant to the project: Object-Oriented Programming, Database Management.

Name: BHAVYA AKHIL SARAF(2017A7PS0110G)

Student write-up

Short summary of work done during PS-II: The work involved a variety of projects. I was a part of Amazon Pay TPM/CX team which owns and maintains a series of services responsible for functionality of Amazon Pay in North America and Europe. Projects assigned during the internship involved from consumer facing UI improvements, removing dependencies of deprecated and security critical packages from a service, coming up with a design to transfer incoming mails to a domain to ACP service (Internal Amazon Service used to send anonymous mails to the clients) and creating new API's for new products. The primary programming languages used were Java and Ruby Rails. The work also exposed me to a wide array of AWS Services like Simple Notification Service (SNS), SQS Queues, SES Service etc. Exhaustive coding opportunities were accompanied with the exposure to practices prevalent in professional Software Development, using git and practice of submitting code reviews. The work also

involved cross team communications to teams from Cupertino, NA and Japan. The names and other details of these services cannot be disclosed outside Amazon for security purposes.

Tool used (Development tools - H/w, S/w): A wide variety of software and hardware technologies were used. On the hardware front, interns were given with dedicated cloud servers with extensive computing capacities for testing and deployment purposes. We were supposed to access these Cloud instance

Objectives of the project: Enabling Intelligent Auth for Payments Your Account website: Enable ML backed Intelligent Auth service to authenticate customers landing on Amazon Pay website.

Major learning outcomes: Along with the knowledge of using hardware and software tools mentioned in one of the above sections, the internship also exposed me to the practice of coming up with a detailed design, documentation and class level diagrams before coming to the implementation.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The team, mentor and manager were highly responsive and supportive during the internship tenure. Daily team meetings and regular one-on-ones with managers aided not only in technical discussion but also in jocular informal communication within the team. I did not find the work to be very hectic, although initial few days might get a bit overwhelming as there is a lot learning required to grasp concepts like version sets, VFIs, apollo etc. Overall, the working environment is quite friendly and supportive.

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

Name: PRAKHAR GUPTA(2017A7PS0121H)

Student write-up

Short summary of work done during PS-II: I created the shadow traffic replay feature which will allow Amazon clients to perform testability run on their payment resources directly shaping customer onboarding experience of 3000+ business partners.

Tool used (Development tools - H/w, S/w): Java, spring, RubyOnRails, ERB, HAML, AWS, Junit, Linux.

Objectives of the project: The main objective for this project is to develop and implement a complete end-to-end workflow so that when the customer edits a resource configuration in payment UI and a new version gets generated he/she will have an option to use shadow traffic replay functionality against it.

Major learning outcomes: 1. Tools/ technologies: Spring, Unix, Ruby on Rails, DynamoDB, AWS, etc.
2. Detailed documentation creation.
3. Inter-team communications and code development processes at large scale companies.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Amazon has extremely productive working environment, our mentor and team is always there to guide us. We work on projects that directly shape customer experience. Moreover, the company expects delivery on time with detailed documentation of the same.

Academic courses relevant to the project: OOP, OS, DBMS, SE, Distributed computing.

Name: SHAH DHRUV DHARMENDRA(2017A7PS0138H)

Student write-up

Short summary of work done during PS-II: Rearchitecting of Throttling and Prioritization modules from a latency based to a client based architecture. Introduced various factors like SLA, Throughput and Priority to handle client traffics. Improved the spell checker algorithm performance using a ML based solution. Integrated an entity detection service and utilized its output to reduce the false positives flagged by the spell checker.

Tool used (Development tools - H/w, S/w): Java, Pipelines, AWS S3, DynamoDB.

Objectives of the project: Rearchitect Throttling and Prioritization modules, Improve spell checker algorithm.

Major learning outcomes: Learnt software development in Java and how to write unit, integration tests etc. Improved soft skills like team cooperation, communication.

Details of papers/patents: NA

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

Academic courses relevant to the project: DSA, OOPS.

Name: NIDHI ZARE(2017A7PS0139G)

Student write-up

Short summary of work done during PS-II: Work was around automation and scaling for peak preparation at Amazon i.e. time when more number of users go for Amazon shopping (Diwali, Prime Day etc). My work was to automate communication and promotion across teams for peak preparation which currently is manual.

Tool used (Development tools - H/w, S/w): Primarily used AWS(Amazon Web Services) and associated services like Amazon simple e-mail services, Dynamo database, simple queue services etc.

Coding - NodeJS framework.

Objectives of the project: To reduce effort spent by software developers and managers in peak preparation by automating activities like hardware ordering, communication etc.

Major learning outcomes: How scaling activities are done and managed in the company, low level and high level designing, documentation and soft skills are - working in a collaborative environment and expressing ideas.

Details of papers/patents: No papers/patents, the work was on development of a product.

Brief description of working environment, expectations from the company: The culture at Amazon as well in my team is great. Everyone's ideas are respected in the team even the interns. Good collaborative culture, mentorship and a culture that promotes new ideas and innovation. Overall great opportunities to learn and contribute.

Academic courses relevant to the project: Object Oriented Programming (OOP) for designing part of the project.

Name: DEEPAK CHAHAR(2017A7PS0147P)

Student write-up

Short summary of work done during PS-II: Designed a new proof of concept for a service to automate and ease Operations team's work.

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

Objectives of the project: Designed a new proof of concept for a service to automate and ease operations team's work.

Major learning outcomes: AWS - Service oriented architecture, OOP design patterns, JavaScript-Python full-stack development.

Details of papers/patents: Paper mentioned the problem statement, and potential benefits that this service will provide to the Ops team. It also explained some difficulties and other approaches tried and why those approach failed.

Brief description of working environment, expectations from the company: Amount of work is above average, but it can be done because of helpful and supportive team.

Academic courses relevant to the project: OOP, DSA, DAA, Information retrieval.

Name: SUNE ATHARVA PRAKASH(2017A7PS0183H)

Student write-up

Short summary of work done during PS-II: Implemented changes in Amazon search engine's semantic search feature, that would make it more efficient and improve its performance. The changes potentially impact direct consumer experience with faster results for anything that is searched on amazon's websites. Also developed internal tools, to automate some of the tasks, parse their results and print them in a format that is easy to share and understand, the scripts are being used by various other team members as well.

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

Objectives of the project: Implement optimizations in the codebase, analyse the effects of implementing them, compile all results.

Major learning outcomes: Build systems, Design planning, Multithreading, Importance of documentation.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The work environment can get a bit hectic, but if you get the right team, and you like the work, there is a lot to learn, and you will enjoy it a lot. The team members, managers and principal engineers are all very helpful, and will answer the most basic of your queries. In addition, you are free to contact anyone related to your project, breaking the traditional hierarchical barriers that exist.

Academic courses relevant to the project: OOP, Information retrieval, Machine learning, DSA.

Name: SHRISH TRIPATHI(2017A7PS0188H)

Student write-up

Short summary of work done during PS-II: The internship consisted of numerous projects. For the first project, objective was to understand how to make the front-end and back-end changes. This included going through the reading material and understanding any concept, technology, etc. that will be used in the scenario. For the second project, the objective was to improve the partner onboarding process. For the final project, objective was to remove the discrepancy that was presented between the report that was used by the BuyBack partners and the data warehouse that was used by the programs team.

Tool used (Development tools - H/w, S/w): Git, IntelliJ, CLI, Quip, DynamoDB.

Objectives of the project: This project explores some of the possible ways to remove the errors that are because of following manual and outdated SOP. Often, the key steps are missing and if present, generally are not in the correct order. Apart from that some essential checks are

not present. Automation has been sought as the solution approach because of the performance improvement in terms of speed, robustness and efficiency.

Major learning outcomes: Spring MVC framework, Front-End and Back-End development, API creation.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: The development work was mostly in Java, using the Spring MVC framework. The expectations were clearly set out and explained, so that everyone is on the same page. It was expected to understand the problem statement clearly, deep dive to come up with the solution approaches complying with the business requirement and then implement that using best practices and team guidelines. It was also understood that any changes would thoroughly dev-tested and covered properly with unit tests.

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

Name: AYUSH GARG(2017A7PS0193P)

Student write-up

Short summary of work done during PS-II: Worked on building a refund tool for use by internal members and also worked on the components of Amazon pay notification system.

Tool used (Development tools - H/w, S/w): HTML, JavaScript, Java, IntelliJ, AWS tools like SQS,SNS, S3, Lambda etc.

Objectives of the project: Build a tool for refund workflow of Gift Card payment method.

Major learning outcomes: How the corporate culture works.

Learnt about Amazon code production architecture.

Ability to deal with Ambiguity.

Work independently, Work on varied set of tools and applications, building scalable and secure application.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is good and interns are treated at par with the employees. Organisational structure is pretty flat and everyone is approachable. New ideas are encouraged and thoroughly discussed. One can learn a lot during the internship about professional life in general.

Academic courses relevant to the project: Object oriented programming, Data structures.

Name: JHAVERI AYUSH RAJESH(2017A7PS0215P)

Student write-up

Short summary of work done during PS-II: My team was the physical stores automation team. I was involved in the development of new automation portals for physical stores, e.g. Amazon GO. My work was primarily in backend website development using AWS. I designed and developed APIs and client packages. Lot deep dive had to be done around virtual private clouds and digital signatures.

Tasks:

1. Addition of store ID, device type and device ID search filters to the recently launched device provisioning automation portal.
2. Creation of a Merchant Regions Manager (MRM) client for the RetInA portal v1 release.
3. Creation of GetStatus APIs for the RetInA portal v1 release.
4. Creation of Alarms and Metrics for the RetInA portal v1 release.
5. Retrieval of AWS credentials from Odin for RetInA device provisioning.

Tool used (Development tools - H/w, S/w): AWS Lambda, AWS cloud development Kit, Amazon DynamoDB, Java, TypeScript, Git.

Objectives of the project: Contribute to the development of the retail integration automation portal and device provisioning automations portal.

Major learning outcomes: AWS technologies, REST APIs, Digital signatures, Virtual private clouds, Work and coding culture.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Although work from home, it was a great work environment. My team was developing new automation portals, and I was involved in the planning and backend designs of these portals. My mentor would respond quickly and push me to figure things out - there are many amazon resources to find out solutions. My manager was very transparent with everything - gave reasonable feedbacks, let me take charge of several team activities and was always transparent with the team needs and the placement conversion process.

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

Name: SARTHAK GAUR(2017A7PS0250H)

Student write-up

Short summary of work done during PS-II: Completed two projects. First was developing a debugger tool using AngularJS for front-end and NodeJS for backend with DynamoDB as database to help with on-call tasks. In second half, I was assigned ownership for data aggregation for a business critical project where my role was to develop portal, process & store data in database, create lambda for data manipulations and similar database manipulation tasks.

Tool used (Development tools - H/w, S/w): Java, AngularJS, NodeJS, AWS services(Lambda, S3, SWF, Cloudformation, DynamoDB, Redshift).

Objectives of the project: Develop a debugger tool and complete data aggregation tasks for forward deployment project.

Major learning outcomes: Learnt new languages (Nodejs, angularjs), writing Junit tests for Java, understood business workflow, logics improved upon coding practices and new techniques for developer testing.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment was very nice. Every colleague helps in one way or another and very healthy discussions full of productivity happen which helps in progress and feedback mechanism also helps to grow.

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

Name: SREYAS RAVICHANDRAN(2017A7PS0275P)

Student write-up

Short summary of work done during PS-II: Developed a tool for automotive data ingestion called APDP fetching about 26 million products. This data was then used to feed an ensemble to predict business metrics like profitability, product selection, offers etc.

Tool used (Development tools - H/w, S/w): Mason, Perl, Java(libraries), AWS services and amazon internal tools.

Objectives of the project: Ingest automotive data to service ML pipelines for business teams.

Major learning outcomes: Understanding robotic attacks, Multistage and multilevel product stack, Big data processing, Design principles.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: - Working environment was warm and approachable. Despite being WFH, additional support and training was given. Flexible daily schedules.

- Expectations from the company was to deliver projects as per timeline, reciprocating the culture maintained and engage in productive activities beyond one's project.

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

Name: SATYAM MANI(2017A7PS0277H)

Student write-up

Short summary of work done during PS-II: My work was on writing a AWS lambda package for facilitating the sync up between dynamo db tables used by other services to data in elastic search. I wrote a package using Java which listened to events from dynamo db and also did scan for old data items. After processing the data into form required by the API gateway of elastic search.

Tool used (Development tools - H/w, S/w): 1. AWS technologies such as lambda, SQS, S3 bucket, API Gateway and elastic search.
2. Language used - JAVA and Python, Streaming SQL (used for testing proof of concept).

Objectives of the project: Listen to dynamodb events, scan the dynamo db table and write a AWS lambda function that would handle all this and after processing dump the data onto elastic search.

- Major learning outcomes:**
1. Strong grasp of low level design
 2. Software development life cycle
 3. Good ramp up on AWS technologies
 4. Writing production code and testing with Unit tests and integration tests
 5. Subtle things that are required while coding but not done in college (Eg - dependency injection while writing classes)

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment and expectations varies from team to team. In my team people were really helping and could be reached out at any time if you encountered errors or needed support. In my team they expected me to complete the assigned task before the deadline and carry out the tasks independently, right from designing to deployment in production, team members are ready to help whenever required but it is expected that task are carried out independently.

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

Name: VIPIN BASWAN(2017A7PS0429P)

Student write-up

Short summary of work done during PS-II: Worked on three projects with gradually increasing difficulty and impact.

Tool used (Development tools - H/w, S/w): AWS StepFunctions, DynamoDB, AWS Lambda, Java, Python.

Objectives of the project: 1) 1st project was based on creating new reusable service using REST API principles and minor changes to UI. 2) Second project was based on system optimisation. 3) Third project was implementing new feature for some already existing project.

Major learning outcomes: 1) Software development practices 2) Learning about dev in Java using AWS 3) Working with team.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I had very good experience at Amazon, both work and otherwise. People are very supportive, this makes it easier to onboard and learn stuff during onboarding. Interns are expected to ramp-up and deliver their projects/milestones on time (this is crucial for full time conversion).

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

Name: NAHUSH HARIHAR KUMTA(2017A7PS0930G)

Student write-up

Short summary of work done during PS-II: Following were the things I worked on:

1. Adding support for BatchGetItem and TransactGetItems DynamoDB (DDB) APIs in a live migration software.
2. Adding monitor creation support for DynamoDB-DynamoDB migrations.
3. Adding validation code to ensure only valid operations are getting executed given a step.

Tool used (Development tools - H/w, S/w): DynamoDB, NoSQL Databases, Java.

Objectives of the project: The following were the objectives of the project: 1. Add support for BatchGetItem and TransactGetItems DynamoDB (DDB) APIs in a live migration software. 2. Add monitor creation support for DynamoDB-DynamoDB migrations. 3. Add validation code to ensure only valid operations are getting executed given a step.

Major learning outcomes: I learnt about NoSQL databases (mainly DynamoDB) and their differences as compared to SQL databases. I got support for some DynamoDB APIs in the product I was working on. Moreover, I also learnt the importance of monitoring, testing and trying to build fail-safe systems that do not perform any invalid operations. Overall, the work showed me the importance of following good coding practices and writing clean, reusable and readable code. This is very important especially in a team environment wherein, if someone else wants to add a feature on top of your code then he can easily do so since your code is written in a manner which is easy to understand.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment at Amazon was very fulfilling. We got a decent amount of work and enough help to complete the tasks. Amazon also values its leadership principles which it expects you to portray in work which indirectly improves your performance.

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

Name: RIJUL GANGULY(2017A7PS0971G)

Student write-up

Short summary of work done during PS-II: The EasyShip service has a lot of interconnecting parts which need to be working in order to enable it for a particular marketplace. Foremost among these are the EasyShipPanjeekaranService and the EasyShipESOFSService. My project involved onboarding these two services to the NA and FE realm.

The EasyShipPanjeeekaran is the service which handles all registrations and subscriptions for merchants at the EasyShip settings page. It is therefore the first service which needs to be activated for the other realms in order to bring the EasyShip services to these countries.

The EasyShipESOFS service handles the delivery and restricts HAZMAT (hazardous materials) from being transported depending on the specific marketplace. Different marketplaces have different HTSC-HE combinations which determine whether a specific HAZMAT item can be transported through EasyShip for that particular marketplace. Therefore the ESOFS service also has to be onboarded to the realms in order to facilitate EasyShip there.

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

Objectives of the project: International expansion of EasyShip services to NA and FE realms.

Major learning outcomes: How to build and maintain a service, modifying a service to meet expectations of different teams.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I expected Amazon to be a great experience for advancing my knowledge of how services interact and work with each other, and I was not disappointed by what I experienced. The working environment was friendly, and everyone in my team and project was willing to guide me.

Academic courses relevant to the project: OOP, DBMS, Data Structures and Algorithms.

Name: SHIKHAR TAYAL(2017A7PS1392H)

Student write-up

Short summary of work done during PS-II: First project included:

- Sample data collection: This included querying the historical data to create a sample data set to identify locations that were used to schedule campaigns.
 - Filtering and parsing the data set: This included writing a Python script to parse and filter the collected raw data which will be populated in the table.
 - Writing the APIs to access the table data: This included writing REST APIs to expose the data to the frontend.
 - Creating a component list showing different restrictions: This included collecting and creating a consolidated list of different components that can be used to render content on different pages
- Second project included:
- Sending data: Metrics data from FCR Client should be sent continuously and in real-time. To achieve this, I created a telemetry application which is a multi-threaded application that listens to metric data from FCR client and parallelly send that data through WebSocket to the cloud.
 - Processing and storing data: Data received from FCR client needs to be processed and stored in an organized and effective way. Used AWS cloud for this. Cloud infrastructure code was written using aws cdk which is based on the principle of Infrastructure as code.
 - Visualization of data: We needed to create a real time visualization platform that gets updated quickly and efficiently. Grafana was used for this. It allows to create dashboards with multiple visualization where end users can view, query, visualize and get alerts on to understand the data which is stored in a time-series database.

Tool used (Development tools - H/w, S/w): Python, Flask, NodeJS, Typescript, Java, AWS cloud, AWS CDK, TimeStreamDB, Grafana, WebSocket, IntelliJ, Git.

Objectives of the project: First project explores some of the possible ways in which we can encode the decision processing required to ease the marketer's job i.e. identifying the best locations for scheduling a creative and preparing the creatives to be render able on the identified locations. Second project aims at creating an end to end pipeline for sending, storing and visualizing FCR subscriber data and presenting it to publisher.

Major learning outcomes: This internship has been a tremendous learning experience for me. I used different languages and framework at different times. This includes Python, Flask, NodeJS, Typescript, Java. I also got first-hand experience in using AWS cloud and used various AWS services including Lambda, DynamoDB, TimeStreamDB, IAM, Secret Manager, API Gateway etc. I used AWS CDK which simplifies the task of a developer to create and manage

the cloud infrastructure. I learnt and used many other concepts and technologies like WebSocket, Grafana, multithreading and various Amazon internal tools. Apart from all the technical learning, I have improved my soft skills also which are as important as any technical skills. I learnt how to professionally interact with the industry people and when to ask for help.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Amazon is an American MNC whose headquarters is located in Seattle, Washington. Amazon has many businesses, out of which main business are core e-commerce operations, cloud services, digital streaming and artificial intelligence. At amazon, we are constantly building products that eventually leads to improving the overall shopping experience of amazon customers. Every day when we work on designing and building a service that will directly or indirectly make lives of thousands and millions of users better is really exciting and challenging. This challenging work also allows us to grow our self professionally. We are learning something new every day whether its technical and nontechnical. People in the company will help and guide us throughout your internship.

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

Name: SHAH VISHAKH RAKESH(2017A7PS1445H)

Student write-up

Short summary of work done during PS-II: I did my PS-2 with the Prime Video International Expansions - Payments team at Amazon Development Centre, Bangalore. My team is responsible for developing payments related infrastructure whenever Prime Video launches in a new country. For the first half of my internship, I worked on integrating various Prime Video services with an internal testing framework. This framework would help automate the testing process and help save resources for all subsequent Prime Video launches. For my second

project, I worked towards the development of the QA automation framework, for automating test data generation while executing QA use-cases.

Tool used (Development tools - H/w, S/w): JAVA, IntelliJ IDEA, various Amazon internal tools and services.

Objectives of the project: The major objective of both my projects was to contribute towards the automation initiative that my team has undertaken in collaboration with other teams within the Prime Video org.

Major learning outcomes: Understanding Prime Video's architecture significantly improved my system design skills. Coding practices followed here have definitely improved my coding skills up to industry standards. Daily interactions with colleagues from my team as well as other teams have improved my soft-skills which will go a long way towards my professional development. At Amazon, we gained a real understanding of how systems work at scale.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Amazon has a dynamic, fast paced working environment with emphasis on ownership and delivering results. We have given complete responsibility over the project. This means that you are responsible for everything right from analysis, design, implementation and co-ordinating with all stake-holders to deliver results as per the deadline. That being said, help is always available at amazon and colleagues from your team as well as other teams are easily approachable.

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

Name: ANUSHRAY MATHUR(2017A7PS1570H)

Student write-up

Short summary of work done during PS-II: At first an SDE bootcamp was to be attended to get familiarized with the tools used by the team. After which few rampup tasks were given which included deprecating/cleaning up a service which was no longer needed and to write a function to convert base64 encoded string into ByteArray. All coding was done in Java. The major task which I did was to create a new service which acted as an eligibility service for the product being developed by the team. This service was created from scratch and deployed into production.

Tool used (Development tools - H/w, S/w): Git, AWS Lambda, AWS S3, IntelliJ.

Objectives of the project: The objectives of the minor tasks was to get familiarized with workings of the team and to understand the software development cycle. The objective for the major task was to create an eligibility service which would "black-list" certain users who were not supposeed to use the product the team was developing.

Major learning outcomes: My work and contribution in the project has provided me with a lot of experience. I've understood the inner workings of a big company such as Amazon and the whole software development cycle in general.I've learnt new software and experienced working in a scrum cycle where each sprint is planned in advance with deliverables to be met.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The complete mode of internship was work from home. The company provided a laptop, headphones, keyboard, mouse to setup home workspace. The working hours were quite flexible and relaxed. A daily standup meet was held in the team to inform what work was done on the previous day and what is to be done today. A bi-weekly sprint planning meet was also scheduled to decide what all work is to be done by everyone for the next couple of weeks and how many days of effort is required for each task. It was expected that the timeline decided in the sprint plannings be followed if no blockers arise.

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

Name: GUNPREET KAUR(2017A7PS1573H)

Student write-up

Short summary of work done during PS-II:

1. Complete Backend API
Complete the existing variable latency profile API, which would fetch various metrics like latency, error rate, default rate, downstream dependencies for the variables.

2. Caching design and implementation to reduce time of retrieval of the information

Implementation of Cache populator that will periodically fetch variables' metric data and refresh cache.

3. Design and implementation of Variable Latency planner UI and integration with intent edit/create flow. The UI Platform needs to be developed, to display the variables information the onboarding client, so as to facilitate the variables' selection by giving a better user experience.

Tool used (Development tools - H/w, S/w): Java, IntelliJ IDE, React, Redux, JUnit, Jest.

Objectives of the project: An Intent represents a business specific risk evaluation configuration. FORTRESS serves as a risk evaluation engine. It is based upon the concept of GMRA (Gather-Model-Rule-Action) model. It uses the TRMSEvaluationConfigurationService (TEC) as configuration management service and gets the evaluation configuration required for evaluation. Currently, while configuring an intent, our customers set a gather budget for variables at each stage. These gather budgets are allocated based on business needs and it is different for each use case. The problem is that while configuring intent, customers don't have a way to gauge whether the variable gather latency is within the defined gather budget. This is discovered only after the intent is deployed in shadow or in some cases production. Below is the limitation that is needed to be addressed: Variables' performance is a blackbox to scientists like variable computation latency, error rate, default rate, downstream dependencies. Hence, scope of project is in developing portal giving this meaningful information.

Major learning outcomes: 1. Upgradation of tech-stack 2. Exposure to working and collaborating in the corporate world.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Amazon's working environment's pivot is their 14 leadership principles. There are 14 fundamental leadership principles which every Amazonian abides by. They describe how Amazon does business, how leaders lead, and how they keep the customer at the center of their decisions. It is expected to work catering to all of these principles targeting customers' best experience at every step.

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

Name: HRISHIKESH A J(2017A7PS1740H)

Student write-up

Short summary of work done during PS-II: I was allotted a team in the Amazon Go organization. My project was to automate the tasks that is performed every time a trouble ticket is cut for our team. The current process followed by the oncalls is painful and time-taking. To develop this tool, we used Python and Jupyter Notebooks.

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

Objectives of the project: Create a one-stop tooling solution for debugging and mitigating issues.

Major learning outcomes: Mostly working with internal Amazon tools and the executive decision-making process behind a software development project.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: This is highly dependent on the specific team (and hence, manager) you are allotted. In my case, the working environment was highly supportive and encouraging.

Academic courses relevant to the project: DSA, OOP.

Name: VISHNU Y S(2019H1120049P)

Student write-up

Short summary of work done during PS-II: The address and the profiles in stored in Amazon are maintained and upgraded with new features regularly. This project contains feature addition of both, address management system and the profile management system. The address management system has been upgraded with a new feature for developers to test their JS changes in minutes without having to deploy their code which takes half a day to one day. The profile management system's newest feature is PIN protection. This feature enables users to add PIN authentication system to ensure no unwarranted visits occur from other profile owners to protect their sensitive data from being misused.

Tool used (Development tools - H/w, S/w): JavaScript, Java, Git, IntelliJ, Sublime Text, Mozilla Firefox, Google Chrome, iTerm2.

Internal Tools - Apollo, Brazil, CRUX, Code Browser, Pipelines, Builderhub, Black Caiman.

Objectives of the project: To assist AJAX call testing of developers without the need for deployment and adding PIN verification mechanism to profiles.

Major learning outcomes: Java, Scala, Unit Tests, Low Level designing of project, Class diagrams, Documentation.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment - WFH through VPN. SSH into cloud desktop and sync code from local system to cloud while developing. Build and deploy the project in Cloud system and test the changes using debugging tool. Git for source control and CRUX for code review. Pipelines for project deployment into production.

Expectations: Follow leadership principles. Incorporate them in daily life. Build products of highest standard and deliver results on time.

Academic courses relevant to the project: Object Oriented Analysis and Design, Software Architecture, Software Testing.

PS-II Station:Amazon Development Center, Hyderabad

Faculty

Name: Prof. T.V. Rao

Student

Name: RONAK BHATTAD(2017A3PS0200P)

Student write-up

Short summary of work done during PS-II: My goal essentially is to develop a user interface for the auto case creation tool so that the FinOps teams can directly use the interface instead of interacting with the tool through AWS console. I first had to establish the tenets and choose the most compatible frontend framework accordingly. Then, setup the pipeline and packages required for the purpose of hosting the UI and setup the necessary AWS infrastructure for communication between the frontend and the backend where the tool resides. Finally, complete all the tasks lining up to the prod push with end-to-end testing in a CI/CD form and hence deliver the product to business. I started by performing a deep dive to learn the project's requirements and establish a set of tenets. Following which, I finished up my ramp up tasks and performed

deep dive on the technologies involved and began working on a delivery plan for the project. Then, I documented the appropriate frameworks and compared them. After organizing a team review, I applied the given feedback and choose Katal framework for the UI. Moving to the next phase, I performed a deep dive into Katal and AWS CDK. Once confident enough, I created the required packages and pipeline for hosting the UI in AWS CloudFront. I extended the pipeline until the prod stage simultaneously working on the actual UI. I raised CR with 96% unit testing coverage and presented a demo for the same to the team. As for the AWS integration, I again performed a deep dive and documented all the suitable approaches and organized a team review. Based off of team feedback and factors such as security and ease of integration, I choose the most suitable approach and implemented it. The next major goal was beta stage, therefore I started with the most important tasks required for beta testing including setting up a Nova domain and added custom CloudFront template with CR, migrated the cloud infrastructure to CDK package with CR, integration testing of UI with CR, making changes to backend for API requests with CR, then I performed manual beta testing and the PVT in prod is ongoing.

Tool used (Development tools - H/w, S/w): I have definitely improved my skills in the domain of code quality, version control, languages and document writing. All of these are apparent from the code reviews I have raised over time. I have also added a whole new set of skills to my profile.

Objectives of the project: To deliver a fully NAWS architecture based and secured web application to the finance operations team for raising vendor compliance requests.

Major learning outcomes: Architecture design, delivery planning, working in a team.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Amazon is huge, generalising the whole company after a five month internship won't be logical. The team I have been a part of, on the other hand is really good. Everyone is available for help, all you need to do is ask.

Academic courses relevant to the project: Computer Programming.

Name: PRATEEK AGARWAL(2017A7PS0075H)

Student write-up

Short summary of work done during PS-II: Worked on multiple tasks dealing with different services that our team owns throughout the PS-2:

- Worked on an internal CLI tool used by our team for testing APIs - Fixed bugs in the tool and implemented a new enhanced flow.
- Added new metrics and alarms in AWS CloudWatch of one service to help detect exceptions during the execution of API and take necessary action in case of a bug.
- Added unit test suite to a package which also helped detecting a bug in existing code and fixed that.
- Refactored projects to use Dependency Injection Design pattern which helped improve code structure and make it less error prone.
- Designed and implemented a new flow in an existing AWS step function handle retryable type of exceptions in case they occur during the execution of any step. These errors were previously being thrown and required a manual attempt to run it again, but after enabling automatic retries of such exceptions, manual retry was not required.
- Setup a new pipeline to host new service of our team, worked on setting up the new service from scratch and successfully deployed into production.

Tool used (Development tools - H/w, S/w): AWS Lambda, AWS ECS, AWS SQS, AWS CloudWatch, Java, Kotlin, Typescript, IntelliJ.

Objectives of the project: The project was not limited by a single goal, rather my work during the PS-2 revolved around various short term goals. The objectives were to work on services owned by the team, add new features to the service as required by clients, fixing bugs and monitor the health of the running services.

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, PostgreSQL, Dynamo DB).

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The internship was work from home. Team members were ready to help and unblock me in case I was stuck. Secondly the goal for each task used to be well scoped and defined along with deadlines. The deadlines are achievable provided you work consistently. Team practices such as daily stand ups, sprint planning and grooming sessions used to help a lot in planning the tasks properly and achieving those on time.

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

Name: SAUJAS ADARKAR(2017A7PS0109P)

Student write-up

Short summary of work done during PS-II: I was assigned a total of 3 major projects during the course of my internship. The first was related to automation of alarms related to my team's service. The existing process of manually creating and updating alarms is not scalable and is tedious to do for large sets of alarms. I automated this using Live Pipeline Templates, a tool used to programmatically create pipeline, Apollo stages, alarms and dashboards. For my second project, I had to accommodate a list of holidays within the exception dates attribute within customer delivery profile. The previous functionality allowed customers to opt out of delivery on federal holidays each of which could be associated with only one date. I extended this to include a list of holidays, such as in Diwali or Eid. For my final project, I had to include a locker accessibility option as an additional address attribute. In certain specific locations in the US, lockers had been introduced so that packages could be safely delivered when a customer was not at home. I had to include an option for the customer to opt for delivery to a lower locker

slot. This feature will be helpful for differently abled people to collect their parcels. I also worked on a few minor projects such as introducing a latency metric for the current location feature owned by my team, and fixing an out of date version set with the correct package dependencies.

Tool used (Development tools - H/w, S/w): Java, Junit, JavaScript, AUI test framework, Live Pipeline Templates, Ruby.

Objectives of the project: 1. Automate alarms for my team's service using Ruby. 2. Accommodate a list of holidays within the exception dates address attribute. 3. Introduce an accessibility feature within the existing customer delivery profile, for locker delivery to opt for a lower slot.

Major learning outcomes: I learnt about the importance of having metrics to monitor the health of a service, so that the team is appropriately notified in time and they can prevent a major service failure. I studied about various metrics such as availability, latency, host class metrics etc, while implementing the automated alarms for them. I got a good understanding of Spring MVC in Java and the Junit test framework. I learnt in detail about different JavaScript functionality, and also refreshed my knowledge of Git. I gained an understanding of the entire development-testing cycle and different pipeline stages that code moves through before being deployed to production.

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: Object Oriented Programming, Operating Systems

Name: SHUBHAM AGARWAL(2017A7PS0126G)

Student write-up

Short summary of work done during PS-II: I was a part of the transportation financial systems team. I developed and proposed the design of a UI that would serve as a place where stakeholders could view/edit configuration for existing carriers or could launch new carriers. The UI was built using React and had extensive use of React Hooks instead of the traditional state. The project involved coming up with design documents for every aspect and have discussions on it before actually implementing it. Deployment of the UI involved many AWS resources like S3, Lambda, API Gateway, Route53, CloudFront etc. The UI had to be build in Native AWS (nAWS) and had to be integrated with a backend service which was not present in nAWS which caused various problems. Multiple API Calls were required to be made for user interaction. Finally the UI was to be served using a domain, which was created using SuperNova.

Tool used (Development tools - H/w, S/w): Typescript, HTML, React, CSS, CDK.

AWS services - CloudFront, Cloudformation, S3, Route53, Cognito, IAM, Lamda, API Gateway.

Objectives of the project: Create a UI entirely on Native AWS & implement all the existing functionalities in TIPS 1.0 UI.

Major learning outcomes: Proficiency in web development, by building a UI from scratch I learnt a lot and have gained confidence in this area. Since the UI was to build on Native AWS, I got a chance to understand and work with various AWS resources. Multiple code reviews from senior employees have improved my code standards.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: While developing projects internally 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 and knowledge gap and this requires some effort to understand. Apart from this, the culture is pretty friendly, one can always communicate to their manager regarding any problem. Amazon does expect their employees to deliver results and hence they stress a lot on maintaining deadlines and plans which results in a structured execution. Amazon also stresses on documentation and you are expected to maintain SIMS/Docs for almost everything you do.

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

Name: KESHAV SHARMA(2017A7PS0140P)

Student write-up

Short summary of work done during PS-II: Onboarded to G2S2 storage system to register plugins for various resolutions, resolved risks to remove critical user information from logging and mitigating policy risks, involved in the Tier-1 readiness of team by improving availability of various APIs and decreasing latencies, involved in analysis and migration of services, unit and integration testing of APIs and classes.

Tool used (Development tools - H/w, S/w): Java, Spring, Monitors, RDS, SQS, PostgreSQL, Junit.

Testing: AWS Host

Objectives of the project: 1. Optimization and Monitoring of Concessions APIs 2. Migration of services to newer code bases and analysis 3. Setup stages in pipeline and onboard to storage service to register plugins.

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. 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. Learnt about testing processes of APIs involving various use-cases.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work environment is largely team dependent.. I learnt a lot from the experience and the work drove me to understand in depth about each concept. There were times when the work did get a bit hectic (especially considering we were working from home), but the team members are always ready to help you out. Overall it was an amazing experience.

Academic courses relevant to the project: Object Oriented programming, Data Structures and Algorithms, Computer Networks, Operating Systems, Software Testing.

Name: DAKSH YASHLAHA(2017A7PS0218H)

Student write-up

Short summary of work done during PS-II: The project involved development of the deployment manager service, a subpart of the EDAMS project. EDAMS is responsible for various services related to devices present in fulfillment centres across the globe. These services can be provisioning, managing deployments, monitoring, health-check etc. Edams make it easier to deploy lambdas to end devices and manage and monitor these deployments in a seamless manner. The deployment manager part involves development of various backend APIs for implementing this service which includes APIs to start deployment, handle failures, get current deployment status and information, perform single-device and group deployments etc. It also involves handling the permissions and security as this shall only be used inside Amazon

Fulfillment Centres. Another objective is development of a WebUI portal, so that customers can easily use this to view and manage deployments without having to contact the edams team for various tasks and information.

Tool used (Development tools - H/w, S/w): Amazon Web Services, AWS Lambda, AWS API-Gateway, AWS DynamoDB, AWS IoT, AWS Greengrass, AWS Cloud Development Kit, React Framework, Smithy, GraphQL APIs.

Objectives of the project: Development of deployment manager, a part of EDAMS service which is responsible for managing deployments across various devices present in the fulfillment centres across the globe

Major learning outcomes:

1. Using various AWS services like Lambda, API-Gateway, DynamoDB, IoT, Greengrass, and Cloud development kit.
2. Writing optimized backend API's consisting of core business logic, integrating them with other services like databases, api-gateways and thereby developing a full system.
3. Frontend development using React.
4. Software development life cycle - consisting of daily standups, sprints, code reviews, retrospective and estimation meetings, using pipelines for software deployment to production, CI/CD practices etc.
5. Industry level code reviews where one has to maintain top standards.
6. Unit and Integration testing.
7. Personal Skills - developing documents, writing reports, communication etc.

Details of papers/patents: Not applicable since this was a development project.

Brief description of working environment, expectations from the company: Amazon is a very firm believer of the first day principle where it encourages everyone to maintain the same enthusiasm and commitment towards work daily as one would show on his/ her first day at work. Also Amazon also keeps their leadership principles in high regards and the interns and employees likewise are expected to abide by them and use them in their day to day task. There's lots of different teams at Amazon therefore the work one gets differs from team to team. In general one gets to learn new stuff and also get to learn about AWS (Amazon Web Services) since almost everything, every project or service uses AWS in some form or other. One also

gets to learn how to code at an industry level since there is a strict code review process. Coming to work environment, it is not as chill as other companies and there is a heavy workload at Amazon. While it is team independent, in general the amount of work one has to do at Amazon is far greater than other PS stations. Also the conversion process is quite strict since they are continuously monitoring and taking feedback throughout the internship and there's bar raiser meetings and all at the end before the final decision. The teammates are friendly and they will help you with your tasks, however they only refer to resources and you have to learn mostly on your own. And the learning curve at Amazon is quite steep as there are lots of internal tools one needs to learn. Overall, if one is looking for good learning opportunities then Amazon is a good place however one needs to be ready to work for more hours and give more effort.

Academic courses relevant to the project: Software Development, Data Structures and Algorithms, Object Oriented-Programming, Database Systems, Network Programming, Operating Systems, Computer Networks.

Name: SANJIV YELTHIMAR SHENOY(2017A7PS0224H)

Student write-up

Short summary of work done during PS-II: My team at Amazon had been using a legacy configuration management system for some time. Now, that system was being deprecated and needed to be replaced with a new system. My project was to build a new configuration management system for my team. The idea was to use native AWS technology, which would be supported for a longer duration of time such that the system has a long lifetime. The project's scope included work estimation, coding, testing, and code deployment. The aim was to give a build a fully functional configuration management service within the duration of the internship. Since a new service was needed, I first had to setup the pipeline and create new packages for the code. Then, I learnt the various AWS (Amazon Web Services) technologies that were needed as part of the project like Lambda, AppConfig, CDK, API Gateway, S3, DynamoDB and more. After a basic design approach was set, I started writing code, one API at a time, building it end to end along with the integration test files. The main code was contained in AWS Lambda

functions(which activate and run the code based on a trigger) and I spent most of my time writing them using relevant Java software development kits. The testing was mostly on AWS API Gateway to verify the output for the different operations. I used AWS CDK to build all the cloud infrastructure needed for my service. This was really useful as now the service infrastructure could easily be replicated to different AWS accounts and even be rendered out as a template to allow easy building of infrastructure. Towards the end, I spent most of my time on code reviews. Once the code reviews were done, the project was completed and pushed to production. Finally, I needed to create good documentation for future reference. This was particularly important as the system will be modified in the future as and when the need arises, and a good documentation goes a long way in code maintainability.

Tool used (Development tools - H/w, S/w): AWS technologies like Lambda, CDK, AppConfig, S3, DynamoDB, SNS, CloudFormation.

Programming Languages - Java, JavaScript, TypeScript.

Internal Amazon development tools.

Objectives of the project: My team at Amazon had been using a legacy configuration management system for some time. Now, that system was being deprecated and needed to be replaced with a new system. My project was to build a new Configuration Management System for my team. The idea was to use native AWS technology, which would be supported for a longer duration of time such that the system has a long lifetime. The project's scope included work estimation, coding, testing, and code deployment. The aim was to give a build a fully functional configuration management service within the duration of the internship.

Major learning outcomes: My journey from campus to corporate was amazing. I learnt a lot about Amazon and my team's work. More importantly, I learnt the soft skills needed to work in a corporate environment. Regular meetings, one-on-ones, and stand-ups with my mentor, manager, and other team members were enriching and helped me be a better professional. As an add-on, I got the opportunity to learn many new and modern technologies, which will help me in my future projects. I learnt a lot of AWS technologies. These technologies are used by worldwide customers. Hence, this experience will be useful for me in any of AWS consumer companies as well.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Amazon is a great place to work if you are looking for exciting work and writing code that will directly impact customers. There will be a lot of learning opportunities. A mentor will be assigned to you for project related queries. Although, work can get a little hectic at times, the overall experience for me was amazing.

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

Name: SHAH DHRUVIL MANISHKUMAR(2017A7PS1566H)

Student write-up

Short summary of work done during PS-II: Created a SQS and its handler to handle charges and the business logic related to it. Also, Implemented API's that enable clients to post properties for an invoice. I also created an auto redrive for payments notification in case of exceptions.

Tool used (Development tools - H/w, S/w): Java(Spring, Guice), AWS (SQS, SNS, DynamoDb, S3), Docker.

Objectives of the project: The objective of the project was to handle charge notifications coming to SimplerInvoicingService as a part of the newly set up project Unified Ingestion. These notifications come from AWS's Simpler Queue Service (SQS) and contain information about a transportation service which translates later on to a transaction in invoice. The objective was to handle these notifications, derive and implement the business logic by understanding the business context of the project.

Major learning outcomes: Learnt about different AWS services, lombok annotations and best practices.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I found my peers very helpful throughout the internship. We have collaborated on many instances to solve many issues, and working and brainstorming with them was fun and expanded my knowledge base. Working in WFH mode has many downsides, one being not able to connect better with our colleagues. Our team had social meets every week for fun activities.

Academic courses relevant to the project: OOPS, DBMS.

Name: PHADNIS AMEYA MILIND(2019H1030012G)

Student write-up

Short summary of work done during PS-II: Customization of marketing page for Amazon Co-Branded Credit Card (CBCC) to help address the following things:

1. Decrease the customer drop-off rate.
2. Enhance the user experience and improve the conversion rate.
3. Delight and satisfy the customers by customizing the page in real-time.

Tool used (Development tools - H/w, S/w): IntelliJ Idea IDE, Spring MVC framework, JavaScript, JSP, HTML, CSS, Java.

Objectives of the project: Decreasing the customer drop-off rate, enhancing the user experience and improving the page conversion rate.

Major learning outcomes:

1. Got an opportunity to work on real-time customer facing projects, owning the project independently and taking responsibility.
2. I was actively involved in conversation with the stakeholders- product team, marketing to drive the tasks to achieve targets.

3. Handled complex tasks by breaking them down into simpler ones.
4. I learnt the Amazon Horizonte framework which is based on the Spring MVC framework and also new programming languages like JavaScript and some of its feature-rich libraries like jQuery for front-end application development.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I found my peers very helpful throughout the internship. We have collaborated on many instances to solve many issues, and working and brainstorming with them was fun and expanded my knowledge base.

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

Name: HARSH VANI(2019H1030021H)

Student write-up

Short summary of work done during PS-II: I was given a project to make a complete tool that will be used internally by our clients. The tool is a collection of CRUD Apis for DynamoDB. The complete tool development was given to me, from designing to writing integration test.

Tool used (Development tools - H/w, S/w): MacOS, IntelliJ, internal tools, Git, AWS, DynamoDB.

Objectives of the project: To make a tool to perform CRUD operations on DynamoDB.

Major learning outcomes: Learnt the whole software development cycle and also a lot of its internal tools.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The expectation from a intern is same as the SDE, which in a way is good, like I got to work on live project and my project was a significant one.

Academic courses relevant to the project: Data Structure and Algorithms, ML, etc.

PS-II Station:Amazon Professional Services, Bangalore

Faculty

Name: Prof. Preethi N. G

Student

Name: MOHIT KRIPLANI(2016B1A70870P)

Student write-up

Short summary of work done during PS-II: Wrote the entire CDK application to deploy WAFv2 resources as per the configuration customers gives in their local CDK App. Also developed some AWS config rules to check compliance status of specific resources for a client as per their requirements and internal best security practices followed.

Tool used (Development tools - H/w, S/w): AWS services(CodeSuite, CDK, CloudFormation, WAFv2, Config, Lambda), pre-commit git hook, cfn-lint.

Objectives of the project: DevOPS based WAFv2 rule update.

Major learning outcomes: Hands-on experience on some of the AWS cloud services.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Everyone is approachable. Overall, the work environment was great.

Academic courses relevant to the project: Computer Networks, OOP, Database Systems.

PS-II Station: American Express - Enterprise Digital & Analytics (EDA), Gurgaon

Faculty

Name: Prof. Ashish Narang

Student

Name: ARYAN MEHRA(2017A7PS0077P)

Student write-up

Short summary of work done during PS-II: I made a tool called 'Data Compass' wherein it takes in a dataset and gives inside out information about the dataset. This information includes but is not limited to - statistical analysis of features, clustering of features, family information of the variables involved, benchmarking of linear and logistic regression models, feature importance and selection methods and their benchmarking, variable binning, categorical to numerical conversion methods, decision tree analysis, missing value computation and Gini value/accuracy benchmarking.

Tool used (Development tools - H/w, S/w): Pandas, Scikit, Jupyter, Python, HTML, CSS.

Objectives of the project: To make a tool that can give information about a dataset inside out and let the engineer gain a benchmark for further work and feature selection.

Major learning outcomes: Most learning outcomes were implementation related - Decision trees, elastic net models etc. It was related to Machine Learning and Data Science.

Details of papers/patents: Most work is Amex specific and proprietary, but the technologies used are open sourced.

Brief description of working environment, expectations from the company: One of the most employee friendly companies. Wonderful intern experience, stipend, work-life balance and coordination. Expectation from the company should be a good experience and the work/project. Small thing to keep in mind is that most of the work is specific to American express datasets.

Academic courses relevant to the project: Any one of Machine Learning, Foundation of Data Science, Neural Networks and Fuzzy Logic.

Name: YASHDEEP GUPTA(2017A7PS0114P)

Student write-up

Short summary of work done during PS-II: My project was mainly to research and experiment on the various possible kinds of encoding and GAN variants. I compared many such techniques and tried out some new innovative techniques to ultimately find the best configuration. At the end, I also made a production-friendly end-to-end pipeline along with detailed documentation to ensure that any user can easily access the developed technique.

Tool used (Development tools - H/w, S/w): Python, Numpy, Pandas, Matplotlib, Pytorch, Bash

Objectives of the project: Generative Adversarial Networks (GAN) have been used widely for images in the literature. However, there has been very little research for their usage in data

augmentation for tabular data. Therefore, as part of my internship project, I had to explore the various ways in which we can attempt to encode tabular data, such that we can perform data augmentation on it. I performed various experiments on different types of possible encodings as well as different varieties of GAN to pick the optimal configuration for my project.

Major learning outcomes: I experimented on the various possible techniques of tabular data encoding using Python, Numpy, Pandas and Matplotlib. I also tried out many variants of GANs to find the suitable variant for our project. I used Tensorflow and Pytorch for the coding of these GANs. Further, I developed an end-to-end GAN pipeline using Python and Bash. I also parallelized some of the code using unix commands and Bash. I learnt a lot about the production environment and the protocols that must be followed when deploying any software to the production queue. I also learnt about the documentation formats followed in the company.

Details of papers/patents: No papers/patents were published as a part of internship project.

Brief description of working environment, expectations from the company: The company provided a very friendly and guided working environment. My mentors were really helpful and guided me throughout the project. The timings were flexible and no hard deadlines were given. One can expect a very cooperative working environment in the company.

Academic courses relevant to the project: Neural Networks and Fuzzy Logic, Machine Learning.

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

Faculty

Name: Prof. Satya Yedlapalli

Student

Name: SHAH BHOOXI BHOWMICK(2017A3PS0249G)

Student write-up

Short summary of work done during PS-II: As a part of the product applications team, the main focus was on developing products to enhance customer experience and user satisfaction for an in development chip. Work was done to create software to control the chip, monitor the internal changes and test the functionality.

Tool used (Development tools - H/w, S/w): Ostinato, Wireshark, Scapy, Ethernet and LAN related HW, Scapy.

Objectives of the project: To secondary products to use in tandem with a device for better functionality.

Major learning outcomes: Ethernet, Industry 4.0, Hardware debugging, Network analysis.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: WFH set up with a small team and close contact with supervisors.

Academic courses relevant to the project: OS, MuP, CompArch, CP, ESD, AVA.

Name: INGAWALE ADITYA BAPURAO(2019H1230529G)

Student write-up

Short summary of work done during PS-II: Worked with the Engineering enablement team in developing AVIP on Emulation Platform - Palladium Z1.

Tool used (Development tools - H/w, S/w): Cadence Xcelium, Emulation - Palladium Z1.

Objectives of the project: Implementation of a protocol layer on the emulation platform - Palladium z1.

Major learning outcomes: System Verilog, UVM, Transaction Based Acceleration with Emulation Platform - Palladium Z1.

Details of papers/patents: NA

Brief Description of working environment, expectations from the company: Supportive working environment with many new things to explore. Stick to the deadlines. In case of any doubt feel free to ask as the colleagues are always there to help us.

Academic courses relevant to the project: A course on VLSI test and testability would have been relevant as well as helpful to the project. System Verilog and UVM are must for digital verification.

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

Faculty

Name: Prof. Sandeep Kayastha

Student

Name: NAIR RISHI SAJIT(2017A3PS0453G)

Student write-up

Short summary of work done during PS-II: I worked with the newly formed analytics team of ANS commerce. My work mainly revolved around understanding the data/reporting needs of various marketing and business stakeholders within the organization and develop various automated reports and dashboards bringing together data from multiple sources and produce actionable insights from this. Also worked on creating logics to send alerts like underspending, overspending, etc. to respective stakeholders. Presented reports and dashboards like Inventory report, ROI report, etc. to the internal teams.

Tool used (Development tools - H/w, S/w): Google sheets, MySQL workbench, Google DataStudio.

Objectives of the project: Automation of marketing analytics and reporting.

Major learning outcomes: Learnt how performance of marketing campaigns are tracked and business importance of various metrics. Also got an understanding of how various sectors in a E-commerce business like marketing, inventory management and others work together.

Details of papers/patents: Not applicable

Brief description of working environment, expectations from the company: Since ANS commerce is a growing startup, the hierarchy is relatively flat. Employees are helpful and approachable. Working expectations depends on your manager and your goal, but yeah they expect an intern to be committed to the work routine.

Academic courses relevant to the project: 1. Marketing Research 2. Principles of Management.

Name: GAURAV SINGH RAWAT(2017A4PS0914G)

Student write-up

Short summary of work done during PS-II: Product management.

Tool used (Development tools - H/w, S/w): Jira, ASANA, MySQL, Postman, MS excel, Opencart.

Objectives of the project: Managing, bug fix and product enhancement for Ecommerce stores.

Major learning outcomes: Managing, bug fix and product enhancement for Ecommerce stores. Learnt creating user stories, workflow in ecommerce, managing and working in team of Dev, UI, business and marketing.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Good company to keep your first step in ecommerce. ANS commerce provide solutions to companies seeking for there online presence it work on bring similar solution like shopify in India.

Academic courses relevant to the project: Yes definitely management, finance related courses will provide additional benefits.

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

Faculty

Name: Prof. Sandeep Kayastha

Student

Name: ASHUTOSH KUMAR SINHA(2015B4A10825G)

Student write-up

Short summary of work done during PS-II: □Automated the process of exporting the daily sales report to the client, reducing the time spent on manually sending the report 4 times a day.

□Created a report on zonal division of sales and orders, used metrics for better analysis of the division based on zones helping in increase of sales in the zone under consideration by almost 10 % points in the subsequent month.

□Set-up the process of creating inventory reports (on-shelf availability report), MIS report, delivery report for our warehousing heavy clients, leading to better visibility of sales on SKU level and helping in targeted advertisements for higher selling SKUs.

□Planned inventory on SKU level for the month of May, by analyzing sales numbers for the past 6 months for 3 clients, leading to a jump in sales numbers in May by almost 33%, 15% and 7% respectively, reaching the targets for 2 of them for the first time in 3 months.

□Created a process and put in action for timely evaluation of all seller metrics on different seller portals, leading to 0 account deactivation in the past 2 months.

□Conducted a profitability check for the existing SKUs being sold for a client, discarded the non-profitable products and created 24 new profitable combos from the existing base products, leading to sales numbers being on track to achieve the projected figure for the month of June.

□Conducted an RCA together with the operations team, successfully identifying the issue behind sudden increase in the number of unfulfilled orders and returns, reducing their number by almost 80% for the month of May.

Tool used (Development tools - H/w, S/w): Excel, Uniware, Amazon seller portal, Flipkart seller portal, Asana, Clickpost, Seller flex.

Objectives of the project: As a part of the business team, main objectives are to provide various E-commerce solutions for clients like warehousing and inventory management using

WMS like UNIWARE, marketplace management using project management tool like ASANA and sales and orders management using Amazon seller portal and Flipkart seller portal.

Major learning outcomes: Excel, WMS, seller portals, professional ethics, team work, management skills, presentation skills, inter-team functions, workings of e-commerce industry.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment was very friendly and favourable for a new joinee to learn new stuff as quickly as possible. There is a standard heirarchy in the team, escalation points, which help you clear all your doubts. There is freedom of creativity. The environment makes you inquisitive, makes you ask questions.

Academic courses relevant to the project: Development economics, optimization, professional ethics, statistics, operations research, Excel by tutorials point.

Name: RAM KARTHIK REDDY(2016B1A20937P)

Student write-up

Short summary of work done during PS-II: I was mainly involved with the project team. The goal is to deliver a project (in this case a website) on time, meeting all the client requirements. In short the client comes with a design for a new website (or an existing one) and we have to give instructions to tech team and have them create a website. The website is then showcased to the client and approval is expected. We then publish the site once we get the approval and this marks the completion of the project. In general, a new website project generally takes around 9-12 weeks. My role is to manage the project and ensure that the project is on-time and in budget. During my stint at ANS commerce, I have managed to complete the wesbite thenaturalfood.in from start to finish with the project being completed in 8 weeks.

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

Objectives of the project: To manage the creation a new ecommerce site for brands.

Major learning outcomes: Project management.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment was friendly and professional. People would always find time to teach and explain the working of the software they use. All they expect is us to be responsible and accountable for our actions. They expect us to learn things quickly.

Academic courses relevant to the project: Development economics, Operations research.

Name: MANDALAM TARUN(2016B2A10583G)

Student write-up

Short summary of work done during PS-II: Processing and analysis of sales data to optimize brand strategy.

Strategic and operational support of cross-functional project team responsible for business strategy and operations.

Client/ brand onboarding, website development - developed website for two major brands (superdry and west elm).

Support of the project team for Kaya youth, Being Human, and several others in the field of change management - reduced the TAT for blog management process from 3 days to 2 days with the use of HTML and CSS.

Tool used (Development tools - H/w, S/w): Google analytics, Excel and Kartify - Their own tool.

Objectives of the project: Get an understanding about E-commerce operations and how to help the company in terms of strategies moving ahead.

Major learning outcomes: Overview of company operations, blog management, basic knowledge of company websites and how it's built, content writing, client onboarding, MS – excel and GA knowledge, team work and deadline compliance, presentation-making, group discussions.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: The working environment and especially the team was great, they helped me better understand the whole process and helped all the way.

Academic courses relevant to the project: Accounting and financial analysis.

Name: MANISH KUMAR THAKUR(2017A1PS0946P)

Student write-up

Short summary of work done during PS-II: Worked as a business analyst (marketing). Created many dashboards for marketing performance analysis and reporting. Worked on the MVP and a few initial iterations of a new product being developed by the company.

Tool used (Development tools - H/w, S/w): Google sheets, Google data studio, Power BI, SQL, Google BigQuery, Google Apps Script, Python.

Objectives of the project: Assist digital marketing team by providing reports, dashboard and insights of marketing campaigns.

Major learning outcomes: Understood the basics of business analytics, its scope and how it creates immense value to a company. Learnt many dash boarding and data processing tools like excel, SQL and BigQuery. Learnt a lot about digital marketing.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Got a chance to work with the top-level highly experienced executives and learnt a lot about E-commerce sector.

Academic courses relevant to the project: DBMS

Name: DAYMA AMAN AJAY(2019H1490850P)

Student write-up

Short summary of work done during PS-II: I made dispatch report, sales report, inventory report and sent to 3 brands on daily basis. For this, I required to download data sheet twice a day from unicommmerce software and convert the file into excel sheet. I used pivot tables to summarize & highlight the main outcomes. I did sales analysis on daily & monthly basis for the assigned brands. I handled & solved customer queries and complaints and made sure to solve them within 2-3 days. Refunds were made using Razorpay software. I did root cause analysis on certain queries which were recurring and stopped them permanently.

For inventory analysis, I applied famous ABC analysis for comparison of SKUs. This is how I converted my theoretical knowledge into practical. I made my own analysis model for inventory stocks & purchase order anaylsis, known as “triple layer inventory model”. I did competitive analysis between ANS, Flipkart & Amazon for a particular brand and successfully presented the outcomes to the business director. I also did quality check of the website before its launch for a few brands. Overall, I helped the team immensely in streamlining their business processes & gave them potential analysis models for future easement of inventories for various brands.

Tool used (Development tools - H/w, S/w): MS Excel, Unicommerce, Razorpay, Shopify, Google spreadsheet.

Objectives of the project: To summarize the monthly/quarterly data and present it to all the stakeholders, making it very easy for them to understand and analyze to forecast for the coming months, in order to strategize & intercept growth of the business through sales.

Major learning outcomes: I learnt various loopholes & problems a business faces and how to streamline them using different tools, techniques and models. It also made my excel skills strong. I learnt how an E-commerce solutions providing company works and what solutions can they offer in different fields such as marketplace, advertising management, warehousing and website designing.

Details of papers/patents: I made a basic very effective inventory stocking model to cater SKU qty while making PO. This model can be very effective for FMCG products with shelf life of not more than 6-8 months. Advantage - the weighted average quantity can be verified.

Brief description of working environment, expectations from the company: ANS commerce is an E-commerce solutions provider startup based in Gurgaon. It has scaled up a lot in the last two years and looking to expand more by onboarding more major clients. My time here was completely remote i.e., work from home due to lockdown & covid pandemic. Me being an intern, my assigned work was to help in the business operations and bring permanent changes in the working to upscale the growth. Fortunately, my reporting manager was very supportive and so was my team. They encouraged me, taught me and had patience to bring out the best in me. The working culture is very descent as per my observation.

Academic courses relevant to the project: Accounting and Financial Analysis, DBMS.

Name: SATYARTH KUMAR(2019H1490856P)

Student write-up

Short summary of work done during PS-II: As a member of the business team, the duties and responsibilities performed by me are to ensure client requests are handled within time, coordinate with internal teams i.e technical team, design team, marketing team and catalogue team, to track and analyze the performance of the brands daily and making sure the solutions are provided in the given turnaround time. This required extensive use of the softwares like Google Ads Manager, Facebook Ads Manager, Google analytics, Data studio, Kartify and MS Excel making Brandstore management my primary task.

The client requests range from changing marketing strategies to website enhancements. Hence, to perform my duties work on front end i.e the client facing side and backend i.e internally on Kartify (A full stack in house e commerce solution platform).The Major clients I worked with were: Khadims, Pure Home and Living, Dr. Odin, Ruosh and other brands like GrandPitStop, Celio and Florshiem.

Tool used (Development tools - H/w, S/w): MS Excel, Data studio, Kartify, Google Ads Manager, Facebook Ads Manager, Google analytics and Scintilla/Sublime text.

Objectives of the project: 1. Brandstore Management 2. Client Management.

Major learning outcomes: Since, it was my first experience in the industry, I majorly gained experience in team work and team building. Team dynamics is one of the most important factors in determining the performance and hence the ability to provide solutions.

Next I was able to work on many new softwares that are essential in todays digital marketing to track and analyse performance and target niche markets. Hence, learning them was plus point as I wish to pursue my career in marketing.Further I developed better communication both verbal and non verbal since client management was my main objective.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment was challenging and motivating at the same time. This is due to the strong and ethical management I worked under. New opportunities were provided to me on several occasions which though challenging at first paved way to greater learning. My expectations were no different from the one mentioned. Not only within the business team the dynamics was

upheld, it was the same with the cross functioning departments. The firm has a hybrid structure and is a mix of cross functioning and functional divisions topped by a hierachial structure. The employees throughout the structure are helpful and friendly. I received help from my fellow colleagues whenever required.

Academic courses relevant to the project: Marketing, Human Resources, Organisational Behaviour, Project Management.

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

Faculty

Name: Prof. T.V. Rao

Student

Name: VINAYAK AGGARWAL(2017A7PS0008G)

Student write-up

Short summary of work done during PS-II: Worked on iOS, ML, NLP related projects. Worked on building something at the interaction of iOS development along with Natural Language Processing using apple frameworks such as CoreML & CreateML.

Tool used (Development tools - H/w, S/w): Xcode, Python, Jupyter, ML, NLP, DL, iOS, CoreML, CreateML.

Objectives of the project: Integrating iOS development with NLP.

Major learning outcomes: iOS Dev, Natural Language Processing.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Confidentiality is the first priority. People are good & knowledgeable. Will help you around and are available.

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

Name: PRATHMA CHOWKSEY(2017A7PS0059H)

Student write-up

Short summary of work done during PS-II: The project allotted to me involved full stack development and automation. I was required to add a new channel to a pre-existing application. The work involved developing backend APIs using Spring Boot and Java and corresponding front end components using Swift. The second part of the project involved automation using machine learning and natural language processing. My role wasn't limited to that of a 'developer', and I got exposure to work as a 'product lead' on this project, with my involvement in all the stages - business requirements, engineering requirements, technical design, backend and frontend development and machine learning.

Tool used (Development tools - H/w, S/w): Spring Boot, Java, Python, Tensorflow, Swift.

Objectives of the project: Full Stack Development, Automation.

Major learning outcomes: I got an opportunity to work in one of the top companies of the world and this served as a good exposure to work in the tech industry. I got to work closely with a diverse set of people from various teams, domains and different parts of the world. I was almost single handedly in-charge of my project and therefore took a lot of key decisions and this had a positive impact on my leadership skills. I also had a lot of technical learnings in terms of new tools and the best industry practises.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: The culture is good, overall, but varies from team to team. In general, people work long hours (~ 12 hours a day) because they work closely with US based teams and therefore need to be in meetings at night as well. People are nice, but usually quite busy and therefore it is sometimes difficult to get timely collaboration from them.

Academic courses relevant to the project: Object Oriented Programming, Database Systems, Data Structures and Algorithms, Software Engineering, Machine Learning, Data Mining, Deep Learning, Neural Networks and Fuzzy Logic.

Name: SAHIL JAIN(2017A7PS0105G)

Student write-up

Short summary of work done during PS-II: My team is Apple online store. My project is to create an internal tool for managing Apple's product data and its meta data (colour of iphone, capacity, screen size etc) for apple.com.

Tool used (Development tools - H/w, S/w): Python, HTML, CSS, Javascript, GIT, Java, Spring Boot.

Objectives of the project: To create an internal tool for business team.

Major learning outcomes: 1. Understanding requirements: The business team would be the "customers" of my tool, so I had to understand what they wanted out of it, what their use cases are, also. I have to collaborate with my co-intern, mentors and team to understand and implement different ideas.

2. I learnt multiple technologies. I had no prior experience in web development, so I had to learn javascript and its graphical libraries from scratch over the past few months.

3. Since there is no pre-defined idea about the visualisation of different dimensions. We have to try different approaches and have to think in an innovative way.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The culture of my team (Apple online store IS&T) is pretty good. Environment and project allocation depends upon the team you have been allotted.

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

Name: AYUSH SINGHAL(2017A7PS0116P)

Student write-up

Short summary of work done during PS-II: The team's applications are currently deployed on bare metal servers and serving a large user base. Due to various updates, these applications are now to be used for an even wider user base, thus requiring a large increase in the scale of the deployments. This scaling if done on the on-premise servers, will lead to inefficiencies in the resource utilisation thus leading to extra cost incurred. It would also be highly time consuming to host them on the bare metal servers where all of the updation and management is done manually. Thus, there is a need to shift to a system, which can allow us to scale the applications without any need of manual intervention. We also want a system, where we can update our applications seamlessly and in as less time as possible. Thus, we look into the Cloud which provides all of these functionalities.

Further, the internal framework that SCI team uses to develop applications is currently in a Monolithic form, with all the services bundled tightly together. For any new developer, to use the framework, he needs to first completely understand the entire framework with its multiple dependencies and services. But, in many of the cases, where not all of the provided services are required, this proves to be a bottleneck. The solution for this problem was to transform the framework into a micro service type, with each individual service hosted as a separate service on the cloud or a bare metal server and be accessed using API requests.

Tool used (Development tools - H/w, S/w): S/w - Docker, Kubernetes, Springboot, Python, Angular, Nginx, AWS.

Objectives of the project: To shift team's application to cloud and further enhance the team's internal framework.

Major learning outcomes: I learnt various new technologies such as Springboot and Angular. I also gained a deep knowledge about various cloud technologies and how to utilise them. I learnt the principles, cycle of software development, from planning to design to development, testing and deployment. I also learnt various soft skills to present in front of higher ups in the company.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment was very conducive with a lot of support and help provided by the team. Students can expect to learn a lot of things in a rapid pace. Work done was meaningful and will be utilised by the company and team in the future.

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

Name: KUNAL MOHTA(2017A7PS0148P)

Student write-up

Short summary of work done during PS-II: I worked as part of the power driver team at Apple. My project required creation and use of test framework that makes it convenient for power software modules to be tested. The internship started with studying of the existing infrastructure of the framework and understanding the required functionalities to be added. After that, my tasks were to add test cases using this framework for some of the power modules.

Tool used (Development tools - H/w, S/w): Programming languages: C, C++, Python, Bash
Other S/W:- Git, Jenkins.

Objectives of the project: The aim of the project is to develop test framework that helps in testing the power management software modules. Test cases for these modules are also to be developed and hooked with the framework.

Major learning outcomes: Software testing techniques, usage of debuggers for large-scale projects, general C programming practices, basics of power management software on a chip.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment of my team is decent. All the team members are conveniently accessible for communication and clarifications for work related queries.

Academic courses relevant to the project: Operating systems.

Name: ADITI MANDLOI(2017A7PS0160P)

Student write-up

Short summary of work done during PS-II: The project was to understand the need for monitoring and alerting over metrics, understand the requirements and features, and develop tools to help create efficient monitoring and alerting.

Tool used (Development tools - H/w, S/w): Java, Spring-boot, Spring-MVC, gradle, Git.

Objectives of the project: It would help teams to prioritize their work, delegate the responsibility of oversight over metrics to an automated system.

Major learning outcomes: I learnt engineering aspects related to large scale development. I also improved my interpersonal and networking skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Very encouraging environment. We are expected to take initiative and ownership of the project and be proactively involved in the project.

Academic courses relevant to the project: Database Systems, Object Oriented Programming

Name: EKANSHI AGRAWAL(2017A7PS0233H)

Student write-up

Short summary of work done during PS-II: Compared and evaluated workflow management systems (open source and apple internal) to understand their features and narrow down on one that can be used across several use cases as a general purpose workflow engine. This helped bring down the need to make and run single purpose engines for specific use cases. Using the chosen workflow, I automated a use case for infrastructure provisioning for security contexts, which help bring down manual intervention and brought down the time taken from 6-8 hours to a few minutes.

Tool used (Development tools - H/w, S/w): Java, Python, Docker, Temporal.io workflow engine, other internal tools.

Objectives of the project: Use case implementation on top of a general purpose workflow engine.

Major learning outcomes: Building and understanding workflow and orchestration technology.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Everyone is quite friendly and understanding. At times there is a need to work late at night to attend meetings with the teams in Cupertino (US) people are really helpful and encouraging and they take time out to help new hires and interns.

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

Name: SIMRAN MALIK(2017A7PS1631H)

Student write-up

Short summary of work done during PS-II: I worked on the UI of a web portal for internal usage by Apple teams.

Tool used (Development tools - H/w, S/w): Angular Framework, Java.

Objectives of the project: To design and implement the UI of web portal for internal usage by Apple teams by understanding all product requirements and architecture of the portal.

Major learning outcomes: 1) Experience in front-end development2) Angular framework implementation3) Estimating timeline of a project4) Communication skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Since it was WFH, the work environment of the actual office could not be experienced. However, in terms of expectations, my mentor and project lead expected me to understand the product requirements, understand the architecture of the web portal, come up with a set of UI mocks and complete

implementation of the UI. Since the entire UI was handled by me, I had a good experience in time management and collaboration skills.

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

Name: PRATIK RAVIKUMAR SANGHAVI(2017AAPS0394G)

Student write-up

Short summary of work done during PS-II: Involved in verifying certain feature in cellular networks impacting handover scenarios and identification of bugs in the existing code. This is being verified in numerous configurations so as to provide better connectivity and improve user experience in cell edges as well as blind handovers from one Radio Access Technology to another aimed at creating a nearly seamless transition between RATs.

Tool used (Development tools - H/w, S/w): C Programming, Git version control, Swift, SwiftUI.

Objectives of the project: Increase the robustness of network protocols.

Major learning outcomes: Learnt about cellular networks in detail especially with regards to the layer with which my team is involved with. Also had the opportunity to learn app development in order to develop an internal tool for aiding the analysis of signaling between the components.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: My team constitutes a talented and helpful bunch of people who were instrumental in aiding my understanding of the cellular protocol stack as well as familiarizing me with the internal architecture of Apple for the same. I'm currently involved with verifying and identifying bugs in a certain feature that impacts handover scenarios. I was also involved (albeit to a very small

degree) in the development of an internal tool that could be a more refined way for analyzing signal flow for the team.

Academic courses relevant to the project: Computer Networks, C Programming.

PS-II Station:ARM Embedded Technologies Pvt. Ltd., Bangalore

Faculty

Name: Prof. Rekha A

Student

Name: RISHAV SINGH(2019H1400119P)

Student write-up

Short summary of work done during PS-II: I was given the task of setting up the whole infra for verifying the external debugger functionality of the CPU based on Arm v8-M architecture. The project was more of development type and I was given the sole responsibility for it. Initial few days were given for ramping up on architecture and Microarchitecture of Arm v8-M, specific to external debugger. This was followed by test plan generation, creating a testbench structure to drive the whole test, where tests could be carried out using random instruction sequence (RIS) tool. The testbench part involved working extensively on system verilog to create an appropriate base. Based on this infra, some tests were also carried out where we could find some interesting bugs that were notified to the designers.

Tool used (Development tools - H/w, S/w): Linux, System Verilog, Python scripts.

Objectives of the project: To set up the whole infrastructure to verify the External debugger functionality of the processor based on Arm v8-M architecture.

Major learning outcomes: System verilog, Verification flow (industry level).

Details of papers/patents: None

Brief description of working environment, expectations from the company: Arm is basically a company which works solely on IPs. The Bangalore division is responsible for verification of these IPs at architectural and CPU level. The quality and freedom of work is one of the best in the semiconductor industry. The technical teams have really good knowledge base and the growth is exponential.

Academic courses relevant to the project: Embedded system design, VLSI architecture, Advanced VLSI architecture, VLSI test & testability.

Name: BIRAJDAR SNEHAL REVANSIDDHA(2019H1400559H)

Student write-up

Short summary of work done during PS-II: Work was related with CPU pre-silicon validation. Different methods are used for validation to ensure functional correctness of the design. This includes performance and power goal verification, design protection and safety, and difficulties with multiple asynchronous clock domains. Work was focused on RTL verification, identifying the flaws or bugs and reporting it to the respective team and finally resolving the issue. Understanding the ARMv8 architecture and CPU specification for debugging.

Tool used (Development tools - H/w, S/w): Turbo ETX, Synopsis verdi.

Objectives of the project: Identifying the bugs in the design and making it clean.

Major learning outcomes: Got familiar with ARMv8 architecture and its extensions, RTL verification flow, assembly language, perl and system verilog.

Details of papers/patents: NONE

Brief description of working environment, expectations from the company: Work environment is very good. Manager, mentor and each team member are very helpful and supportive. Everyone treat you as a part of team. Provided help and support for the covid situation by providing more sick leaves, oxygen supply for the employees working in Bangalore.

Academic courses relevant to the project: VLSI architecture, VLSI test and testability.

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

Faculty

Name: Prof. Naga Vamsi Krishna Jasti

Student

Name: VARADA VINOD NAMBIAR(2019H1430568H)

Student write-up

Short summary of work done during PS-II: In the first half of the PS, I was involved with the technical support team. Here I answered customer queries on the company software and their models. Skills required and learned were that of investigation and identification of issues within structural models of customers, problem-solving and arriving at a workaround, if not a fix. Also required constant contact with the customers via video meetings or formal written communications. The second half was all about software development. Here, I carried out bug

fixes, assigned with creating simple new features for the software and refactored legacy code to avoid warnings and errors. Had the opportunity to work with colleagues across UK and Poland as well.

Tool used (Development tools - H/w, S/w): C++, Javascript, Visual studio, Visual studio code, Service desk, Oasys softwares: GSA, AdSec.

Objectives of the project: To learn the ways of the company and pick up skills required to work on a full time job there.

Major learning outcomes: Coding skills in C++, Javascript, vue.js, Customer relations and support. Working across interdisciplinary teams spanning globally.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment was great. Received good support from my line manager and training from the team. Gave us access and the opportunity to learn multiple skills in addition to real-time experience in a working industry. The firm respects individuality and hence encourages diversity, equality and inclusion. The company expects professionalism and honest dedication.

Academic courses relevant to the project: Basic structural courses helped me understand the code they had created already. Programming skills had to be learned by myself with the help of the team if in case of doubts.

PS-II Station:ASA Industries, Noida

Faculty

Name: Prof.Nithin Tom Matthew

Student

Name: KOLI CHAITANYA ANIL(2019H1060033H)

Student write-up

Short summary of work done during PS-II: Being a manufacturing firm, ASA industries, had given me the task to bring in automation in their manufacturing activities so that the human intervention in manufacturing activities is reduced to as less as possible. For this purpose, I had designed and installed a low cost automation mechanism for rotor press machine. This resulted in improved production, improved quality and improvement of overall efficiency of manufacturing activities. I also had proposed a design of vibratory table for automatically feeding rotors which could be installed in line with low cost automation. The proposed design was approved and accepted by management. I also handled other activities like techno commercial proposal for Vertical machining center (VMC) for tool room applications, discussion on implementation of SCADA system. Next plan of organization is implementation of SCADA system.

Tool used (Development tools - H/w, S/w): MS office, Festo fluid sim, Creo parametric, Solidworks, Ansys.

Objectives of the project: Conceptualizing, designing and developing low cost automation mechanism to improve productivity and quality of products for organization.

Major Learning Outcomes: -I learnt how the daily business activities of an organization take place.

- I learnt how to bridge the gap between academic learning and its utilization in industry.
- I learnt how any new idea is conceptualized, how that idea is conveyed to the management and how it is implemented in real life.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: - We had direct exposure to machines and manufacturing activities which gave important insight into organization business.

- Hands on experience of research and development activities.

Academic courses relevant to the project: CAAD, product design, production technology, mechatronics , strength of materials, applied mechanics.

Name: HANDE GAURAV PRAKASH(2019H1060520H)

Student write-up

Short summary of work done during PS-II: We worked on multiple projects in internship. Some projects were related to Industrial automation and some were related to design.

- 1) In the Industrial automation project, the power press in the company was having a problem of part bending because of improper positioning of parts during pressing; many parts were being rejected so in order to avoid this part bending problem & to improve the quality of parts being pressed Automated rotor feed mechanism developed.
- 2) Tool design projects contains design of 9 cavity & 4 cavity pressure die casting tools. We developed full scale CAD modelling of 9 cavity & 4 cavity PDC tools and also prepared manufacturing drawings with BOM..
- 3) In sprint fan top cover project the final product produced by using four different series of die operations. We performed the deep drawing simulation (non-linear analysis) for 2nd draw operation using ANSYS workbench.
- 4) In design and development of heat treatment basket project we designed & developed heat treatment basket for BLDC components. Developed 3D CAD modelling using creo & also prepared Manufacturing drawings with BOM.
- 5) In Megamite fan top & bottom cover project we performed modifications in existing fixture & redesign punch,die, and projection welding fixtures. Developed 3D CAD modelling & geometrical dimensioning & tolerancing.

6) Installation of 19 roller sheet straightener machine. Layout using AutoCAD software& structural analysis of mounting bed using ANSYS workbench.

Tool used (Development tools - H/w, S/w): AutoCAD, Creo parametric, Solidworks, ANSYS Workbench, Festo fluid sim software, Microsoft Excel, Microsoft PowerPoint.

Objectives of the project: i)To perform the automation in rotor feed mechanism of power press. ii) To conceptualized & design of heat treatment basket, pressure die casting tools, deep drawing tools iii) To perform non-linear structural analysis of sprint top cover fan iv)To develop the layout for 19 roller sheet straightener & perform actual installation.

Major learning outcomes: 1) Automated rotor feed mechanism for power press

i) In automation we studied how to select pneumatic cylinder, proximity sensors as per application from the standard manuals. Working of pneumatic cylinder, proximity sensors and direction control valves. Synchronization of pneumatic cylinder with press machine with help of sensors & development of electrical circuit diagram.

ii) Learnt Festo fluid sim software

2) Design of heat treatment basket

i) Learnheat treatment process in detail, need of heat treatment process, different heat treatment furnaces, furnace capacity, maximum temperature of furnaces, time required for one charge capacity.

ii) Learnt 3D CAD part & assembly modelling, preparation 2D manufacturing, drawings & also how to make BOM. Weight calculation by using software's.

3) Installation of 19-roller sheet straightener on PP3 machine.

Learnt the detailed working of 11 roller & 19 roller sheet straightener, stamping operation, feeder working.

4) Finite element modelling & analysis of sprint top cover.

Learnt deep drawing operation in detail.

5) Design of 4 & 9 cavity PDC tools.

Aluminum pressure die casting operation, different PDC tools operations, nitriding.

6) Megamite top and bottom cover tool design.

i) Learntprojection welding operation & how nut, bracket, bearing housing welding takes place on fan cover by using projection welding.

ii) Learnt deep drawing operation in detail also studied design of punch, die, clamping arrangement, pressure plate, rings.

Details of papers/patents: No

Brief description of working environment, expectations from the company: The work environment was good; mentor is very supportive & helpful through out the work. I gained quite good exposure to how the industry life works and how challenging it can become.

Academic courses relevant to the project: Finite element method, Computer aided analysis & design, Product design, Machine tool engineering, Mechatronics, Manufacturing processes.

Name: ADITYA SANJAY PAI(2019H1410164H)

Student write-up

Short summary of work done during PS-II: 1. Automated rotor feed mechanism for rotor press machine.

2. Design of beam structure and buckling analysis of vertical pillars.
3. Design and installation of product stack height monitoring mechanism for quality improvement of products.
4. Design of vibrating table for rotor parts accumulation.
5. Techno commercial proposal of vertical machining center machine for tool room applications.
6. Design and analysis of the heat treatment furnace mounting structure.
7. Design and analysis of the tool bed rack for tooling assembly installation.
8. Fan cover fixture assembly development (Megamite).

Task completed: Flow analysis of aluminium molten metal in shot sleeve of 160 ton pressure die casting machine.

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

1. Vernier Caliper
2. Screw Gauge
3. Relays, Sensors, Pneumatic Cylinder
4. Weighing Machine

Softwares

1.Solidworks
2.Creo
3.AutoCAD
4.Ansys Workbench
5.Ansys Fluent
6.Fluid Sim by Festo

Objectives of the project: To design and install a mechanism to automatically feed the rotors to rotor pressing machine.

Major learning outcomes: 1.Practical Implementation of the automation of the power press machine and its advantage in increasing the productivity and quality of the product.

2. Analysis of the heat treatment structure pillar in Ansys software and post-processing the results based on the application of the load, its durability, total deformation and stress distribution along the channels and beams.

3.Understanding of the working of the stack height monitoring mechanism as its ability to determine the weight of the stator and rotor parts based on the stack height which lies in the permissible range.

4.Understood the need to eliminate human intervention by feeding 90 to 100 rotors on the table at once for pressing operation.

5. Techno commercial proposal of VMC will result in less amount of time on reworks on tools and more efficient work output. This would result in increased revenue and better quality of product.

6.Perform different iterations of design based on the load applied by the cooling retorts on the channels and study the results of max deformation and critical stresses developed at the load application.

7.Structural analysis by application of proper boundary conditions and post-processing the results obtained in terms of total deformation and stress distribution.

8.Understanding of projection welding in detail.

Learnt 3-2-1 principle of location.

Understood the concept of current flow through the electrodes.

Implemented the moving plate and spring arrangement concept for uniform distribution of the load so that all the points of the nuts, bearing housing and the bracket will come in contact with the fan cover.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work culture in the company is good. Our mentors were supportive regarding the projects to be carried out. Whenever we had any queries or doubts regarding the projects, we were allowed in their respective cabins at any time. There was a healthy communication with the other staffs as well. Overall this internship was a great experience.

Academic courses relevant to the project: Mechatronics, Strength of materials, Machine design, Finite Element Method, Production engineering, Heat transfer, Thermodynamics.

PS-II Station: Ascendo AI, California

Faculty

Name: Prof. Sonika Chandrakant Rathi

Student

Name: SUNDEEP KUMAR AMMISSETTI(2017A7PS1218H)

Student write-up

Short summary of work done during PS-II: Worked on a project to combine a chatbot with a live agent customer support application for clients (other companies which want customer support apps). Worked on creating frontend for the agents using Angular, backend APIs were made in Python and using various frameworks like Flask and then switched to FastAPI. Also learnt to use Socket.IO JavaScript library for real-time communication between client and server so users on chatbot can talk to live agents.

Tool used (Development tools - H/w, S/w): MySQL, PostgreSQL, MongoDB, Angular, Flask, Socket-IO (javascript library), Grafana.

Objectives of the project: The main objectives of the project are to help create a live-agent customer support application that connects with chatbot to interact with multiple end-users.

Major learning outcomes: Learnt new technologies quickly, agile methodology of software development, and learnt how to communicate in a working environment.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work Timings can vary everyday and we are expected to work as much as we can (avg. 10 hours/day). Requirements of tasks and priorities can change so we have to adapt. Everyone is very helpful as long as you ask so you are expected be more outspoken. You are also expected to learn new technologies, even the ones that the company has never used, very frequently if required for a new project or task.

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

PS-II Station:Asteria Aerospace Pvt. Ltd., Bangalore

Faculty

Name: Prof. Swarna Chaudhary

Student

Name: RALLABANDI ANANTH TEJASVI(2017AAPS1236H)

Student write-up

Short summary of work done during PS-II: I worked with the systems integration team, which deals with projects right down from product design and requirements, to final testing. The project assigned to me was to determine if the existing radio hardware is capable of mesh networking functionality. This involved learning about the existing hardware architecture, writing Python scripts to test performance, brainstorming testing strategies, etc.

In addition to this project, I was also involved in writing a Python based application to create a pass report during dynamic testing of a production UAV, which was in collaboration with the embedded software team. As an extension of this project, I was also tasked figuring out a way to analyse a large number of flight logs, and gain insights using the Elastic stack.

Tool used (Development tools - H/w, S/w): Asteria A410 UAS, Python, Elastic tools.

Objectives of the project: To explore mesh networking functionality on existing UAS hardware.

Major learning outcomes: Software development with Python, understanding of Elastic architecture, serial and radio communication.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: The working environment is collaborative, with a good amount of communication between colleagues. Frequent meetings occur between teams to discuss topics, such as company updates, knowledge transfer, project updates, etc. The employees I worked with were helpful and willing to answer any questions I had, and help me out with various issues I was facing.

Academic courses relevant to the project: Basics of Computer Networking and Computer Programming.

PS-II Station:Atkins, Bangalore

Faculty

Name: Prof. Mahesh Kumar Hamirwasia

Student

Name: G ARVIND KUMAR(2019H1300162H)

Student write-up

Short summary of work done during PS-II: My PS @ Atkins, had roughly 4 phases,

- (1) Phase 1 involved gaining a working knowledge of UK highway engineering standards (DMRB, TSRGD, TSM, MCDHW, etc.).
- (2) Phase 2, I worked in the mid wales resurfacing scheme which was a maintenance project (condition assessment of kerbs, footways, traffic signs, etc. & authoring relevant parts of the optioneering report to be submitted to client).
- (3) Phase 3, I worked on the A465 (in Wales, UK project. Specifically on the RRRAP process (which takes care of road safety aspect & involves designing alignments of crash barriers along the highway corridor in AutoCAD Civil 3D).
- (4) Phase 4, I worked on minor tasks for projects of Gloucestershire City Council (GCC) such as (a) swept path analysis for a few junctions (b) collating responses for comments by client on submitted design (c) TROs (Traffic Regulation Orders) & (d) assisting senior executives in preparing presentations for training sessions.

Tool used (Development tools - H/w, S/w): AutoCAD Civil 3D, AutoCAD 2D, MS Excel & MS Word.

Objectives of the project: 1. Prepare an optioneering report for Mid Wales Resurfacing Scheme 2. Complete RRRAP process for A465 project.

Major learning outcomes: (1) Exposure to the business and work culture of global design centers which deal with many foreign clients.

- (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.

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 (US, UK, Canada, Australia, Middle East, 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.
- (4) Clarity in terms of career goals: Companies invest heavily in freshers' training. Training programs can range from 4-6 months and continuous development is also taken care of in terms of licensure, etc. They try to minimize attrition right from the interview stage & filter out candidates with no interest in highway design or those who are not comfortable in learning CAD & BIM software as mentioned in (1).

Academic courses relevant to the project: (1) Highway Geometric Design (for design projects & junction improvement schemes) & (2) Pavement Management System (for maintenance projects).

Name: KIRAN GEORGE(2019H1300605H)

Student write-up

Short summary of work done during PS-II: The first live project at Atkins was consultation for central reservation vehicle restraint system improvement for various highways of east England for the client, Highways England. The team comprised of a project manager and engineers of various seniority collaborating with the Atkins UK team for the delivery of the project. The work included preparation of preliminary drawings and documents. The preferred option to carry out was replacement of existing VRS system on the highways which was at the end of its useful life cycle, and make changes in its layout where it did not comply to latest specifications. The major tasks to be carried out were collection of data such as flood events, visual inspection data of existing assets, accident data, traffic data etc. These were used to create the proposed layout in AutoCAD and deliver the technical documents associated with the work.

The second project assigned was to work with a team that delivers design for new layout for a section of a major trunk road in Wales and the junctions, slip roads, side roads and various other access tracks associated. I had to ensure passage of large design vehicles through these passages safely by using Autodesk vehicle tracking. Another major tasks involved was risk assessment of local roads to check for need of vehicle restraint systems. Checks had to be made on the VRS systems created to ensure the civil 3D models had the correct working widths, setbacks, foundation, transition lengths stipulated in the standards and if any sight distances of the vehicle was obstructed.

Tool used (Development tools - H/w, S/w): AutoCAD, Autodesk Civil 3D, Navisworks.

Objectives of the project: Delivery of drawings, reports and 3D models for clients.

Major learning outcomes: Vehicle restraint system standards UK, safety assessments for VRS, VRS corridor modeling in civil 3D.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: The Bengaluru office is the global design center for SNC Lavalin Atkins. The company follows a highly organized and efficient corporate culture. Due to the pandemic, work was entirely remote and company provided laptops and necessary peripherals. High speed internet is a necessity. The company systems were self explanatory, software licenses and services could be accessed upon request. A line manager was assigned to each of the interns, whom you can contact for

requests, applying leave etc. Corporate trainings were allotted and could be completed taking our own time. The interns will be assigned to different teams to carry out live projects. The team mates will give required guidance and supervise work. No formal training sessions were given for the software or the technical standards followed, but the seniors help out even during their busy schedules on a need to know basis.

Academic courses relevant to the project: Highway Geometric Design, Traffic Engineering and safety, Pavement Engineering.

Name: PRATIK VINODBHAI HARKHANI(2019H1430097H)

Student write-up

Short summary of work done during PS-II: The project comprised of Pier Impact Assessment for the highways England. Under bridge assessment team, eight bridge structures were calculate capacity of Pier in terms of bending, shear, torsion, overturning etc. in spreadsheet and categories according to British standard. Made approval in principal and technical note according to risk group. After finishing that, I was moved into Civil assessment framework agreement, I was given around 5 different type of bridges structure's desktop study detail in the form of Interim report.

Tool used (Development tools - H/w, S/w): LUSAS, Autodesk structural bridge design software, AutoCAD and STAAD, Pro CONNECT software, MS EXCEL.

Objectives of the project: To determine the load carrying capacity of existing bridges. Categorization of bridge support as per British standard. Assess the structure and provide suitable mitigation measures for defects.

Major learning outcomes: While proposing the analyses of structures, I was able to get familiarized with British standard. I learnt the process of assessment of existing post-tensioned bridges, determining defects, and proposing mitigation measures to increase the life of the

structure. I learnt to check the detailed drawings. This involved looking into British standard BS 5975, Indian standard IRC 87 and basic knowledge of the design of all structures apart from technical skills I learnt discipline, awareness about self-check, new software, workflow in companies, impact of these project on society, communication skills, etc.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The organization is involved in a wider range of works and the employees have good idea of various aspects of projects. The work environment is pretty amazing and interns are exposed to a wide range of international projects and can have really good work life balance. Beautiful environment for any curious mind. There's a plethora of knowledge and opportunity right in front of you, it's up to us what we wish to do with it. My seniors were welcoming and helpful. They steered me through this new phase. Guided me and helped me in adapting to this new work-life culture. I was overwhelmed with the interest showcased upon me, and on my skills and talents. ATKINS actually surpassed all my expectations. Overall, amazing experience and the journey continues.

Academic courses relevant to the project: Structural analysis, Advanced steel structures, Bridge engineering, Pre-stress concrete,etc.

Name: SHUKLA AAKASH AMIT(2019H1430101H)

Student write-up

Short summary of work done during PS-II: The work done consisted of assessment of bridges in the UK region. The assessment was done using MS excel. A spreadsheet specifically intended for assessment process was readily available. As an intern, I was trusted to populate the spreadsheets and compile the report for the same.

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

Objectives of the project: The project focuses on managing the load capacity of structures through structural assessment. Structural assessment is a form of structural analysis that uses the existing geometry, dimensions, material properties and contemporary condition of a structure to understand its load capacity. It forms part of the control barrier ‘Carry out structural assessment and implementations’ to prevent functional failure of the structure.

Major learning outcomes: Masonry arch bridges, metal bridges, concrete bridges, British standards, NR standards.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Working environment is keenly focused on progression with each passing day. As an intern, I was treated like a student and steadily moulded into an engineer. The company expects you to deliver the results over time and also trusts your judgement and decisions. I enjoyed my time as an intern because each senior was supportive and trusting the decisions and judgements I made as an engineer.

Academic courses relevant to the project: Structural analysis, Strength of materials, Bridge engineering.

Name: RAUT DARSHANA RUPRAO(2019H1430168H)

Student write-up

Short summary of work done during PS-II: 1. Pier Impact Assessment: Desktop study on available record data for classification in various groups for assessment, Excel sheet calculation as per DMRB code for bridges with different types of pier and top and bottom support condition. 2. CAFA: Database preparation for bridges to be assessed-collection of required information from websites and other standards for documentation purpose, documentation in assessment process- Approval in principle, assessment reports, grillage modelling in Lusas.

Tool used (Development tools - H/w, S/w): Autodesk structural bridge design software for axial & bending capacity estimation of piers, Excel sheet for determination of shear force and bending moment at top and bottom of Propped Cantilever Pier, Grillage analysis in Lusas software.

Objectives of the project: 1. Pier Impact Assessment: Assessment as per DMRB code for vehicular impact loading and prioritization based on containment level and provisions of CS 453. 2. Civil Assessment Framework & Agreement: Assessment of railway bridges as per network rail standards.

Major learning outcomes: Learnt about assessment procedure as per DMRB code for highway bridges and assessment of railway bridges as per network rail standards - Excel sheet calculations and software analysis, Capacity estimation through SAM software, Grillage modelling & FEA in Lusas software, also about advance excel commands in project management work.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: Working environment is very good in Atkins, Bangalore. Seniors will help whenever we get struck at some places or things where we don't have experience.

Academic courses relevant to the project: Bridge Engineering, Strength of Materials, Structural Analysis, Finite Element Analysis.

PS-II Station:Atkins, Gurgaon

Faculty

Name: Prof. Mahesh Kumar Hamirwasia

Student

Name: SACHIN KUMAR(2019H1300110P)

Student write-up

Short summary of work done during PS-II: Key task performed were 2D, 3D topo check, swept path analysis, Design Methodology, Delivery Tracker, Editorial & Editing.

Other Training:- Civil 3D, AutoCAD, InfraWorks, PDS Signs & Lines, ProjectWise & BIM Modelling.

Codal study:- Standard DMRB codes and other local transport codes.

Tool used (Development tools - H/w, S/w): Civil 3D, AutoCAD, ProjectWise, PDS Signs, InfraWorks.

Objectives of the project: Widening of Eastern Quadrant of Delme Roundabout to cater for the increased predicted flow of traffic. Introduction of a new westbound bus lane with a bus gate on the approach to the Delme roundabout for better and reduced traffic movement. Removing the uncontrolled crossing the east of Delme roundabout on Cams Hill due to safety constraints and providing a signalised crossing at Cams Hall Estate access along with proper signages and tactile paving. Removing the central reserve along A27 which will improve the traffic flow. Also proposing the signing strategy of the Existing ADs which were previously on the central reserve.

Major Learning Outcomes: Understood the guidelines for the standard practice adopted in the project. Reported the missing elements like a traffic sign, drainage gullies, lighting column and other utilities.

Learnt the standard utility naming conventions.

Checked the irregularities and undulation on the TOPO surface.

Analysis of slopes, contours, elevations, directions, watershed area, slope arrows.

Checked the design with a designated vehicle on any proposed ground.

Reverse direction movements using Auto drive.

Understood the monitoring process that how the task is timely managed, the points and surface definition, the alignment and profile creation as well as corridor model.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Great work culture and work life balance & great team to work with which helps me to enhance my skills in professional area. The company is already in the phase of digital transformation and I hope I will get some opportunity in this too.

Academic courses relevant to the project: Highway Geometric Design, Pavement material characterization, Traffic Engineering & safety.

Name: KRISHNAKANT SHARMA(2019H1430151P)

Student write-up

Short summary of work done during PS-II: Worked on various assessment projects as a part of CAT 2 check team, assessment included capacity checks, design checks, modelling and report preparation. Starting out with the extraction of section properties from the structural drawings and drafting the sections in AutoCAD and finally using them to model the spans in MIDAS followed by load application as per the DMRB codes and running the simulations.

After analysing the model, results were extracted for shear forces and bending moments at various critical locations. The next step was to determine the section capacities of all the structural elements and computing their utilization ratios and structural adequacy factors.

Thereafter, design checks were performed in accordance with BS 5400-3 and CS 456 such as stiffener checks, connections for deck checks in shearing and bearing and various other plate checks for eccentric moment as per SCI P358. Lastly, footway design was done using line beam model and all the SAFs were compared with the lead design team.

The next project was analysing the piers for collision loadings and checking the shear capacities with and without the shear links for the pier section.

Tool used (Development tools - H/w, S/w): LUSAS, MIDAS, AutoCAD, Excel Macros, NumPy.

Objectives of the project: To provide assessment and feasibility report as a CAT 2 check team

Major learning outcomes: Knowledge of various DMRB codes, LUSAS, MIDAS.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is employee friendly with optimal working hours and conditions.

Academic courses relevant to the project: Steel Design.

Name: KAMARIYA KEYUR RANCHHODBHAI(2019H1430611P)

Student write-up

Short summary of work done during PS-II: I completed hands on training of various software like MIDAS Civil, LUSAS, SAM etc. I was involved in project for assessment of capacity of structures like subways, culverts under the abnormal loads as per DMRB standards. Also, I was assigned a project of analysis and design of steel footbridge and prestressed concrete girders as per Eurocodes and DMRB codes.

Tool used (Development tools - H/w, S/w): Midas Civil, LUSAS, Autodesk structural bridge designer, Microsoft Excel.

Objectives of the project: 1. To check the capacity of structures under abnormal loads 2. To carry out capacity checks calculations of pre-tensioned composite girders as per DMRB codes using LUSAS software and Microsoft Excel3. To carry out analysis of steel footbridge using LUSAS and to check the capacity of steel truss members as per Eurocodes.

Major learning outcomes: 1. Grillage modelling through LUSAS software 2. Capacity checks using Autodesk Structural Bridge Designer (SAM) software 3. Assessment process for abnormal loading 4. Analysis of Arch bridge using MIDAS Civil software 5. Capacity checks of truss members using British standards6. Analysis of prestressed box girders using LUSAS software7. Knowledge of Eurocodes.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: First of all I would like to say that it was very smooth onboarding for me as an intern. It was really amazing experience to know about work culture and flow of any project in actual field work. I got very supportive team where it was easy to approach to line manager or others for any kind of technical or non-technical helps. I got a chance to work with senior level engineers on interesting projects which help me to improve my technical knowledge and hopefully I wish I could continue with this firm where I can contribute to variety of projects which would help me to grow as a technical expert in future.

Academic courses relevant to the project: Yes, following are the courses that I was offered in my Masters which really helps me a lot while dealing with any of technical field projects by simply applying the theoretical knowledge in practical terms. 1.Advanced structural analysis, 2.Advanced steel technology.

PS-II Station:Automat Irrigation Pvt. Ltd., Haridwar

Faculty

Name: Prof. Benu M Gedam

Student

Name: UTKARSH RASTOGI(2017A4PS0734H)

Student write-up

Short summary of work done during PS-II: Studied and worked on various topics regarding production planning and control like demand forecasting and study of applicability of different inventory models.

Cost study of different inventory models were done on a product and comparison of those models with current implementation.

Different demand forecasting models were studied to estimate demand for the upcoming quarter, one of those models implemented and automated using python scripts.

Tool used (Development tools - H/w, S/w): Python3, MS Excel.

Objectives of the project: 1. Automate the production plan using sales data by demand forecasting 2. Study and compare the possibility of implementation of various inventory models.

Major learning outcomes: Learnt how a large scale factory operates, and how role of ppc in making that operation smooth and efficient.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment was highly non-intrusive, we were free to do the project our way and the progress was communicated via weekly review meets. All decisions and responsibilities regarding the project was ours.

Academic courses relevant to the project: Production planning and control, Engineering optimizations, Supply chain management, Python programming.

Name: KUSHAGRA KULSHRESTHA(2017ABPS0996P)

Student write-up

Short summary of work done during PS-II: The PS-II primarily focused on the process of Butterfly valve assembly line time study and product development of the Automated Screen Filter (ASF). Product development is the complete process of delivering a new product or improving an existing one for customers. In the case of this report the latter is true for the ASF. Time study in the context of this report can be defined as a structured process of directly observing and measuring assembly line functioning using a timing device to establish the time required for completion of the work by an assembly line station when working at a defined level of performance(quality of assembly).

Tool used (Development tools - H/w, S/w): Arduino Nano, Arduino IDE, STM-32 ST-Link Utility, TinkerCAD, STM-32 Cube IDE, STM-32 Cube MX, STM-32 Cube Programer, STM32F103C8T6 Development Board, Breadboard, ASF Filter Prototype, DC Motor, Jumper Cables, JX-FRON-V4L7 Optocoupler 4 Channel 5v Relay Module Controller.

Objectives of the project: Butterfly valve assembly line time study and product development of the ASF.

Major learning outcomes: Project management , Micro-controller programming.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Even though disruptions due to sudden surge in Covid cases did slow the project progress there was ample support provided by the station mentors. I would recommend the students propose a project and work (together with other students if possible) since, the company is very receptive towards the same.

Academic courses relevant to the project: Mechatronics, Reverse Engineering and Rapid Prototyping.

Name: JOEL KUNDU(2017ABPS1399H)

Student write-up

Short summary of work done during PS-II: A literature review was done about machine learning applications in moulding machine parameter predictions. Based on the articles, an algorithm was designed and tested on simulated data first. I then compiled a new dataset with data aggregated from real moulds. Following this, I designed a machine learning pipeline, trained and tested it on the new dataset. Satisfied with the performance, I designed a GUI to simplify the usage of the program.

Tool used (Development tools - H/w, S/w): Python, HTML, Css, Flask, Scikit-Learn, PyFlaDesk, SQLAlchemy, WTForms, Markdown2, Bcrypt, PyCharm IDE, SolidWorks Plastics, SolidWorks, Microsoft Office Suite.

Objectives of the project: The objective of the project was to reduce the manual effort involved and the raw material wastage that occurs during the experimental process of determining optimal moulding machine parameters for any new mould. The goal was to create a system that would be able to predict the optimal parameters using a machine learning model.

Major learning outcomes: During the course of the project, I learnt the process of designing solutions based on machine learning. I got familiar with Python programming language and the Scikit-learn ML framework. The process of curating the datasets to train the ML model has allowed me to comprehend the injection moulding process of creating plastic parts. I also learnt the Flask framework which has been used to create the GUI interface of the program.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is very good and the staff is very helpful. The company allowed us to choose our own projects based on our interests and had been supportive throughout the process of

completing my projects. There had been no restrictions placed on us and we were allowed to deeply engage and understand the organization's various processes and assembly lines.

Academic courses relevant to the project: Machine Learning and Material Sciences.

PS-II Station:Avaamo, Bangalore

Faculty

Name: Prof. Anita Ramachandran

Student

Name: SURYATEJA RATAKUMTLA(2017A7PS0113G)

Student write-up

Short summary of work done during PS-II: I worked in developing a basic level NodeJs application to testing a new feature. For the rest of my duration at Avaamo, which contributes to majority of work, I was fixing the bugs raised by the QA while testingthe platform product they provide. Working bugs helped me get to know about their tech stack and development environment. I worked on Ruby on rails, Angular framework, MySQL (little bit).

Tool used (Development tools - H/w, S/w): Apple macbook Pro, VSCode, Rails, MySQL workbench, Angular, Docker, iterm, Gitlab, Git.

Objectives of the project: To build testing tool to help QA test one of the new features for 5.7.0 release. And to fix bugs relating to frontend, backend, DB raised by QA team while testing 5.7.0 release.

Major learning outcomes: Building web application using Ruby on Rails, Angular, MySQL. Building another web application using ExpressJS(nodeJS). Version controlling code repo in dev environment using Git.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Colleagues are very helping at the beginning and throughout.

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

PS-II Station:Bambinos Learning Solutions Pvt. Ltd., Bangalore

Faculty

Name: Prof. Akanksha Bharadwaj

Student

Name: KAPIL GUPTA(2016B2AB0836P)

Student write-up

Short summary of work done during PS-II: My work at Bambinos was not in form of a single project but a combination of multiple projects. Bambinos is an early-stage start-up and is in the rapid growth phase. Bambinos addresses the growing needs of kids 4-15 years of the age group for various after-school classes (extracurricular activities) like art and craft, dance, Bhagavad-Gita, public speaking, chess, and many more. Following are the main projects that I have worked on:

- a) Finding the interactive tools for teachers, which will be used by them to increase their

- teaching efficiency.
- b) Designing the chess curriculum for beginners where age ranges from 6-13.
 - c) Taught a demo class (free for anyone) for chess beginners.
 - d) Designing the chess curriculum for intermediate players.
 - e) Hiring teachers for the beginner chess curriculum.
 - f) Watching recorded class sessions.

Tool used (Development tools - H/w, S/w): Here are some main tools that I have worked with:

- 1. Analysis board at chess.com - for teaching
- 2. Gimkit.com - for creating quizzes
- 3. Whiteboard.fi
- 4. Whiteboard.chat
- 5. Kahoot
- 6. Proprofs
- 7. Google jamboard - for creating flowcharts
- 8. GoConqr
- 9. Quizm.

Objectives of the project: All of the projects completed by me are done with a vision to make children future-ready and help them to explore their true potential. By improving the interactive tools used by teachers, the online teaching mode for students will go a long way.

Major learning outcomes: I had great learning opportunities in Bambinos learning solutions. First of all, I learnt various chess concepts to create the curriculum. Apart from learning how to create a curriculum, I also got an opportunity for teaching a demo class. That was a great learning experience. The content of that demo class was good but the class went a little slow. I took more than 1 hour for a 45 minutes class. Apart from that, I helped the kids in understanding the concepts easily. From my interactive tools search, I learnt about various tools, about their features and definitely this will help me in future. Overall, this experience has provided me the complete knowledge of early growth startups, the challenges involved and strategies to overcome them.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: As Bambinos is a startup, there are not a lot of seniors. Mainly, it was filled with interns like us. All of the colleagues and rest of the staff are very supportive and helpful. My mentors are the founders of Bambinos. They really helped me a lot in every way. I was directly working with them.

Academic courses relevant to the project: Creative Thinking, Thesis.

PS-II Station:Bharat Forge Ltd., Pune

Faculty

Name: Prof. Naga Vamsi Krishna Jasti

Student

Name: ROHAAN GEORGE THOMAS(2019H1420136P)

Student write-up

Short summary of work done during PS-II: I was assigned to Kalyani Centre for Technology & Innovation (KCTI), the R&D center of Bharat Forge. KCTI has 3 testing laboratories:

1. Mechanical Testing Lab
2. Corrosion & Surface Engineering Lab
3. Metallography and Scanning Electron Microscopy (SEM) Lab

Initially, customers of KCTI had to submit a filled physical requisition form that has the list of all tests that can be performed in the labs of KCTI. Test reports were generated and stored in PCs of labs. My project was to develop a laboratory information management system (LIMS) for KCTI so that the labs can function more efficiently.

The developed LIMS had two elements:

1. An online web application form that customers can fill and submit to receive a slot timing in which tests would be conducted.
2. An information dashboard for the labs to view and update the status of the requests made by the customers.

Tool used (Development tools - H/w, S/w): HTML, CSS, Bootstrap, JavaScript, Unix Command Line, Node.js, Express.js, Github, MongoDB, Mongoose, React.js, Heroku, Mongo Atlas.

Objectives of the project: Develop a Laboratory Information Management System (LIMS) for all testing labs in KCTI, Bharat Forge.

Major learning outcomes: Through the project on web development (front-end and back-end development), learnt:

1. About web development fundamentals.
2. To create forms using HTML.
3. To use Cascading Styling Sheets (CSS) to beautify the form developed using HTML.
4. To use Bootstrap that makes form design and information dashboard design easier.
5. JavaScript to script logic into web app.
6. Version control using Git and Github.
7. Node.js framework.
8. Express.js.
9. React.js framework.
10. Database management using MongoDB and Mongoose.
11. To deploy web app using Heroku.
12. To deploy databases with Mongo Atlas.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: PS-II at Bharat Forge was conducted in WFH pattern in accordance with COVID protocol imposed at the company. Status meetings were conducted once every week to discuss the progress made so far and the problems faced while meeting the objectives. Software development was a new field for me, and all faculties were very supportive throughout the project.

Academic courses relevant to the project: The Complete 2021 Web Development Bootcamp' by Dr. Angela Yu, available in Udemy.

PS-II Station:BITMAPPER, Pune

Faculty

Name: Prof. Manoj Subhash Kakade

Student

Name: CHETAN KUMAR GUPTA(2019H1230544P)

Student write-up

Short summary of work done during PS-II: A PCB system design of a USB HUB system that consist total 27 port. This USB HUB system is capable of Apple charging and Samsung charging support. This USB HUB system is software capable to control on/off port. In this project, the whole design is prepared first and an architecture is also prepared. Total 9 USB HUBs are connected in particular architecture. Testing work is also done for this project, API is also tested on this Hardware.

Tool used (Development tools - H/w, S/w): Xilinx Vivado, Cadence Allegro, Cypress Blaster Plus Tool.

Objectives of the project: This USB HUB system is used to connect several USB devices for charging and data transfer.

Major learning outcomes: PCB Designing Flow, Testing of PCB Boards.

Details of papers/patents: N.A

Brief description of working environment, expectations from the company: This company environment is good and their work is also good. Basically work is dependent on PCB Board Designing, Embedded System Designing, they also work for FPGA Designing.Their work is

depend on critical electronic development, verification, integration, prototyping and manufacturing.

Academic courses relevant to the project: PCB Designing, FPGA Designing and Synthesis, Embedded System Designing.

Name: ANSHUMAN RAY(2019H1400077G)

Student write-up

Short summary of work done during PS-II: Our project focused on capturing MIPI CSI RAW 10 video data from the camera module and then use video processing IP to process the received data from the camera module into parallel video format more likely RGB format and then convert the RGB data or the parallel data into UDP packets which contains the MAC address of the destination and the source address along with Data which is given to UDP_PACK_GEN module through a FIFO IP whose depth depends upon the MIPI CSI data lane no's i.e. FIFO depth is proportional to Bandwidth of data received, FIFO data which in turn is sent to the UDP_PACK_GEN module one by one to check whether it is generating UDP streams i.e Standards specified. and it is sent over the AXI bus to the tri-mode Ethernet IP to the slave machine for visualization, Here Micro blaze processor is used to controlling all the data and instruction flow.

Tool used (Development tools - H/w, S/w): Xilinx Vivado, vitis, petalinux.

Objectives of the project: To stream video data captured, to ethernet.

Major learning outcomes: FPGA design, Camera interface protocol (CSI), Peta-linux image creation for OS building, Key IP's-its functions used for the project.

Details of papers/patents: MIPI RX subsystem controller IP user guide.

Brief description of working environment, expectations from the company: Working environment at company was calm and positive. Both positive and productive atmosphere encouraged me to understand the subject matter, helping me relating my course work at BITS and the company project, even the team members were very compassionate in helping me finding the problem, my manager was a very kind hearted person who helped me a lot, gave me enough time to acknowledge my errors. I learnt a lot more than what I thought and this will definitely help me build my career.

Academic courses relevant to the project: Reconfigurable Computing, Hardware-Software co-design.

PS-II Station:Blue Jeans Network India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Akanksha Bharadwaj

Student

Name: LAVANAY THAKRAL(2016B5A70566G)

Student write-up

Short summary of work done during PS-II: Every few days, a new issue is assigned to us on Jira. The development is in C, C++. This issue could be a feature addition, task, bug etc.

Tool used (Development tools - H/w, S/w): Jira, Git, Jenkins, C, C++, VScode.

Objectives of the project: To improve and maintain the fiber SDK, which lies below the app layer and above the server layer.

Major learning outcomes: Agile development, best coding practices, Git, software development.

Details of papers/patents: None

Brief description of working environment, expectations from the company: I expected the environment would be team dependent. The fiber team follows agile development practices and always has 15 day ongoing sprints. There is a daily 30 min scrum meeting where you have to update about what you did in the last 24 hours. In that context, it becomes quite fast paced where we need to have real updates everyday. The work is core backend software development in C and C++. The work is interesting and deals with advanced concepts of networks. There is a lot to learn, and grow as a developer here. At times there is a lot of work, and things become hectic.

Academic courses relevant to the project: Operating System, Computer Networks.

Name: S HARIHARAN(2017A7PS0134P)

Student write-up

Short summary of work done during PS-II: Working with the backend team that handles the core out of meeting business logic. Work was majorly around building, testing, and deploying RESTful APIs. In addition, there was work involving writing scripts (preferably in a scripting language like Python) that would be run ad-hoc when the administrators of different enterprises request certain services to be performed. And there was also some develops type work involving creating new virtual development machines.

Tool used (Development tools - H/w, S/w): Git, REST, Java, Spring, CI/CD (Jenkins), Python.

Objectives of the project: Developing RESTful APIs, creating scripts.

Major learning outcomes: Excellent exposure to Spring (using Java) and good API design. Good learning experience with other development tools such as Git for version control, Jenkins for CI/CD, and various databases including relational and NoSQL. A bit of exposure to various AWS services as well for cloud based architectures.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is fast paced, and team dependent. Some teams follow development cycles involving major releases while other teams work with the typical agile sprint methods. Expectations from the company would be mostly just quickly learning and adapting to their infrastructure, and creating quality code.

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

PS-II Station:Blue Yonder (JDA), Bangalore

Faculty

Name: Prof. Vineet Kumar Garg

Student

Name: DHANUSH TRIPATHY(2016B5A40714P)

Student write-up

Short summary of work done during PS-II: Data Doctor is a data cleansing software that classifies the data records with errors from the certified ones based on a set of validation

checks. The work in the internship was mainly geared towards making various modules for Data Doctor so as to improve the functionalities and performance of the software. The code of the summary generation program was optimized, which lead to an 80% decrease in its processing time. Made two new validation checks in the data cleansing software that ascertains validity of a given transaction by making use of Spark SQL queries to contrast the date time values and id with the active date range values stored in the database.

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

Objectives of the project: Creation of modules for Data Doctor, to improve it's functionalities and performance.

Major learning outcomes: Python, Application development, SQL, Automation, Apache spark, Data pipelines, Data analytics.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Managers and mentors were very helpful and provided plentiful guidance. The working environment was encouraging and positive.

Academic courses relevant to the project: Courses related to Python and SQL.

PS-II Station:BNY Mellon Technology, Pune

Faculty

Name: Prof. Sonika Chandrakant Rathi

Student

Name: E MADHU BHARGAVA(2019H1030504H)

Student write-up

Short summary of work done during PS-II: The organisation is in a transition phase where they are shifting from a legacy codebase to adhere latest industry standards. This provided me wonderful opportunity to be a part of project right from it's inception which provided valuable insights about software engineering in general.

Tool used (Development tools - H/w, S/w): Spring framework, primarily Spring Boot and Spring Cloud group of projects.

Objectives of the project: Transitioning from a monolith architecture to microservices based architecture.

Major learning outcomes: Learnt about microservices architecture, API first approach, securing microservices.

Details of papers/patents: None.

Brief description of working environment, expectations from the company: The work culture is really good. My manager, mentor and all the colleagues were supportive enough.

Academic courses relevant to the project: Object Oriented Analysis and Design, Distributed Data Systems, Cloud Computing, Network Security, Database Systems.

PS-II Station:BSCPL Infrastructure Ltd., Hyderabad

Faculty

Name: Prof. Mahesh Kumar Hamirwasia

Student

Name: GIRDHARI AGRAWAL(2019H1300107P)

Student write-up

Short summary of work done during PS-II: I was stationed as site engineer in the beginning and was responsible for the supervision and execution of different work process on site, later we worked from office and learnt about report making and other administrative and engineering works.

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

Objectives of the project: To widen and construct the NH63 from Hubli to Hospete section.

Major learning outcomes: Field strategies and techniques involved in the construction process of highways.

Major machineries purposes involved in this construction process.

Drawing study, execution and implementation of drawings to practical works.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Company shares a good working environment and there is no restriction when it comes to communicating with peoples at different levels involved in the company. Employee in every level are treated as equal and is very friendly working environment.

Academic courses relevant to the project: Pavement Rehabilitation and Pavement Materials.

PS-II Station:Capgemini Technology Services India Pvt. Ltd., Gurgaon

Faculty

Name: Prof. Nishit Narang

Brief write-up on PS-II station : While our PS-II students are normally well equipped w.r.t technical skills and theoretical fundamentals, there is a need to be better equipped on some of the soft skills. In the Industry, projects are executed as a Team and not as an Individual. Hence, Teamwork is utmost important. This cannot be achieved without proper project management practices, including following all status reporting and communication practices and demonstrating a proactive approach. Many students lag on this aspect. Hence, a specific course on Project Management practices to educate PS-II students on the key practices and procedures are necessary, especially during the Work-From-Home (WFH) period.

Student

Name: ALOK AYACHIT(2019H1490808P)

Student write-up

Short summary of work done during PS-II: During my tenure with Capgemini Invent as an intern, I was involved in tasks related to innovation and strategy. My work comprised of:

1. Designing innovation programs for the client. This involved the use of design thinking concepts.
2. Working on number crunching and data analysis to aid the company's strategy building process.
3. Curating promotional content for flyers designed to promote webinars within the company.

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

Objectives of the project: 1. To develop innovation programs for the client 2. To build staffing strategies for the client.

- Major learning outcomes:** 1. The importance of packaging ideas into appealing presentations.
2. Drawing favorable statistical inferences from data.
3. Learning how strategies are formulated by a company.
4. Application of design thinking concepts in the corporate world.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment at Capgemini was an encouraging one. My manager was approachable and willing to help as and when required. From a management intern's perspective, I was able to get an overview of how consulting works. On the work front, sufficient creative freedom was allowed to approach a problem and come up with a solution. I learnt how to create aesthetically appealing presentations using PowerPoint. The company met most of my expectations. It was particular in providing all material necessary for the internship. Overall, an enriching experience.

Academic courses relevant to the project: Business Policy and Strategic Management, Design Thinking and Marketing.

PS-II Station:Capillary Technologies, Bangalore

Faculty

Name: Prof. Uma Maheswari Natarajan

Student

Name: SREELAKSHMI K K(2018H1030130P)

Student write-up

Short summary of work done during PS-II: Worked on live projects dealing with Gateway Integration and Omni-Channel CRM software fixes. Got an opportunity to work on back-end development in the Engage plus team that deals with Omni-channel Campaign Management. Worked with API testing and deployment tools. Got practical experience of object oriented programming technologies and how various design patterns are utilised in production software.

Tool used (Development tools - H/w, S/w): IntelliJ, PhpMyAdmin, Vagrant box, Git, Company's internal testing and deployment tools.

Objectives of the project: Add a new gateway implementation to provide support for transactional SMS flow for capillary's client Petron.

Major learning outcomes: Development, Quality Assessment, Testing, Deployment and Release of a feature in live environment.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Good working environment, very supportive team that helps anyone with a keen interest to grow and advance in back-end coding.

Academic courses relevant to the project: Object-Oriented Analysis and Design, Software Testing Methods, Software Engineering, DBMS, Object-Oriented Programming.

Name: PRATEEK ISHWAR KHADE(2019H1120180P)

Student write-up

Short summary of work done during PS-II: I was part of Loyalty development team which is responsible for the Capillary's Loyalty program software. The work I involved was mostly related to new feature development or the back-end changes required for the bug fixes. So, the usual

process is product management team, comes up with the requirements for new feature/functionality related to loyalty platform. Our task was to understand the requirements, detail out the changes required to meet the requirements and get it reviewed with rest of the team for suggestions. Once the detailing is reviewed, we can start the development on it. Other than this, we also worked on various bug fixes reported by clients or QA. As part of the loyalty development team, the technologies we majorly work on are JAVA Spring framework, Apache Thrift, PHP, MongoDB, MySQL, Hibernate.

Tool used (Development tools - H/w, S/w): IntelliJ IDE, Postman, phpStorm IDE, GIT, MySQL, MongoDB, Apache Thrift.

Objectives of the project: Product Enhancement, Bug Fixes, Addition of New Feature.

Major learning outcomes: Spring framework, Hibernate, REST APIs, Working and understanding of various version control tools, company standard coding style.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is very good, team members are helpful and are available for clearing any doubts or giving knowledge transfer session. Prior knowledge of GIT, Spring framework would be helpful else you are given decent amount of time to learn those on the go, while working on the task.

Academic courses relevant to the project: Object Oriented Programming, DBMS, DSA.

PS-II Station: CASHe, Hyderabad

Faculty

Name: Prof. VijayaLakshmi Anand

Student

Name: KESIM SETTY RAM TARUN(2017AAPS0349H)

Student write-up

Short summary of work done during PS-II: Initially worked on creating indexes and dashboards in elastic search using Kibana, later worked on upgradation of elastic search to latest versions.

Tool used (Development tools - H/w, S/w): Elastic Search, Kibana, Postman.

Objectives of the project: Elastic Search Maintenance & Upgradation.

Major learning outcomes: Software Maintenance.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Friendly organizational culture. It has been a great learning opportunity and got exposure to different technologies and domains.

Academic courses relevant to the project: No

PS-II Station:CEG Ltd., Jaipur

Faculty

Name: Prof. Samata Mujumdar

Student

Name: NAYAN GADE(2019H1300579P)

Student write-up

Short summary of work done during PS-II: It was very good experience with the team at CEG. As a transportation trainee I worked on drainage design for the road, preparation of road marking schedule for highway and runway pavement design. I also got conversed with the Bentley OpenRoads software using which we design the horizontal and vertical profile for the road.

Tool used (Development tools - H/w, S/w): Bentley OpenRoads, FAARFIELD 2.0, IIT Pave, MS Excel.

Objectives of the project: To learn various industrial aspects of transportation engineering.

Major learning outcomes: Practical application of theoretical concepts.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was very good learning environment there and all the mentors were very helpful.

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

Name: RAHUL AGGARWAL(2019H1430096H)

Student write-up

Short summary of work done during PS-II: Prepared Design Spreadsheet for Bowstring Type Steel Arch Superstructure.

Completed Design of 65m BMRCL Metro Steel Truss type superstructure with steel composite bridge deck as per IRS Bridge Rules, IRS-SBC, IRS-CBC, IRS-22:2015, RDSO guidelines, SOD draft given by BMRCL.

Completed Delhi Vadodara: P30 – 62m Design of Steel Truss type superstructure with steel composite bridge deck design as per IRC- 24:2010, IRC-22:2015, IRC-6:2017, IRC112:2019.

Worked on design of different types of slender cross-sections for steel plated structures & composite bridges as per Eurocodes i.e. (EN 1993 Part 1-1, Part 1-5, Part 2 & EN 1994 Part 1-1, Part 2).

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

Objectives of the project: Study of previously executed projects where the design methodology can be broken down into numerical order. Along with this, collection & study of relevant literature from references, Indian & International codes is undertaken from which design philosophy can be backed. Following the appropriate and stream-lined work, design excel sheets have been prepared for calculation & analysis part is done in Staad-Pro for the design take-off.

Major learning outcomes: Learnt design of Steel Truss (Both Highway & Railway) & Bowstring Arch Type Bridges along with composite deck slab design.

Details of papers/patents: NIL

Brief description of working environment, expectations from the company: Seniors guiding here were cooperative and helped at every step.

Academic courses relevant to the project: Structural Analysis, Design of Steel Structures, Bridge Engineering.

PS-II Station:CEG Test House & Research Centre Pvt. Ltd., Jaipur

Faculty

Name: Prof. Samata Satish Mujumdar

Student

Name: AYUSH AGARWAL(2019H1470185P)

Student write-up

Short summary of work done during PS-II: The project allotted was method development and validation of pharmaceutical product as per ICH guidelines. There were lots of government sample in the company for which in-house STP method was present. Since, there was no any other method development facility in the company so the primary aim was to validate the method that was present. Various parameters for method validation has been done which includes linearity, accuracy, system precision, robustness, specificity etc. in HPLC. Throughout the project also I came through various handling of equipment like HPLC, FT-IR, UV, Polarimeter etc. Also a good experienced has gained regarding documentation related work.

Tool used (Development tools - H/w, S/w): HPLC, FT-IR, UV, Polarimeter, Universal testing Machine, Tensile Testing Machine, Karl- Fischer Titrator.

Objectives of the project: The project aimed at developing the method and validates it as per ICH guidelines for various pharmaceutical products.

Major learning outcomes: How to do method validation, hands on experience on various equipment's, knowledge gain for QA related word.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working culture in the company was good. The people were friendly and were of helping nature.

Academic courses relevant to the project: IMA(Instrumental method of Analysis), QARA(Quality Assurance And Regulatory Affairs) were very much relevant to the project.

Name: SHARMA DHAIRY DIPAKBHAI(2019H1470634P)

Student write-up

Short summary of work done during PS-II: At CEG, I worked on the project "Analytical method development and validation of pharmaceutical products". During this time period, I validated the in house assay method for identification of Aceclofenac and Paracetamol in Aceclofenac(100mg) & Paracetamol(325mg) tablet IP using HPLC. In compliance with ICH Q2 r1 guidelines parameters like specificity, system suitability, method precision, linearity, accuracy, robustness, etc was validated.

Tool used (Development tools - H/w, S/w): HPLC, pH meter, Chromeleon Chromatography Data System (CDS) software, etc

Objectives of the project: Validation of assay protocol used for identification of Aceclofenac and Paracetamol in Aceclofenac & Paracetamol tablet IP.

Major learning outcomes: 1) How to operate HPLC and other instruments which was there in the lab2) How to prepare dilutions (ppm)3) How to coordinate with colleagues and work efficiently4) Estimate and deliver the work on time.

Details of papers/patents: No

Brief description of working environment, expectations from the company: Working environment was professional as expected. People who are working in the lab are very kind and

helpful. It was a great opportunity to learn technical as well as professional skills which going to be very helpful for my career.

Academic courses relevant to the project: Pharmaceutical Chemistry.

PS-II Station:Central Leather Research Institute (CLRI), Chennai

Faculty

Name: Prof. Samir Kale

Student

Name: SAIPRASAD GOCHHAYAT(2017A1PS1147H)

Student write-up

Short summary of work done during PS-II: Worked on a biomaterial based project, where I was tasked with making dry packaging material from waste extracted gelatin. Worked with 3 different kinds of hydrolysis to fabricate cellulose nano crystals, and used them as a blend in the gelatinous film. Characterised for structure property correlations.

Tool used (Development tools - H/w, S/w): XRD, SEM, FTIR, UV Vis, wet lab techniques.

Objectives of the project: Product development for packaging. Could extrapolate products for biodegradable PCB applications.

Major learning outcomes: Structure property correlations, product development.

Details of papers/patents: One in communication

Brief description of working environment, expectations from the company: Excellent working environment. Adequate lab space and good learning experience.

Academic courses relevant to the project: Materials characterisation, polymer chemistry, material processing.

Name: BHAWANA AGARWAL(2017A1PS1321H)

Student write-up

Short summary of work done during PS-II: It is always better to prevent pollution rather than processing waste. Tannery waste contains many different chemicals which are the major cause of pollution. A lot of work has been done to reduce the chemical output till the chrome tanning process. Post tanning requires the use of a combination of chemicals like syntans (synthetic tanning agents), fat liquors and dyes. To minimize these chemicals in the waste water, one needs to understand its uptake by the leather. Exhaustion studies of these chemicals is a difficult process since it requires a characterization method to accurately detect the quantities at various steps. These chemicals are bought from the industry and are complex mixtures whose content is unknown. This causes a setback in the characterization of such substances and therefore in the study of their exhaustion in the leather retanning process.

Tool used (Development tools - H/w, S/w): Ultraviolet- Visible Spectroscopy, FTIR, Zeta Sizer, Tannery drums, Origin, Hot air oven, Sonicator.

Objectives of the project: Characterization of complex mixtures and the experimental quantification of exhaustion of syntans and fat liquors in leather retanning.

Major learning outcomes: TS/TDS/ TSS studies, connecting the experimental results to different theories and conclude on the efficacy of a hypothesis. Hands on experience in using characterization techniques such as zeta sizer, UV spectrophotometer, FTIR.

Details of papers/patents: Post tanning in leather processing: A review- Yet to be submitted.

Brief description of working environment, expectations from the company: The work environment is quite comfortable and well organized to work in and the people are extremely friendly and helpful. All the labs are well equipped although most of the characterization techniques are extremely difficult to work on schedule. The research projects are very interesting although one would like to make sure the project assigned to you is related to your field or it gets a bit difficult to cope up. As expected some of the scientists were extremely well versed with their subjects and you can learn a lot from them.

Academic courses relevant to the project: Materials Characterization, Environmental Pollution Control, Chemistry Laboratory, Materials Science, General Chemistry, Materials Processing, Polymer Chemistry, CEL Lab 1 , CEL Lab 2, Separation process.

Name: PRIYANKA GOYAL(2017A1PS1605H)

Student write-up

Short summary of work done during PS-II: Starch was extracted from longan seeds. The starch was characterized for functional properties and proximate analysis. The starch was oxidized to obtain dialdehyde starch. Both the starch and dialdehyde starch were characterized for structural properties, functional groups and morphology. Collagen was extracted from rat tail tendons and characterized for purity and concentration. The collagen was stabilized using the dialdehyde starch and tested for biocompatibility.

Tool used (Development tools - H/w, S/w): UV Spectrophotometer, DLS, NMR, XRD, DSC, TGA, SEM, AFM, AT-IR, CHNSO, MALDI, Centrifuge.

Objectives of the project: To extract starch from novel carbohydrate source and oxidize the starch to obtain dialdehyde starch to act as crosslinkers for the stabilization of collagen. The ultimate stabilized collagen is anticipated to be bio-compatible and is to be tested for tissue engineering application.

Major learning outcomes: Materials science, Materials characterization, Biopolymers, Bio-applications.

Details of papers/patents: Research paper to be written on the mentioned area.

Brief description of working environment, expectations from the company: A comfortable work environment with good hands-on-work and proper laboratory based research experience. Mentor, Ph.D scholar and all lab mates are very friendly and helpful. The lab is well-equipped with all required equipment. Independent projects are encouraged and interns are motivated to perform well with good outcomes. A well-equipped lab with good hands-on learning was expected from the PS-station.

Academic courses relevant to the project: General biology, Materials science and engineering, Materials characterization, Materials processing, CEL-1, CEL-2, Polymer chemistry, Separation process, Environment pollution and control, Engineering chemistry.

Name: CHANDRANANTHI C(2019H1290103P)

Student write-up

Short summary of work done during PS-II: Diabetes mellitus is a metabolic disease and is becoming an epidemic in many parts of the world. Diabetes results in rise in blood glucose levels caused by defects in insulin action, secretion, or both. This rise in blood glucose levels results in the formation of advanced glycation end products (AGEs), which are major cause for the development of diabetic complications like diabetic retinopathy, neuropathy and cardiomyopathy. There are speculations about diabetes being a generational disease based on some pedigree studies, meaning that diabetes in parents can have effects on successive generation individuals. But till date, there are no detailed studies which covers this aspect. Thus, through this study, we address if high glucose stress given to parental generation can have effects on subsequent two generations in terms of their AGEs levels. In addition to this, I was

also checking if an antiglycation agent, carnosine can combat the effects caused by high glucose stress in subsequent generations. *Candida elegans* was used as the model organism for all the studies. As the hyperglycemic state observed in diabetic patients can be mimicked in *C. elegans*, it is considered as one of the ideal models for diabetes related studies.

Tool used (Development tools - H/w, S/w): OriginPro 9.0, Fluorescence spectroscopy, FT-IR, ELISA.

Objectives of the project: To evaluate the effect of high glucose stress on AGEs levels in *C. elegans*. To check for AGE levels in the subsequent generation worms upon glucose stress to the parental generation. To evaluate the impact of an antiglycation agent on AGEs levels of glucose stressed worms.

Major learning outcomes: Learnt the handling and maintenance of model organism, *C. elegans*. Learnt about planning and designing of the experiments as well as the operation of various instruments.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The PS at CLRI was a good learning experience. The positive work environment helped me perform better. The working environment was very friendly and open for discussion and learning. There was no work pressure as such and review meeting was held at a monthly basis to update the status of our work.

Academic courses relevant to the project: Advanced cellular and molecular biology, Genetic engineering techniques, Experimental techniques, Research project.

Name: NIRANJANA SREEKUMAR(2019H1290569P)

Student write-up

Short summary of work done during PS-II: The main objective of my study was to synthesize small organic molecules which could be used as Chemosensor for the identification of heavy metal contamination in environmental and biological samples. Design and synthesis of a Fluorescent Chemosensor that is highly selective and sensitive is expected to be a rapid and a highly effective method in detecting heavy metal contamination in the environment.

Tool used (Development tools - H/w, S/w): UV-Visible Spectrometry, Fluorescent Spectrometry, ESI-Mass Spectrometry, FTIR, NMR, MTT Assay, Confocal Microscopy.

Objectives of the project: 1)To synthesize a novel Chemosensor(Probe), and use it for the selective detection of Chromium ions in environmental and biological samples 2) To optimize solvent ratio and time of detection of the Chemosensor. Further to estimate the Limit of Detection(LOD) of the synthesized Chemosensor for the selective detection of chromium ions 3) To evaluate the Chemosensor's activity in real environmental and biological samples. Also, to monitor the biocompatibility of the probe using MTT Assay and cell imaging studies.

Major learning outcomes: Synthesis and extraction of organic compounds. I learnt the main analytical techniques used to characterize the Chemosensor and to plot and analyze the data using OriginPro9.0 software.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment in my laboratory was extremely student friendly. The research scholars and the other technical staff were very supportive and guided me in every step of the project. Having a background in biotechnology, my professor and other students of the lab helped me understand the concepts in chemistry, which helped me finish my project well and made my tenure in the lab a fruitful one.

Academic courses relevant to the project: Environmental Biotechnology

Name: ILA MILIND SARODE(2019H1460166P)

Student write-up

Short summary of work done during PS-II: I worked on multi-functionalized silver nanoparticles for inhibition of protein fibrils. Insoluble protein aggregates are responsible for causing disorders including Type II diabetes, Alzheimer's disease, Parkinson's disease, and Huntington's disease. Small molecules that inhibit protein fibrils are required in high concentration and cause toxicity. We investigated the effect of multi-functionalized silver nanoparticles to inhibit bovine serum albumin as a model protein. The nanoparticles were synthesized and evaluated for FTIR, UV-Spectroscopy and inhibition studies.

Tool used (Development tools - H/w, S/w): UV-Spectrophotometer, FT-IR, Fluorescence Spectrophotometer.

Objectives of the project: To enhance the efficacy by multi-functionalizing silver nanoparticles to inhibit protein fibrils.

Major learning outcomes: It gave me a systematic approach on how to work on project. It enhanced my technical skills and made me learnt things helpful to develop my personality.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Good working environment.

Academic courses relevant to the project: Pharmaceutics, Pharmaceutical analysis, Organic chemistry.

Name: MADAMSHETTI SNEHA(2019H1460170H)

Student write-up

Short summary of work done during PS-II: Development of bio ink by collagen for developing artificial living tissues and scaffolds using 3D bioprinting.

Tool used (Development tools - H/w, S/w): Contact angle meter, NMR, Mass spectroscopy, DSC, FTIR, TGA, SEM.

Objectives of the project: To reduce the cost of bio ink by developing from collagen extracted from rat tail so that it will be available for every one in developing artificial scaffolds or tissues.

Major learning outcomes: Hands on experience in lab equipments.

Details of papers/patents: Comprehensive review on developing bio ink.

Brief description of working environment, expectations from the company: It was good, lot of hands on experience in equipments, good environment, friendly project associates.

Academic courses relevant to the project: Advance physical pharmacy, Pharmacokinetics, Quality by design.

PS-II Station:Centre for Artificial Intelligence & Robotics, Bangalore

Faculty

Name: Prof. S. Raghuraman

Student

Name: JOJI MATHEW(2019H1410163H)

Student write-up

Short summary of work done during PS-II: Exploration of ROS platform and GAZEBO software for robot simulation.

Understanding of autonomous navigation and marine craft dynamics.

Exploring underwater robot simulators such as UWSim, UUV simulator.

Building a velocity controller for underwater vehicle.

Tool used (Development tools - H/w, S/w): ROS, Gazebo, UUV Simulator, MATLAB, Blender.

Objectives of the project: To explore the ROS platform and open source Robot simulators such as GAZEBO and UUV simulator. To add the sensors which were not already available for simulation as packages. To design a PID controller for the underwater vehicle.

Major learning outcomes: Learnt about Robot Operating System Platform for Robot simulation, marine craft dynamics and explored underwater simulation with UUV simulator as well as PID controller.

Details of papers/patents: M. M. M. Manhães, S. A. Scherer, M. Voss, L. R. Douat and T. Rauschenbach, "UUV Simulator: A Gazebo-based package for underwater intervention and multi-robot simulation," OCEANS 2016 MTS/IEEE Monterey, Monterey, CA, USA, 2016, pp. 18, doi: 10.1109/OCEANS.

Brief description of working environment, expectations from the company: The CAIR lab is a highly secure DRDO facility with no electronics or storage devices allowed. The internet connection is limited for browsing due to security issues. Student Interns are provided with a trainee room with a PC.

Academic courses relevant to the project: The mechanical courses relevant to the project are Robotics or Mechatronics and control systems. Programming skills are also relevant.

PS-II Station:Cisco Systems (India) Pvt. Ltd., - Software Engineering, Bangalore

Faculty

Name: Prof. Raja Vadhana P

Student

Name: ISHAAN KOCHAR(2016B2AA0589G)

Student write-up

Short summary of work done during PS-II: The work aims to integrate analysis of open-ended text comments and video feedbacks with WXM. The integration is done with the help of two very powerful yet elegant services – ParallelDots (for open-ended text) and Amazon Rekognition (for video). Each response from WXM is post filled using these services using different API endpoints. Later on, a service based on Raspberry Pi is developed for capturing emotions using a camera at a retail store where customers stand and interact with the store staff. The service has an intuitive React.js based UI for the staff to fill in details and trigger the Python-based backend.

Tool used (Development tools - H/w, S/w): Software - C#, ngrok, IIS Express, Python, React, FER, face_recognition, ParallelDots, Amazon S3, Amazon SNS, Amazon Rekognition, Amazon SQS.

Hardware - Raspberry Pi 3b+, Pi camera v1.3.

Objectives of the project: Open-Ended Text Analytics, Video Customer Feedback Analytics and Live Image Analytics for Retail Use-Case Using Raspberry Pi.

Major learning outcomes: Learnt about APIs, Customer Satisfaction metrics, Raspberry Pi, Flask, React, Python programming.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment is excellent and the team ensures you are given projects in which you learn and grow. You are given your own space and time to learn things and deliver.

Academic courses relevant to the project: Object Oriented Programming, Database Systems

Name: SAHEJVEER SINGH(2017AAPS0359H)

Student write-up

Short summary of work done during PS-II: My work involves developing, maintaining and testing APIs for a product at Cisco. I was involved in regular day-to-day work rather than a standalone project. I worked on implementing new functionality within REST APIs, fixing bugs, load testing, documenting, deploying and otherwise maintaining the APIs. The initial part of the internship went into learning the stack as well as getting familiar with the product, code-base and some of the technologies used, as well as learning how to incorporate security into the product. I worked on two different micro-services within the same product over the course of the internship. Tasks were carried out in 2 week long sprints.

Tool used (Development tools - H/w, S/w): Java, Python, Spring, Spring Boot, Docker, Postman, OpenAPI, Locust.

Objectives of the project: To develop, maintain, test and document REST APIs for different micro-services within the product.

Major learning outcomes: The Agile software development lifecycle, from writing code to testing to deployment. New technologies like Docker and frameworks like Spring, Locust etc.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: People at Cisco are very welcoming and helpful. Within my team specifically, my manager and mentor were very understanding and patient. They did not put us under much pressure and wanted us to learn and pick up skills at our own pace since we were interns. We were given tasks within the sprints and our mentor was always there to clear doubts. Our manager was also available for us to communicate with when we wanted. The expectation from our manager was primarily for us to put effort into learning new skills and getting accustomed to the development lifecycle from start to finish, apart from contributing to the team. Since my manager and some of the team were in USA, daily scrum calls were usually in the evenings, around 6-7 pm.

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

Name: DIPAYAN DEB(2019H1030015G)

Student write-up

Short summary of work done during PS-II: My work centered about X.509 certificate specification, how to create and use them and how PKI based certificate authority work based on the X.509 certificates. I was also able to work on creating front end web application along with rest api and backend application to support the front end.

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

Objectives of the project: To improve the internal certificate authority present in Cisco ise as well as to introduce more recovery measures.

Major learning outcomes: Public key Infrastructure, X.509 certificates, JavaScript, Java, Spring, Microservices, Backbone.js, Design of REST API.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment was very nice. I was surrounded by people that were passionate about their work. They were willing to impart their knowledge and share their experience and help whenever required. There is immense amount of learning opportunities present. My expectations were to learn how to build scalable, reliable and productive software that millions of people use around the world. I got the opportunity to learn all of the above and this internship was certainly the starting point to a long journey of learning and carrier building.

Academic courses relevant to the project: Network Security, Advanced Computer Networks, Advanced Operating Systems, Software Engineering, OOPS.

Name: AGRAWAL LUCKY(2019H1030017P)

Student write-up

Short summary of work done during PS-II: 1. Scripts for automated end to end testing 2. Experiment with new compression algorithm 3. Anomaly detection.

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

Objectives of the project: To improve the webex based CI/CD by continuous monitoring and enhancing media reports.

Major learning outcomes: 1. Software development life cycle2. GitHub3. CI/CD4. Kubernetes.

Details of papers/patents: None.

Brief description of working environment, expectations from the company: Friendly, supportive, motivating and connected.

Academic courses relevant to the project: Network programming.

Name: KARAN GARG(2019H1030515P)

Student write-up

Short summary of work done during PS-II: Developed a tool that parses CUBE (Cisco Unified Border Element) logs and present the information in clear/user-friendly format. Some Call Flows were in-built into tool and any deviation was pointed out for the ease of user.

Tool used (Development tools - H/w, S/w): CUBE (Cisco Unified Border Element), TranslatorX, PyCharm, Bitbucket, SIPp.

Objectives of the project: CUBE logs are difficult to search through for RCA (Root Cause Analysis). Objective is to build a tool to present information in more clear manner.

Major learning outcomes: VoIP specifically - SIP, SDP protocol.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The work environment was good and the whole internship was a great learning experience. All the team members were very friendly and easily approachable. My manager and mentor were very supportive and co-operative throughout the internship.

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

Name: SHAH PARTH SHASHIKANT(2019H1030563G)

Student write-up

Short summary of work done during PS-II: The work done during PS-II has given me exposure to the projects that are being worked in the industry. I got the opportunity to work on projects using python, c++ as well as Java.

Tool used (Development tools - H/w, S/w): Cygwin, Visual Studio, Atom text editor, NetBeans

Objectives of the project: One of my project was on automation, another was in testing, another was to create c++ based monitoring library which was later extended to support TPM chip, lastly java based project was required UI changes using swing and form manipulation in that.

Major learning outcomes: Was able to learn the coding standards and also learnt about security on endpoint.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment in Cisco is very good. We have the flexibility to work on our own time and work life is balanced pretty well. The manager and company will expect that you complete the task in given time and also you should be very clear with the task which you have done. Also the solution which is coded needs to meet the coding standards used by the company.

Academic courses relevant to the project: Computer Networks, Advanced Computer Networks, Operating System, Network Security.

Name: PARIKH DHAIRYA SHRUJAL(2019H1030906G)

Student write-up

Short summary of work done during PS-II: Cloud-Connected Unified Communications (CCUC) is a suite of Cisco webexcloud services with a single global view to manage on-premises UC and Unified CM cloudservices. CCUC is an efficient, cloud-based managed services product for an on-premisesunified CM deployment. It helps the customer to monitor, control, analyse and upgrade theentire enterprise network using cloud-based services.In CCUC, we already have a static help available in the form of info icons on the charts butthat may not be effective enough to resolve the dynamic queries of the customers. Therefore, the aim is to develop an efficient, intelligent and interactive Chatbot using the concepts of Deep Learning (DL) and Natural Language Processing (NLP), which will properly resolve the customers' query by providing the required information in the most context sensitive way without any human intervention. Furthermore, it will be capable enough to render images, provide URLs and guide through the steps if available, in order to provide effortless experience to the customers.

Tool used (Development tools - H/w, S/w): Machine Learning, Object Oriented Programming, Data Structures and Algorithms, Cloud Computing.

Objectives of the project: The objective is to develop an UI based intelligent chatbot, using the concepts of Deep Learning (DL) and Natural Language Processing (NLP), which will interact with customers' to resolve dynamic queries in real-time by providing the required information in the most context sensitive way. The chatbot will be competent enough to render images, provide URLs and guide through the steps if available, in order to provide ease to the customers.

Major learning outcomes: ML and NLP concepts, basic of DL concepts and Neural Networks, software development life cycle, creation of REST APIs in Python using FastAPI, UI development using ReactJS, WebSocket protocol for session manangement, tools like static analysis of the code, automation testing and Vul-nerability scanning.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was really good working with the team, managers and everyone at the organisation. Managers were too supportive and encouraging. The internship went really smooth and it was a great learning experience.

Academic courses relevant to the project: Machine Learning, Cloud Computing.

Name: MEGHNA RAJ(2019H1120053P)

Student write-up

Short summary of work done during PS-II: Cisco provides multiple solutions in order to manage Firepower Threat Devices (FTDs). These solutions vary in terms of scalability and offering of various features. Firepower Device Manager (FDM) is a single-device on-box management solution that manages FTDs. Firepower Management Centre (FMC) is the administrative nerve centre for managing critical Cisco network security solutions. It provides complete and unified management over firewalls, application control, intrusion prevention, URL filtering, and advanced malware protection. Team can view details about customer video mesh deployments. Typically, medium and large-scale customers exceed the limit of number of devices managed by a single FMC or FDM instance. Hence, there is a need to migrate policies from one FMC to another or from one FDM to FMC. As part of this project, the idea is to develop a robust framework that is capable of inputting different configuration data sources to FMC and achieve a data driven model converter.

Tool used (Development tools - H/w, S/w): Golang, Visual Studio Code, Github, Postman.

Objectives of the project: The project consists of 3 different use cases, out of which I am involved with the 3rd use case, that is, Data Migration from FDM to FMC of the Data Migration Service Development. The problem statement of the project is as follows: FDM and FMC both are managers for FTD. FDM is installed by default on the device and it can manage just that device. FMC can manage up to 800 FTDs. Every time a customer buys an FTD, he needs to

configure an FDM to manage that device. Also, the FDM provides limited features while the FMC provides multiple features. So, the same FTD is managed by multiple managers. If an FMC is provisioned for the customer, he will be liberated from managing multiple FDMs. All the FTDs can be configured and managed by one FMC until it reaches its full capacity, when another FMC will be provisioned for the customer. So, the objective is to migrate configuration from Single-Device on-box manager (FDM) to Multi-Device Manager (FMC).

Major learning outcomes: Understanding the architecture and working of FMC and FDM, the various object configurations, software designing in industry, practical exposure to REST APIs, Go programming language, working with visual studio code, Git, REST APIs using Postman.

Details of papers/patents: A survey on the role of Internet of Things for adopting and promoting Agriculture 4.0 in Journal of Network and Computer Applications, Elsevier.

Brief description of working environment, expectations from the company: The technical leaders of the project have created a healthy communication among the team members with weekly meetings having open discussions and sharing of ideas. The senior members of the team helped me with learning the new technologies that is required on a day-to-day basis. My mentor was very supportive and plays a key role in learning and development. It is expected to take the ownership of the work done and provide any inputs in smooth execution of the tasks.

Academic courses relevant to the project: Software Engineering and Management, Software Architecture.

Name: NAVNEEN BABU SREELATHA(2019H1120055P)

Student write-up

Short summary of work done during PS-II: Developed a mobile application POC(proof of concept) for the Cisco CX cloud web portal. As it was a POC, we tried different technologies. We first started with native application for Android using Kotlin. Then, we were asked to switch

to a hybrid solution using Ionic framework and Angular. We also integrated AWS services with the app like AWS SNS for push notifications. We also explored frameworks for automation testing and wrote test cases for the application using Appium framework and used AWS device farm for testing. We used CircleCI for CICD. As this was an application that was to be developed from scratch, we had to design the architecture and had to attend a lot of architecture meetings with other teams during the planning of the project. We had frequent demos and feedback calls with the leadership team and had to incorporate the changes requested by them.

Tool used (Development tools - H/w, S/w): Android Studio, Xcode, Visual Studio Code.

Objectives of the project: The objective of the project was to use different technologies and frameworks and document all the learnings.

Major learning outcomes: Learnt new frameworks like Ionic and Angular, learnt about CICD pipeline using CircleCI.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The team was very supportive and we had full freedom to voice our opinions and ideas while designing the architecture. Daily scrum calls would help us keep our manager updated on the progress of the application. Collaborating with other teams was also very easy. The team also had bi-weekly sessions for “Tech-Talk” where one team member would present a new technology that he learnt in that month. Apart from that, the team organizes a fun team-bonding activity every month.

Academic courses relevant to the project: Object Oriented Analysis and Design, Software Architecture, Cloud Computing.

Name: MAURYA ARUN MOTILAL RANJANA(2019H1120062P)

Student write-up

Short summary of work done during PS-II: Understanding of the existing cloud platform for container orchestration and lifecycle management by Cisco (Intersight) from customer's perspective and then slowly from developer's perspective. Setting up the development environment and understanding the basics by going through various developer guides, blogs and videos for the project. Working towards a specific microservice and adding code to it for Kubernetes inventory purposes. It includes working with API calls within the framework, logging, testing, working along with the CI/CD and version management tools to keep things up to date.

Tool used (Development tools - H/w, S/w): Python, Golang, Kubernetes, Docker, Jenkins.

Objectives of the project: Add inventory related functionality within one of the microservice.

Major learning outcomes: Understanding about Kubernetes, docker and how cloud projects are managed in organization. Learnt Golang programming language and working in a team with Agile methodology.

Details of papers/patents: None

Brief description of working environment, expectations from the company: A very supportive working environment where you can easily ask for help and learn new things. The company takes care of its employees in every way possible and also organizes various fun events. You do get recognition for the efforts you put in by other people. Expectation from the company includes a full time employee opportunity for the interns.

Academic courses relevant to the project: Cloud Computing.

Name: POJALAKSHMI D(2019H1400098G)

Student write-up

Short summary of work done during PS-II: Enabled interactive prompt on the SDWAN testing framework for debugging the tests when there is a failure. Integrated WANem for the SDWAN testing framework which only supported SDWAN devices. Created dashboard using Kibana of ELK stack and wrote a script to push the data to ElasticDB.

Tool used (Development tools - H/w, S/w): Python, Qemu/KVM, VS Code, ELK.

Objectives of the project: xxx is a test automation framework that enables end-to-end testing of the Cisco SD-WAN solution. The aim of this project is to add multiple features and improve the quality of vTest codebase. The codebase can be improved by revectoring of the libraries, adding the unit tests for the library APIs. Features such as integration of non SDWAN to xxx framework , debugging consoles while running the tests can be added.

Major learning outcomes: Debugging the issues, Writting efficient code, SDWAN.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working hours are flexible, sufficient time was given to complete the project. Team members were always helpful.

Academic courses relevant to the project: Software Engineering and Management, Software Testing Methodologies.

PS-II Station:CL Educate Ltd., New delhi

Faculty

Name: Prof. K Venkatasubramanian

Student

Name: JECELYN JOSE(2019H1490863P)

Student write-up

Short summary of work done during PS-II: I created various campaigns in the form of web messages, web push notifications and customer journeys. The work involved understanding lead management and creating lead capturing or lead nurturing campaigns. By the end of 6 months I contributed to a total of 33,369 and 6,826 lead form sign ups in the MBA and IPM categories, respectively as well as 8,800, 1,735 and 1,735 product purchases in MBA, IPM and law categories, respectively.

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

Objectives of the project: Improving the efficiency of the digital marketing funnel.

Major learning outcomes: I received valuable experience as well as conceptual understanding of the automated process. I gained an understanding for the best practices for email campaigns, CTAs, web messages and web pushes that get conversions.

Details of papers/patents: NA. This was not a research project but a continuous process of monitoring campaigns, making tweaks and improving efficiency.

Brief description of working environment, expectations from the company: CL has an accommodative working environment. The company expects a sincere and an honest work ethic. They are willing to give us more opportunities if we are willing to learn new things and are enthusiastic about work. One expectation is that we finish the work allotted to us on time.

Academic courses relevant to the project: Digital Marketing.

PS-II Station:Class 21A Pvt. Ltd., Gurgaon

Faculty

Name: Prof. RK Tiwary

Student

Name: ANANT BANSAL(2017A1PS0715G)

Student write-up

Short summary of work done during PS-II: Building both front-end/back-end code for features of the websites/ portals, few of the tasks also involved building APIs for the mobile application features. Overall, the work revolved around Express, React, Node and MySQL/MongoDB.

Tool used (Development tools - H/w, S/w): ReactJS, ExpressJS, NodeJS, MongoDB, MySQL.

Objectives of the project: Majority of the tasks were to build new features in the already existing online platforms of the company, and building back-end code for the mobile app features.

Major learning outcomes: The projects helped in enhancing my full stack development knowledge, along with this working on huge code-base/data introduced me to new techniques of optimisation and learning of advanced coding practices.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The seniors at the company are super helpful and available to help whenever you are stuck, the work timings are really flexible. Anyone looking forward to build a carrier in tech will have a good time working.

Academic courses relevant to the project: NA

PS-II Station:Cohesity Storage Solutions India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Jyotsana Grover

Student

Name: ISHAN SANG(2017A7PS0069G)

Student write-up

Short summary of work done during PS-II: Worked on mainly 2 things:

1. Sample App:

Created a sample application which would help developers to create more marketplace applications at a greater pace. Ex: developers take around 2 months to create an App for the cohesity marketplace, but with the help of the sample App, we were able to do POC for an App in 2 days.

2. Secure authentication for Marketplace Apps:

Most of the Apps in the Cohesity marketplace had no https endpoint and could be accessed by anyone without authorisation. Used a reverse proxy with TLS termination and auth module, did a POC on the sample App and applied the model on other Apps to provide secure authentication with minimal changes in App codebases.

Tool used (Development tools - H/w, S/w): Git, Linux, Golang, Docker, Kubernetes, MySQL, Angular, Node.js, Nginx.

Objectives of the project: Faster App Development, Secure Authentication for Marketplace Apps.

Major learning outcomes: 1. Learnt how to use Git properly.

2. Got to see and be a part of the SDLC of a company with a huge code base.

3. Understood the need of containerisation, container orchestration and got some hands-on knowledge on the same.
4. Got a deeper understanding of networking.
5. Learnt how to write APIs and unit tests.
6. Understood the difference between raising a PR for a repo with small number of users and large number of users.
7. Got an idea of how applications work as a whole (mostly backend, parts of frontend as well).

Details of papers/patents: NA

Brief description of working environment, expectations from the company:

Meetings: Scrum meeting everyday, Sprint planning fortnightly, Work demo/presentations - once or twice in a month.

Overall working environment: Pretty good, was able to frankly communicate with manager regarding deadlines which were too overwhelming and got constant and prompt help from the whole community over the globe (via slack/ zoom meetings).

Expectations: Expect one to be a quick learner and be able to pick up new languages/technologies over a weekend; in terms of work no strict deadlines as such.

Academic courses relevant to the project: Database Systems, Computer Networks, Operating Systems.

PS-II Station:Collins, Bangalore

Faculty

Name: Prof. S. Sindhu

Student

Name: RAGHU PREM B(2019H1060518H)

Student write-up

Short summary of work done during PS-II: The work mainly involves the manual testing of the NX checkmate automation feature developed in house for the cargo mechanical systems. NX checkmate is a feature in NX which checks the conformance of the feature with respect to standard practices and the work mostly focuses on making different CAD drawings and then testing the algorithm to meet the business requirements.

Tool used (Development tools - H/w, S/w): Siemens NX 9.0.3.4, Visual Studio 2015, Tortoise SVN, WInMerge.

Objectives of the project: To develop a robust checkmate automation for cargo mechanical systems.

Major learning outcomes: Understand testing and development methodologies in large corporations, understanding the SDLC.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Collins Aerospace is a very good company to work. The environment is very friendly and the colleagues are supportive and provide ample learning opportunities for working in variety of problems and domains. The projects are also tough, challenging and test your application knowledge in depth.

Academic courses relevant to the project: Computer Aided Analysis and Design.

PS-II Station:Confluent India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Febin Vahab

Student

Name: KEERTHANA SRIKANTH(2017A7PS0066G)

Student write-up

Short summary of work done during PS-II: Set of independent tasks which contributed towards improving proactive support for confluent cloud. The tasks involved:

- Writing a load test (including setting up infrastructure for the load test, implementation and analysis of results).
- Adding support for dependency injection in codebase (evaluating 2 dependency injection frameworks - Guice and Dagger, integrating Dagger with codebase).
- Adding support for phased feature launch by integrating LaunchDarkly
- Improving API error titles
- Unit testing, etc.
- Writing technical documents for tasks (if necessary)

Tool used (Development tools - H/w, S/w): Java, Python, Vert.x, Kubernetes, Helm, Dagger, Guice, LaunchDarkly.

Objectives of the project: Improve proactive support for confluent cloud. The load test for the application will run before each release to ensure that the application can handle production-like load. Dependency injection support will help reduce boilerplate code in codebase and increase testability. Phased feature rollout will enable easier launch of features to segments of users at a time. The other tasks were aimed at improving the code/API/performance, etc.

Major learning outcomes: End-to-end deployment of an application, load testing, unit testing, etc.

Learnt several tools, technologies and technical concepts such as Docker, Kubernetes, Helm, Asynchronous programming (Vert.x), Dependency injection and dependency injection frameworks (Guice, Dagger), SOLID design principles, Design patterns (factory pattern, builder pattern, etc.)

Learnt general skills useful in industry such as writing technical documents, evaluating pros and cons of technical alternatives, collaborating and building consensus with multiple stakeholders.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The company culture is really good. Everyone in the team is very helpful and supportive. There is transparency and emphasis on collaboration. Work life balance is good and deadlines are reasonable.

Academic courses relevant to the project: Object Oriented Programming, Basics of Operating Systems and Networks.

Name: LAKSH SINGLA(2017A7PS0082P)

Student write-up

Short summary of work done during PS-II: Goal of the project was to develop a splunk s2s connector. Connect is a part of the Kafka ecosystem that allows integration of data between Kafka and external ecosystems.

Tool used (Development tools - H/w, S/w): Java, Kafka Connect, Docker, GCP.

Objectives of the project: Aim was to create a Splunk connector that can ingest the data in S2S format and generate corresponding Kafka events.

Major learning outcomes: Remote work, Java, Concurrent design, Netty.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: The people at the company are amazing and friendly. I learnt a lot at the place.

Academic courses relevant to the project: Object Oriented Programming

Name: PAI ABOLI VIJAYANAND(2017A7PS0147G)

Student write-up

Short summary of work done during PS-II: Confluent provides a platform to manage the event streaming platform Apache Kafka. The project was designing and developing a task flow scheduler. The project aimed at reducing the manual effort required to manage different workflows running on the Confluent cloud and Confluent platform. I designed a scheduler which was able to schedule, manage and execute tasks periodically. The user also be sent alerts on slack for different job activities. The results of these tasks would also be validated and the user will be alerted for any errors. I also developed different health check and fault injection tasks which were deployed using the task flow scheduler.

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

Objectives of the project: The objective of the project was to simplify the way different tasks are managed. The task flow scheduler can be used across different teams for managing all their workflows. One of the major objectives was to integrate a proper alerting mechanism so that the users can get the status of their tasks on slack or through emails.

Major learning outcomes: 1) End to end product development 2) Exposure to new technologies and techniques 3) Apache Kafka working and confluent specific learnings.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The internship was entirely remote. The team members were extremely helpful and prompt to answer any doubts. We were expected to complete the project within the given deadline. Ample time was given for ramp up and understand the concepts. Interns were encouraged to come up with their own ideas. The work culture is good and I did not feel overworked or stressed during the internship.

Academic courses relevant to the project: Operating systems, Database systems, Object oriented programming.

PS-II Station:Couture AI, Bangalore

Faculty

Name: Prof. Preethi N G

Student

Name: ARCHITA SUKHWANI(2016B4A70741G)

Student write-up

Short summary of work done during PS-II: The project involved building a search engine and evaluating its performance. The project involved using user interactions data to improve the pre-computed results. An algorithm to use the pre-calculated results to serve the user in real time was developed. The performance metrics were also custom defined. Both offline corpus generation and performance evaluation codes were made into an automated pipeline whereas the online algorithm was converted into a simulator using flask api.

Tool used (Development tools - H/w, S/w): Python, Scala, Airflow, IntelliJ, Jupyter Notebook, GitHub.

Objectives of the project: 1. Replicate the real time processes of search engine and measure the performance 2. Improve the offline process of corpus generation to enhance the quality 3. Leverage user interactions data to improve search results.

Major learning outcomes: Working of a search engine and its performance measures.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The entire internship was WFH and during these hours, we were expected to be available online on Gchat for any work related purposes. There was a daily stand-up call per team where we were expected to update the status on work allotted/done on previous day as well as the plan for that day. Company organized weekly meet to relax and connect. My colleagues were very friendly, knowledgeable and helpful.

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

Name: REVENTH SHARMA(2017A1PS0832P)

Student write-up

Short summary of work done during PS-II: Developed a recommendation system model for an e-commerce platform. Various models and methods were experimented upon to get evaluation scores of Algorithm above baseline. Developed a flask-based API which does CRUD operations and queries a No-SQL key-value database.

Tool used (Development tools - H/w, S/w): Docker, Airflow, IntelliJ, Git, JupyterLab, Spark, HDFS, Python3, Scala.

Objectives of the project: To develop a recommendation Algorithm which performs better than baseline already in use.

Major learning outcomes: Learnt to develop recommendation system, artificial intelligence pipelines, extract transform load pipelines for data science tasks, implement data science models at scale. Improve code performance, efficiency, and track for bugs.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Great work environment, helpful culture for learning and clearing doubts. There are weekly sessions for discussing new developments in AI technologies and understanding existing ones. Great company for overall development.

Academic courses relevant to the project: Neural Networks and Fuzzy Logic, Data Mining, Applied Statistical Methods, Machine Learning, Data Structures and Algorithms, Database Management Systems, Object Oriented Programming.

Name: ADITHYA SAMAVEDHI(2017A7PS0071G)

Student write-up

Short summary of work done during PS-II: The aim of the project is to build recommendation systems from raw data. User video interactions are given which depict of users have interacted with videos. Given this information, the task at hand is to develop predictions for each of these users. The task is to try various ready mode and custom made experiments for recommendation systems.

Tool used (Development tools - H/w, S/w): Python, Google colab, Jupyter Notebook.

Objectives of the project: To develop predictions for a set of users based on their past history.

Major learning outcomes: The ability to handle large and noisy data. The key learning was to communicate with team members in an entirely online based setting. The challenge is to densify data and train models on smaller data and then scale up to work on larger data.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work environment is very encouraging, everyone in the company is willing to help even on weekends. All employees of the company are approachable and knowledgeable in their fields. They always suggest improvements in code and newer frameworks that help keep us updated in the field.

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

Name: ASHRUT KUMAR(2017A7PS0137G)

Student write-up

Short summary of work done during PS-II: The team I was allotted to work for creating a search engine for a client. The company has well-built search engine that handles user queries and generated well-structured JSON containing the intent of the search query, which is then used to retrieve products by Apache Solr. I was allotted various tasks which are improvements to their current search engine for their next release version.

The first task allotted to me was the task of Word and Phrase Synonym extraction from their product corpus. Having a set of vertical-specific (fashion in this case) synonym sets incorporated in the search engine greatly improves its performance. For this task, I researched and implemented multiple ways of synonym extraction from a corpus as well as predefined synonym sets.

The next task allotted to me was the task of automated attribute value extraction from the product name. This means extracting the value of attributes such as color, length, fit automatically from the product name. Both supervised and un-supervised methods were tried for this task, to improve the quality of the catalog dataset. Other minor fixes and updates to the corpus generation pipeline were also performed. To measure the performance of the final corpus, I also worked on generating some metrics and plots.

Tool used (Development tools - H/w, S/w): Python, Scala, Spark, Scikit-learn, Pandas, Numpy, Keras.

Objectives of the project: To improve and add more features to their current search engine corpus generation algorithm.

Major learning outcomes: Using spark to handle large sized datasets. NLP techniques used for automatic attribute extraction from product description as well as for creating a corpus for a search engine. Metrics to analyze the performance of a search engine.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment is pretty good, good communication between other team members and overall quite helpful nature. Company expects you to be a self starter, figure out how things need to be done, learnt new technologies over the weekend, and take complete ownership of your idea.

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

PS-II Station:Credit Suisse - Global Market Risk Management, Mumbai

Faculty

Name: Prof. B.V. Prasad

Student

Name: VAIBHAV RATHORE(2017A4PS0642H)

Student write-up

Short summary of work done during PS-II: I worked across 2 teams, Equity Scenarios & Fixed Income Scenarios. I was mainly involved in the preparation of risk summary for the equities business with detailed explanation of material moves in key risk metrics for senior risk managers and front office desk heads. Evaluated the consistency of trades that the firm closes by adhering to classical risk management models like VaR, Sensitivities, Greeks. Also, automated a few process workflows using R, SQL & VBA.

Tool used (Development tools - H/w, S/w): R, VBA, SQL, Microsoft Excel, MS Access, Internal tools.

Objectives of the project: Perform risk analysis, reporting, commentary on major moves on BAU basis. Improve upon the existing process flow in the scenario generation, validation & reporting.

Major learning outcomes: 1. Learnt about variety of structured products such as Autocallables, Barrier options, Accumulators etc. and their risk exposure across the asset classes (Equity, FX, Rates, Commodities). Understood the impact of scenarios & sensitivities on the PnL by applying appropriate shocks.
2. Using R & SQL for automation, and Excel as a powerful tool for quick analysis, using Pivot tables, VBA Macros and other Excel functions.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Company culture was nice. Mentors, manager & all other teammates are friendly & easily approachable.

There are frequent learning & interactive sessions with the team, which provides a good platform to learn & clear doubts. Working hours are mostly manageable, except for few instances where you will have to pull up things really quick. Basic knowledge of derivatives and few software tools like R, VBA, advanced Excel is expected.

Academic courses relevant to the project: DRM, FRAM.

Name: NIKHILA VENKATA KULUKURU(2017B4PS1240H)

Student write-up

Short summary of work done during PS-II: I worked on the quant backtesting team. Most of my work involved studying the various counterparty credit risk models, improving their efficiency or writing code for incomplete processes and backtesting. In addition to this, I created quarterly regulatory reports for these models.

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

Objectives of the project: 1) To improve the efficient of certain risk models 2) To create post process checks for the risk models 3) Have a thorough understanding of the models and create documentation 4) Submit quarterly and monthly reports to the necessary regulatory authorities.

Major learning outcomes: 1) How various types of credit risk is measured and the pipeline of how models are created 2) How the theory is actually applied and implemented in code.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment was really nice. I had certain deadlines and goals my manager gave me every week and if the work was done with some extra effort he was very happy. Everyone on the team

was very approachable and wanted me to have a good learning experience. Overall, even though PS was online it was great experience and I learnt a lot.

Academic courses relevant to the project: FRAM, DRM, Probability & Statistics.

PS-II Station:Credit Suisse - Non-Financial Risk Management, Mumbai

Faculty

Name: Prof. B. V. Prasad

Student

Name: NAYAN CHOURASIA(2019H1490806P)

Student write-up

Short summary of work done during PS-II: During PS-II, I worked with internal controls assessment team in non-financial risk management department. I learnt about various teams in the department, their functions and the major risks involved in the domain. Learnt about controls applied to mitigate these risks and reduce the economic and non-economic loss associated with these risks.

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

Objectives of the project: To perform key control analysis for major risk focus area for the quarter.

Major learning outcomes: Learnt about NFRs, key controls, key control analysis, control taxonomy, advance excel, team work, resiliency, time management and business communication.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Worked by WFH setting and working environment is very good & welcoming. Superiors and colleagues are very helpful and you can reach out to them whenever you need. Work ethics are strong and it is a good place to learn for an intern.

Academic courses relevant to the project: Advance Excel.

Name: BHUMIKA AJMERA(2019H1490809P)

Student write-up

Short summary of work done during PS-II: In PS II, I worked with internal controls testing team of non-financial risk management department. I came to know about non-financial risks existing in the firm and about the internal control testing process done to mitigate those risks. To know about testing process and performing internal controls testing has been my main area of work. I got chance to work on technical tools and learnt from it. Overall, it has been a good learning experience for me.

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

Objectives of the project: To perform control testing to mitigate risks.

Major learning outcomes: Got to know about non-financial risks and testing process, advance excel, team work, time management etc.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Although the whole PS-II duration was WFH but the working environment was very good. I learnt a lot from industry people. Everyone was very helpful and guided me well throughout the duration of PS.

Academic courses relevant to the project: Financial management and accounting, Marketing research.

Name: RUUPALI HAZAARY(2019H1490823P)

Student write-up

Short summary of work done during PS-II: Being a part of the non-financial risk management team, I am aiding the capital, data and analytics subset in monitoring and challenging the risks associated with the bank due to compliance failures, misconduct, technology, or other operational challenges. As the second line of defense for the bank's risk and compliance framework, my work involves looking at incidents within the bank at a global level arising due to the above-mentioned risks and reporting the financial impacts along with remediation to the BoD and regulatory bodies periodically. I am also currently working on the bank's annual quantitative risk appetite recalibration that involves cleansing historical data, structuring them to entities associated and creating dashboards that will aid in re-calibrating the entity risk appetite levels. In addition, building controls within the team to validate data quality using Visual Basic and documenting them as Standard Operating Procedures was another key project that I have been a part of. I was also involved in automating the data segregation and classification processes in Visual Basic and designed dashboard reports that will be sent to over 30 legal entities and all 07 divisions within the bank. I got to understand how operational risk management plays a major role in a financial institution and the parameters upon which risks are weighted and the remediations or the controls that are in place to deal with these risks. Being a part of the team that created SOP gave me an edge to understand fine tuning and presentation details.

Tool used (Development tools - H/w, S/w): Microsoft Office, 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. Automation of key datasets used for identification of risk themes. Creating quality control file to help validate data creation of SOP for the reports.

Major learning outcomes: Broader understanding of the risk concepts. The need for risk and control framework to manage operational risks, how we define risk appetite, what are the types of risk and how they're classified and also the various jargons used in the industry. I learnt the standard ways of reporting and fine tuning to precision. I'm also constantly exposed to materials that are consumed by the top management in the company and I work most of the time with these reports. I took up an initiative recently where I set up knowledge sharing sessions with Subject Matter Experts from different teams to understand their nature of work and how the team operates. This has helped us all learn about functioning of different teams and their roles in turn understanding how they contribute to the department.

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. This has helped me communicate effectively throughout and be able to convey my issues and concerns. My recent training session also helped me learn advanced excel and VBA skills which would help me contribute efficiently to my work.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The reports and the projects worked upon are sent to the Board of Directors on a weekly, monthly and quarterly basis. The appetite setting is done on a yearly basis where this tolerance limit is used by all the divisions and legal entities around the globe. This is the maximum loss that can be taken by the organisation and hence these tolerance limits are set using metrics calculations for across the globe. The analytics and projections helps to understand the changes/ losses that could be expected in the coming cycles and methods to avoid them are suggested.

Academic courses relevant to the project: Financial Management and Accounting, Marketing Research, Corporate Finance and Taxation.

Name: SOUNAK BANDYOPADHYAY(2019H1490861P)

Student write-up

Short summary of work done during PS-II: Roles and responsibilities:

- Source, review and enrich operational risk Indicators (KRI/KCIs) data across the bank, and ensure that is complete and accurate for capital, regulatory, internal, and risk appetite reporting purpose as Operational Risk Framework (ORF).
- Monthly operational risk report production management(Metrics Breach Reporting) – Ensuring high quality reports are prepared and review checks (validations as per defined control model) performed to ensure accuracy and sent across to ORM Stakeholders (Operational Risk Managers, Business COO's and governance forums) within agreed timelines.
- Monthly manual production testing and ensuring accuracy in operational risk report production(Metrics production) and Monthly UAT testing after gathering requirements from IT team.
- Working towards BAU activities, new metrics on-boarding and performed residual risk analysis which is a part of RCSA analysis to ensure high residual risk has been covered by metrics.
- RCSA Analysis: I was responsible for consolidation and analysis of yearly risk rating from different divisions and units. RCSA is a four step process – Inherent Risk Assessment, Control Landscape Assessment, Residual Risk Assessment and Mitigating actions.

Key Achievements

- Identified high residual risks that are not covered by any metrics and on-boarded new metrics covering those high risks.
- Created healthy escalation culture, by creating & managing control management tools like book of work tracker to enable discussion of issues identified by self-review with senior stakeholders. Performed control testing of existing process control and suggested improvement.
- Automated BAU processes and metrics/KRI on-boarding process to improve process efficiency and implemented VBA for risk analysis.

Tool used (Development tools - H/w, S/w): Tableau, MS Office tools, Risk reporting tool, Google Data Studio.

Objectives of the project: To handle end to end BAU (Business As Usual) activities, perform tier risk reporting (Including divisional KNFRs) as per the requirements of the regulatory body and implementing automated solutions in the daily BAU process to increase efficiency and effectiveness.

Major learning outcomes: 1.Learnt basic knowledge about NFRM, what are the different types of risks (i.e. market, operational, liquidity, credit risk etc.) involved, what are risk indicators, different types of reports, about risk register, roles and responsibilities of data provider, risk reporting contact, report owner, metric owner, etc. Learnt about different legal entities and divisions in Credit Suisse.

2. Basic knowledge about data analytics by performing Ad Hoc activities.
- 3.Improved presentation and communication skills where I used to source data from data provider and generate reports to present to higher management.
- 4.Knowledge about the application tools used by Credit Suisse NFRM team for data visualization for advisory purposes to different stakeholders.
- 5.Learnt about automation using VBA through mapping ORR ID of all high residual risks and primary and secondary ID of each of the metrics.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: From my experience, I found all the functions within the bank to be structured and responsible; right from on boarding to access requirements. The teams across NFRM were ahead in planning them for us. Everyone within the team was collaborative, encourage creativity, supportive and helpful with constant guidance every step of the way. The inclusion of an intern into their team as a regular colleague is something that shows the values they hold; say it being part of high level management meetings or approaching anyone for seeking information, motivation or guidance. I will forever be thankful for the constant feedback I received from management throughout the projects, as there are many lessons that will help shaping my personality and my career.

Expectations from the company: Hardworking, dedication, creativity, teamwork, networking ability, good communication skills, better time management and eagerness to learn are some of the parameters that company expects from all the interns to perform.

Academic courses relevant to the project: Financial Risk Analytics & Management.

PS-II Station:Credit Suisse - Quantitative Analysis & Technology, Mumbai

Faculty

Name: Prof. B V Prasad

Student

Name: SHAH DEEP MADHUKANT(2017A3PS0304H)

Student write-up

Short summary of work done during PS-II: Understanding different stochastic calibration models across interest rates, commodities, equity, credit and foreign exchange and being able to run the calibrate the model to current market conditions and highlight error source independently.

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

Objectives of the project: Understanding the tools and identifying scope of enhancement where ever possible.

Major learning outcomes: Stochastic Financial Models, Python, Excel.

Details of papers/patents: None

Brief description of working environment, expectations from the company: A very welcoming working environment with learning as a priority. Company expects the intern to learn and deliver the objectives as mentioned. A finance minor with prior projects in Excel, R, Python are expected.

Academic courses relevant to the project: FRAM, DRM, SAPM, BAV.

Name: NANDULA SAI ARUN KANTH(2017ABPS1486H)

Student write-up

Short summary of work done during PS-II: Perform BAU activities and help the team resolve ad-hoc queries with detailed understanding of market data across asset classes. Understand different VAR models and extreme move calculations to analyze impacts of updates to the market dataset. Support daily and weekly process to update market data without deterioration of data quality. Engage in front and back initiative with aim of improving the existing production(team) process, discontinue redundant process or raise for automation. Worked majorly on commodities and mortgages risk types.

Tool used (Development tools - H/w, S/w): Excel VBA, Credit Suisse proprietary software for analysis.

Objectives of the project: Support and improve production process.

Major learning outcomes: Learnt and got exposed to a lot of market data and risk management. New learnings were more on how market data is handled and used to compute risk using various methodologies and calculations. Worked primarily on commodities and mortgages.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The team as such is very supportive and encouraging. They helped me a lot in giving me the time and aid to learn concepts that I was not familiar with. Credit Suisse doesn't differentiate between full time employee and intern, so expect a lot of responsibility when you start working.

Academic courses relevant to the project: Derivatives and Risk Management(DRM), Financial Risk Analysis and Management(FRAM).

PS-II Station:Credit Suisse - Risk & Finance Data Analytics, Reporting, Mumbai

Faculty

Name: Prof. B V. Prasad

Student

Name: KANUPRIYA GARG(2017B2TS1209P)

Student write-up

Short summary of work done during PS-II: Analysing and reporting CS portfolio positions w.r.t market risk capital, VaR, RNIV. Analysing the impact on portfolios and impact of market moves on capital and reporting them across CS businesses.

Tool used (Development tools - H/w, S/w): MS Excel, company's internal softwares for VaR calculations and for sensitivity numbers.

Objectives of the project: Risk Analysis and Reporting on daily,fortnight,monthly and quarterly basis.

Major learning outcomes: Gained hands-on practical experience about the inner workings and functioning of banks, about risk and other domains of finance. Soft skills(Communication, Team-work,etc.), Excel(intermediate-advance level), Excel-macros. Also, got exposure to corporate office culture.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Managers and the team members constantly support and guide you. The firm don't differentiate between full time employee and an intern. Everyone is very approachable. They expect sincerity, hard-work and most importantly they look for people who show interest in the work. Overall, my experience was really good.

Academic courses relevant to the project: DRM and SAPM.

Name: MOHIT KUMAR JANGIR(2017B3PS1217P)

Student write-up

Short summary of work done during PS-II: Risk reporting for the credit spreads team. Mostly daily work was related to collect data from the relevant stakeholders, perform the due analysis and make a report which can be used by the regulators to further use it in any trade related changes or strategies. Other part of the project was testing of automation for the risk reporting. Feed were given from IT team and we have to perform deep analysis to look for any anomalies in the report and give the required feedback. As a part of the testing, I also created a worksheet wherein we can perform the whole reporting by just putting the data and refreshing the sheets going forward.

Tool used (Development tools - H/w, S/w): SQL, Ms-Excel, Word, Other Company specific tools.

Objectives of the project: Credit spread risk reporting and automation testing. Risk reporting means we have to report on a periodic basis to the relevant stakeholders about the changes in any trades, so that they can use that in making strategic development.

Major learning outcomes: Risk reporting, Risk intelligence, Credit products and derivatives, BAU.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Credit Suisse is a very good company to work with. All the colleagues are very supportive be it your own team members or any other member of some different team. It has a very supportive environment if someone wants to learn and apply the same on real work. Proper training is given to everyone to understand the business-as-usual. If someone wants to learn something new then there's proper channels for that as well. All in all, I am glad that I worked with this organization for the start of my career, I gained a lot from it and ready to explore and learn more in future.

Academic courses relevant to the project: DRM, FRAM, FINE.

PS-II Station:Credit Suisse- Finance Change, Pune

Faculty

Name: Prof. B.V. Prasad

Student

Name: ABHISHEK S(2019H1490812P)

Student write-up

Short summary of work done during PS-II: Day-to-day activities involved analyzing requirements and strategic fit, stakeholder engagement, finalizing design and architecture of the solution to ensure proper flow of OTC derivatives and long-term debt related information within the Credit Suisse systems to ensure the trading life cycle phases are all appropriately handled. Also involved in reporting, defect and change management of these solutions.

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

Objectives of the project: Architectural design and flow for OTC derivative and long term debt in compliance with regulatory needs.

Major learning outcomes: Conceptual understanding of how trading lifecycle is handled within global investment banking setup and how regulatory requirements shape up this process.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Environment where saying 'I do not know' is not a Taboo, thereby giving you the freedom to learn. Teams that generally value hard-work and provide support when needed. In return, the expectation from the company is to see desire to contribute and add value to the team by delivering on promises.

Academic courses relevant to the project: FMA, BAV, SAPM, FE, PM.

PS-II Station:Credit Suisse- Investment Banking and Capital Markets, Mumbai (Worli)

Faculty

Name: Prof. B.V. Prasad

Student

Name: DWAIPAYAN BHATTACHARYYA(2017A1PS0831H)

Student write-up

- Short summary of work done during PS-II:** 1. Assisting deal teams on live projects such as IPOs, QIPs, issuance of debt securities.
2. Carrying out executional tasks like preparing pitching materials, financial models and statements, information memoranda, etc.
3. Industry research: Chemicals, Cement, Technology, Startups - BFSI, Food delivery etc.
4. Completing operational tasks such as KYC checks, etc.

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

Objectives of the project: Learnt about financial services domain, various processes in executing deals, industries operated among other learning opportunities.

Major learning outcomes: Developed good understanding of deal process, importance of detail and time management, application of key concepts in the financial services domain.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Extremely supportive and understanding team.

Academic courses relevant to the project: Fundamentals of Finance and Accounting, Financial Management, Business Analysis and Valuation.

Name: NIKITA NILEEN GOHEL(2017A1PS1062H)

Student write-up

Short summary of work done during PS-II: Mainly responsible for assisting the analysts in preparing materials for various deals. I worked on various presentations and memos - putting in financial statements, summarizing them, writing commentaries, benchmarking with competitors, making excel sheets for pulling valuation metrics etc, making relevant slides from data that is either given or has to be searched. I also did a lot of company/industry research for various purposes.

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

Objectives of the project: To assist in the preparation of materials for clients and investors, as well as within the firm.

Major learning outcomes:

1. Gained exposure to different types of industries since deals are spread across many sectors.
2. Got an idea of various metrics used to value companies, and how metrics differ from sector to sector.
3. Learnt about different deals and the process involved in them (IPOs, bond issue, follow-on offers, QIP etc).

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The people are friendly, they do not expect you to know much beforehand. Someone is always there to answer queries/doubts related to any part of the assigned work.

Academic courses relevant to the project: Fundamentals of Finance and Accounting.

PS-II Station:Crossbar, Gurgaon

Faculty

Name: Prof.Ramesh Venkatraman

Brief write-up on PS-II station:Following are the common expectations from the students across the PS Station:-

- (a) Self-starter, Taking initiative
- (b) Be prompt, Responsive
- (c) Open to learn, Quick to learn
- (d) Ability to communicate effectively - Oral & Written

Student

Name: VARAPULA VINEETA(2016A5PS0752P)

Student write-up

Short summary of work done during PS-II: My main work was in database creation,financial crime compliance,antimoney laundering related domain content creation and awareness created using social Microsoft Excel,Microsoft Powerpoint and LinkedIn.

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

Objectives of the project: The objective behind this project is to demonstrate the work I have done in database creation,content creation and awareness created using social Microsoft Excel,Microsoft Powerpoint and LinkedIn. Regularly posting updates about various FCC activities going on in the websites and AML India closed group created by crossbar.This will help in better understanding of my prospective towards the working of Crossbar Financial Crime academy.

Major learning outcomes: FCC/AML/KYC domain knowledge along with database analysis.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Had a flexible work environment with concrete deadlines to be met, the expectations of the company have been excellently met with my work in the domain. Had regular zoom meetings to discuss each others prospects and guidance from the CEO himself.

Academic courses relevant to the project: POE, Business communication, HR, Creative thinking.

Name: BAPIREDDY VISWA TEJA(2017A4PS0796H)

Student write-up

Short summary of work done during PS-II: My work is focused on digital marketing and content creation. As the company has no other employees in the field all the social media platforms of the company are managed by me. I created the content in the form of posters, videos, quizzes, campaigns and other forms to make the social media platforms more interactive.

Tool used (Development tools - H/w, S/w): Canva, Davinci Resolve 17, Microsoft Office.

Objectives of the project: The objective of the project is to promote and increase the presence of company through digital marketing.

Major learning outcomes: How to promote companies on digital platforms, make interactive and eye catching content.

Details of papers/patents: None

Brief description of working environment, expectations from the company: As we worked and interacted through online the experience is completely different. We were assigned different tasks but are kept in the loop of all the things happening in the company. The working hours were flexible and the guidance provided is good.

Academic courses relevant to the project: Finance and Management.

PS-II Station:CueMath Learn Pvt. Ltd., Bangalore

Faculty

Name: Prof. Febin A Vahab

Student

Name: YEMSANWAR AKSHAY(2016A5PS0624P)

Student write-up

Short summary of work done during PS-II: I worked on blogs, blogs pdf, blog optimization, worksheets, branded blogs, module development, SEO practices, and influencer marketing for India and USA workbook sale campaigns. NCERT questions to increase the SEO domain authority and domain traffic of the cuemath pages. We also focus on SEO rankings and performance as those are very important to judge the project's effectiveness and a barometer to understand the quality we are giving and how much the student community appreciates it.

Tool used (Development tools - H/w, S/w): Google Ads, Dadmin, Data Studio, SEO Tools, Google Sheets, Google Docs, Instagram, etc.

Objectives of the project: The aim is to get more and more students to read the content and learn and hopefully like it enough to enroll in the LIVE classes, which is the company's primary business model. I worked on increasing the SEO ranking of Cuemath content pages by completely redesigning the previous pages.

Major learning outcomes: 1. Working in a high-pressure environment to ensure that daily targets are met.
2. Finding out effective ways to manage operations.
3. Stakeholder management to ensure that there are no bottlenecks in the process.
4. Growth strategies keeping in mind the perspective of future market conditions to ensure continuous growth.
5. Acquired the knowledge of setting up Blogs and other live Math's resources live pages.
6. Learnt a lot of excel skills for data cleaning and analysis to ensure the desired output.
7. Learnt a lot about content writing and SEO practices used for the optimization of the content.
8. Performing detailed market research to build a strong base for future projects from the business point of view.
9. Learnt various marketing strategies and worked on one of the most used and effective marketing strategies (Instagram marketing).

Details of papers/patents: No papers/patents published.

Brief description of working environment, expectations from the company: My journey till now in Cuemath has been full of learnings. Being in a high-growth environment, I have been involved in various projects in different domains, which have helped me acquire complete business experience. Projects related to Blog Content, Search Engine Optimization, Growth, and Influencer Marketing have helped me understand the latest trends and methods of SEO and marketing in the Ed-tech space. Overall, the experience has provided me with complete knowledge of early growth start-ups, the challenges involved, and strategies to overcome them. The experience of managing a business in real-time is invaluable, and I am looking forward to make the most out of this experience in the coming months to give my best for the growth and sustainability of the company.

Academic courses relevant to the project: Marketing Research.

Name: VENKATA SRIRAM D(2016B2A10623H)

Student write-up

Short summary of work done during PS-II: Curriculum development such as worked in creating interactive animations using GeoGebra, prepared annual quiz questions, solutions for math problems, review of worksheets.

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

Objectives of the project: Curriculum development.

Major learning outcomes: Curriculum development, GeoGebra.

Details of papers/patents: None

Brief description of working environment, expectations from the company: It was WFH, still the experience was great. Good working environment, friendly and understanding people. My project was not very technical but making simulations(kind of animations) was fun.

Academic courses relevant to the project: Marketing Research.

Name: JAMI SRIHARSHA(2017A2PS0952H)

Student write-up

Short summary of work done during PS-II: I worked in team category growth where there are different roles in these team. I am working in simulations and authoring part where we prepare the content and create the calculators.

Tool used (Development tools - H/w, S/w): Geogebra,HTML, node js.

Objectives of the project: Creating calculators for cuemath pages and creating content.

Major learning outcomes: Learnt new software geogebra where we will create the simulations that means creating calculators for given key words. We will create authoring that means content writing in dadmin templates for cuemth pages.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was good working with the company Cuemath. It is a mathematical training program and the work was also good. All the employees are responsible and also fast in clearing any doubts we have. I got an exposure about how a company runs.

Academic courses relevant to the project: C programming.

Name: VINAYAK AGARWAL(2017A4PS0174P)

Student write-up

Short summary of work done during PS-II: (Jan - Mar) Content creation, involved writing pages using the organization's text editor. Around 3-4 topics per day were to be created. This involved writing content for mathematical topics (with examples, FAQs, exercises) and writing worksheets.

(Mar - June) I wrote some scripts in my spare time, discussed with mentors about this and managed to switch my role to bulk publishing of more than 5000 pages with the help of

automation whose content is dynamically generated. This also involved scripting tasks which would have taken time if done manually like writing Bulk Editing of Pages, Excel Scripts for custom functions, File Segregation, automating certain Excel work, fixing errors in bulk, etc.

Tool used (Development tools - H/w, S/w): Python (PyPy3), Google Sheets (Excel), Text Editor, Learnosity (Used for creating interactive questions in the content).

Objectives of the project: To write/generate mathematical content following good SEO practices.

Major learning outcomes: Understanding of SEO, Programming Efficiency, Google Sheets, Scripts (JavaScript).

Details of papers/patents: None

Brief description of working environment, expectations from the company: The work as a content creator is tough, since it involved writing 3-4 topics per day. Writing topics involved Rough Image Sketch, Solved Examples, FAQs, Exercises etc. while taking care of plagiarism, grammatical errors, SEO practices, inline styles, HTML etc. The peers and mentors were helpful. It was expected to receive a role which was more rewarding in knowledge. When the role was switched to doing bulk automation, the work load was reduced, and was easier to handle than before.

Academic courses relevant to the project: None

Name: CHINMAY AGARWAL(2017A7PS0033P)

Student write-up

Short summary of work done during PS-II: Worked to revamp existing blogs, other content and optimized them to increase their domain authority. Also wrote and published stories, poems

and other non-academic content for the junior students connected with the platform. Worked on cleaning the HTML scripts. Created class pages and chapter pages for the websites. Observed and analysed viewership and its periodic changes for the blogs and other important pages and drew inferences based on that. They done brainstorming for new topics that are to be added.

Tool used (Development tools - H/w, S/w): Google ads, G-Suite AND Power BI.

Objectives of the project: Search Engine Optimization and Content Creation.

Major learning outcomes: Crucial insights into the current education scenario of India.

Details of papers/patents: None

Brief description of working environment, expectations from the company: All the mentors were always available to help up with any problem that we were facing which helped me in keeping myself afloat.

Academic courses relevant to the project: No

Name: BOLISETTY HEMANTH NAGA SAI(2017AAPS0278H)

Student write-up

Short summary of work done during PS-II: The project serves the purpose of content creation for grade 1st to 10th students for creating various activities to help them comprehend their coding curriculum in an effective and more accessible manner. Especially in this difficult time when COVID-19 has affected the whole world, and online education is one way that the learning process does not cease to exist, it's crucial that students get the upper hand in academics and coding while they can't get personal attention from their teacher. I specifically worked on creating trivia's for children so that they can learn topics related to tech, computer science, gadgets, coding in an interactive and entertaining manner. I also created simulations

using GeoGebra. The GeoGebra software creates the simulation in the web pages as an applet that can be embedded in the web pages. I believe it improves the learning process because a student can understand easily because the human brain retains concepts that are visualized than the ones read via traditional textbook studying.

Tool used (Development tools - H/w, S/w): GeoGebra, Google docs, Excel, Internal software, Grammarly.

Objectives of the project: Content creation, Curriculum modification.

Major learning outcomes: The projects helped us deepen our understanding, improve our critical thinking, and have helped me in formulating the right strategy.

I learnt the following skills:

Technical skills: Programming, Content creator, Excel, GeoGebra.

Soft skills: Communication skills, Time management.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Since there is a pandemic situation, we were asked to work from home. So the communications with the company happened via zoom, slack, e-mails, or direct phone calls. The environment is friendly, and the mentors were helpful and would guide you if you are stuck with something.

Academic courses relevant to the project: C programming, basic knowledge of Python.

PS-II Station:Cypress Semiconductor India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Rekha A

Student

Name: KSHITIJ BISHT(2019H1030092G)

Student write-up

Short summary of work done during PS-II: This project involves working with Linux kernel, WLAN driver, firmware and get an idea on the generic code flow of the wpa-supplicant which is a free software supplicant implementation of IEEE 802.11i standard for Linux along with implementing the task of mogrifying the opensource changes. The project involves the task of separating the proprietary changes done on the opensource version of supplicant in such a way that one can enable and disable the proprietary changes to get back the original opensource version. It implies that on disabling the proprietary code, the whole codebase corresponds to the original opensource code version and it seems that there were no proprietary changes done on it in the first place and can be shipped to the client. The client can then pick specific features accordingly and enable the corresponding code for it or he can discard all the changes and just run the opensource supplicant as it is. The final task was to upstream these changes on to the latest opensource Git.

Tool used (Development tools - H/w, S/w): Source insight 4, Mobaxterm, notepad++, Winscp.

Objectives of the project: For a wireless conclusion connection between 2 systems, one requires a supplicant along with WLAN driver running on the host. The supplicant is responsible and already as a program with the driver to finally bring about the wireless connection. For interacting Initial task involved walkhaving a through of the supplicant code base by debugging and looking at logs to understand the whole wpa_supplicant code workflow and understand the function calls involved while bringing up a station and its subsequent connection with an access point has been using an opensource supplicant. Now, the company with addition of top of the opensource version itself. The project its own proprietary changes on involved the task of opensource changes by separating the proprietary mogrifying the changes supplicant in such a way that one can enable and done on the opensource version of disable the proprietary changes to get back the original opensource version. The client can then enable the co rresponding code for it or he can specific features accordingly and discard all the opensource supplicant as it is.

Major learning outcomes: Learnt about working of opensource WPA supplicant, working and interaction of it with driver and kernel in lower level layers.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: A very healthy and friendly environment where I was assigned a buddy who helped me with my day to day activities by having a daily sync up meeting with him. Also, all the team members were really helpful and supportive.

Academic courses relevant to the project: Operating Systems, Computer Networking.

Name: SHREYAS S CHIPLUNKAR(2019H1030153H)

Student write-up

Short summary of work done during PS-II: Worked on adding new features to wifi connection manager module, debugging issues seen in our codebase and fixing these issues. Working on supporting low powered mode for some of the libraries that we support. Worked on adding code to make some of our internal shell scripts more intelligent so that using the pipeline would be much easier. Fixed some coverity issues in some codebases.

Tool used (Development tools - H/w, S/w): GitLab, GitBash, PuTTY, TeraTerm, Modustoolbox, JIRA.

Objectives of the project: Developing and maintaining the software codebase which provides various functionalities that can be used with the target boards.

Major learning outcomes: Understanding various software development techniques and good practices needed to develop software at a large scale. Understanding how a particular issue can

be debugged and the approach needed to solve some problems. Improved some aspects of my communication skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I had a great working environment with all my teammates being very helpful and supportive. They always encouraged me to come up with solution and provided all the support needed to reach the goal. Expectation is to be able to take up the ownership of work and deliver it on time.

Academic courses relevant to the project: Programming in C, Basic knowledge of scripting languages like Python or shell, Data structures and analysis.

Name: MAGANTI ANNAVARAM MITILESH(2019H1400139H)

Student write-up

Short summary of work done during PS-II: To understand and test EZ-USB FX3 and SX3 controller and its configurations.

Tool used (Development tools - H/w, S/w): Hardware: CYUSB FX3, SX3 controller boards, Software Tool: Lattice Diamond, USB Control Center.

Objectives of the project: To append USB 3.0 features to the non-USB systems by using EZ-USB FX3, SX3 controllers and its configurations.

Major learning outcomes: Understanding different communication protocols, debugging hardware and Verilog programming.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Due to pandemic and work from home facility, communication is through calls.

Academic courses relevant to the project: Yes, some of the Academic courses like Reconfigurable computing, Embedded System Design are relevant to the project.

PS-II Station:DBOI - Enterprise Risk Management, Mumbai

Faculty

Name: Prof. Krishnamurthy Bindumadhavn

Student

Name: GLEN FERNANDES(2016B3A40380G)

Student write-up

Short summary of work done during PS-II: I was assigned as a risk manager in LE ICAAP division. Work revolved around RCP, RMF and BRS documents for different regions. They are important to keep a check on capital allocation levels. It is not that hard to grasp. A lot of readings to be done at the initial stages. Have to deal with a lot of excel spreadsheets. Also, assigned a excel automation task as my project.

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

Objectives of the project: Automating excel tasks.

Major learning outcomes: Making end-to-end RCP reports, VBA coding, Excel practices and shortcuts.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The team is very young and are supportive. The organisation culture is very good. Speakup culture is promoted. They appreciate leadership qualities. The team expects you to be proactive and allow you to explore. They also ask for your inputs for certain issues. Global exposure is also given.

Academic courses relevant to the project: Derivatives and Risk Management, SAPM.

PS-II Station:DBOI - Finance, Mumbai

Faculty

Name: Prof. Krishnamoorthy Bindumadhavan

Student

Name: SHIVANSH AGARWAL(2017ABPS1044P)

Student write-up

Short summary of work done during PS-II: I worked at Business Finance Group at DBC, Mumbai and I am part of the Global Emerging Markets (GEM) Business. I am responsible for performing daily P&L and Risk: reporting and signoff for Deutsche Bank's GEM business in America (LATAM) and London (CEEMEA). As part of the team, I take care of running the daily Risk and P&L of certain portfolios and re-attributing the gaps that are generated between the Front Office and P&L reporting system (DB Palace) by providing a proper reason for each of the gap. Daily, we send the final risk (IR Delta, CCY Delta, Credit Spread Delta and FX Exposure) and a P&L to the trader's desk and, we sign off the P&L in DbPalace, our official P&L reporting system. This process includes reviewing and posting any adjustments, re-attribution within the system.

Tool used (Development tools - H/w, S/w): DB Analytics, Risk Engine, MOAR, DbPalace, Summit.

Objectives of the project: Daily we send the final risk (IR Delta, CCY Delta, Credit Spread Delta and FX Exposure) and a P&L to the trader's desk and, we sign off the P&L in DbPalace, our official P&L reporting system. This process includes reviewing and posting any adjustments, re-attribution within the system.

Major learning outcomes: This short period has helped me understand how important decisions are taken to ensure higher profits, lower risks, and sustain ethics. It gives me a deeper insight and understanding of the subject. I also learnt about data flow in bank and how different team functions in maintaining the data flow. This overall experience has been very fruitful in giving me the perspective of corporate organization functions with its diversified businesses and processes within the firm. I thank this prestigious opportunity which would accelerate my learning curve and aid me to make future career-related decisions.

Details of papers/patents: None

Brief description of working environment, expectations from the company: In a span of 4 months, DBC has helped me better my soft skills to connect and coordinate various people across different levels and how to approach them for assistance concerning any technical skills. I came to understand the functionality of a financial institution. I have been able to get a holistic view of the Bank's internal applications, including DB analytics, Risk Engine, MOAR, DbPalace, Summit, etc.

Academic courses relevant to the project: 1. Financial Accounting2. Derivatives and Risk Management3. Security Analysis and Portfolio Management4. Business Analysis and Valuation5. Financial Engineering6. Financial Management.

PS-II Station:DBOI - Global Credit Ratings Team, Mumbai

Faculty

Name: Prof. Krishnamurthy Bindumadhavan

Student

Name: ORUGANTI LAKSHMI DHEERAJ(2017A1PS0901H)

Student write-up

Short summary of work done during PS-II: Analysing the annual reports of a given organization(case) and preparing a credit rating report such that the performance of that firm is briskly reflected for that particular financial year. This should also include the information about the firm, its current growth rate, past performance and performance w.r.t its competitors in that industry.

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

Objectives of the project: To learn about DB's internal credit rating methodology.

Major learning outcomes: Holistic view of a company's structure and strategy.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Very supportive team. Can approach anyone at any time for any kind of doubts. Try to do more number of cases thoroughly, minimize the errors and try not to repeat the same mistakes again.

Academic courses relevant to the project: FOFA, BAV, FM.

Name: SHYAMAL SHARMA(2017A2PS0830P)

Student write-up

Short summary of work done during PS-II: I worked in the reconciliation department of Europe rates team. In book running, a trade is recorded in both front and back offices. Ideally, they should be the same since they represent the same trade. But they often are different and have errors. Our work involved going through the files of both offices and check for the errors.

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

Objectives of the project: NA

Major learning outcomes: I got to know about the working of an Investment bank and hone my skills in excel.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is good. The seniors in the company treat you with respect and as their equal. They train you with different processes personally. Familiarity with Excel and Excel functions such as VLOOKUP and Pivot Table is a plus point as most of the work is done in excel only.

Academic courses relevant to the project: FRAM

Name: SIDDHARTH SAMBARU(2017A5PS1101P)

Student write-up

Short summary of work done during PS-II: Risk and PnL generation, revenue analysis and reporting, reconciliation of MAFA.

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

Objectives of the project: Understand the BAUs of the Europe Core rates business.

Major learning outcomes: Understand how the Europe rates business functions, how various stakeholders integrate to help smooth functioning of the bank, understanding the flows from front to back, how FO, MO and BO help to efficiently run the business.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Amazing working environment, my team in business finance were extremely supportive and helped me throughout the duration of the internship and honestly felt like a full time employee and a part of the team.

Academic courses relevant to the project: FinE, DRM.

PS-II Station:DBOI - Global Valuations Group, Mumbai

Faculty

Name: Prof. KrishnaMurthy Bindumadhavan

Student

Name: ROHAN MADHAVARAM(2017A4PS0722H)

Student write-up

Short summary of work done during PS-II: CPM and VSG dailies. Important dailies performed for the valuation of various assets and trades placed by the bank both for the bank and for the clients.

Tool used (Development tools - H/w, S/w): Excel, VBA, Sledge, Cartman.

Objectives of the project: To perform valuable services for the clients.

Major learning outcomes: Learnt how to value assets for clients and the bank and how valuation works in big investment banks.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Very good working environment, helpful colleagues, very friendly people even outside your own team, very accommodating towards new people especially Interns.

Academic courses relevant to the project: SAPM, FOFA, BAV, FRAM, DRM, FM.

PS-II Station:DBOI - Market Risk, Mumbai

Faculty

Name: Prof. Krishnamurthy Bindumadhvan

Student

Name: MEHENDALE DHANANJAY MANDAR(2016B1A30617G)

Student write-up

Short summary of work done during PS-II: My major work involved sending daily and weekly reports to the MRMs. I was responsible for investigating significant changes in the risk numbers in certain desks. In addition, I also worked on adhoc analysis as required. Using VBA knowledge, I managed to automate some processes.

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

Objectives of the project: Learnt how the risk management process works at leading Investment Banks.

Major learning outcomes: How risk management concepts are applied for risk reporting.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I was on WFH for the entire time of my PS. So, interaction with my teammates was limited to calls and skype chats. But, I found the team to be very friendly. They also encouraged & guided me to learn different software tools that would be useful to me as a professional.

Academic courses relevant to the project: DRM.

Name: N BHUVANA CHANDRA GUPTA(2016B2AB0960H)

Student write-up

Short summary of work done during PS-II: Daily risk validations on sensitivity movements, structural FX EC calculation, creating backtesting reports, deposit bucketing, working with tableau. A good balance of technology and understanding of risk numbers would be ideal.

Tool used (Development tools - H/w, S/w): Excel VBA (a lot), Tableau, Python.

Objectives of the project: Create a VBA Macro to validate the numbers in a report.

Major learning outcomes: Understanding how risk analysis space works.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Good environment.

Academic courses relevant to the project: DRM.

Name: PARTH GAUTAM(2017A8PS0711G)

Student write-up

Short summary of work done during PS-II: The work done during PS2 was mostly related to VaR calculation and find which year is showing the highest VaR no.s. This testing occurs on monthly as well as quarterly basis. Had to work with different stakeholders, trigger VaR, SVaR runs and share the results with respective teams.

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

Objectives of the project: VaR calculation and analysis.

Major learning outcomes: I learnt how things work in real life and worked upon different projects. Gained knowledge on how the team works and how to deal with different stakeholders. Triggered the VaR, SVaR runs on different market data, prepared reports, updated file versions, imported risk files.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The team, I worked with is really great. Everyone is nice, supportive and ready to help at any moment. Its been exciting journey and great learning curve for me. I worked on 4-5 different projects with my mentors. Looking forward to join the bank and advance my career.

Academic courses relevant to the project: Financial Management, Security Analysis and Portfolio Management, Fundamentals of finance and accounting, Derivative and risk management, Business Analysis and Valuation.

PS-II Station:Dell Technologies, Bangalore

Faculty

Name: Prof. Chetana Anoop Gavankar

Student

Name: ANSHUMAN MAHESHWARI(2019H1030508P)

Student write-up

Short summary of work done during PS-II: Worked on VxBlock 1000 (It is a converged Infrastructure solution to manage data centre). Where I create, automate, and manage workflows on VxBlock based Orchestrator to optimize and enhance existing Javascripts and also worked with Escalation team to resolve VxBlock related issues and manage their status on Jira platform.

Tool used (Development tools - H/w, S/w): VMware vSphere, Unisphere Manage, VxBlock Orchestrator, Packet tracer, Jira platform.

Objectives of the project: Enhance existing Javascripts and also handle query and issue related to VxBlock 1000 rose by onsite teams.

Major learning outcomes: Infrastructure development, Data centre products.

Details of papers/patents: No

Brief description of working environment, expectations from the company: VxBlock 1000 is an interesting product by Dell EMC. It is a ready made data center solution. Easy to install and has centralized management. VxBlock is not a single product. It is a result of clubbing different products together (like Cisco server for computation, Cisco Nexus Switches for Networking, Virtualization is done by VMware, Dell/EMC storage for Storage). Due to this, it provides learning opportunities of different domains like virtualization, computing, storage, networking. This team provided me with a variety of tasks to handle work on Jira platform to resolve tickets related to VxBlock, hands-on on various managing software like UCS manager, VxBlock vCentral, NX-OS, Packet tracer and exposure to automation workflow scripts etc and each task came with its own challenges. These challenges have pushed me to collaborate with others within the team. Moreover, all this will really help me with my endeavours in the future.

Academic courses relevant to the project: Networking courses, Cloud computing.

Name: YASHITA GOSWAMI(2019H1030521P)

Student write-up

Short summary of work done during PS-II: Redfish is a standard specification for server management, using REST service and data models. The project was to create a Redfish common utility module for the iDRAC that would perform various schema validations for different HTTP methods/Redfish requests and provide Redfish specification compliant error responses.

Tool used (Development tools - H/w, S/w): MTPuTTY, WinSCP, TalendAPI tester, C++, Python, Yocto.

Objectives of the project: To create a Redfish common utility module that would perform various schema validations for developers handling Redfish request.

Major learning outcomes: Redfish, Yocto, software development cycle in industrial environment.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Dell technologies have very good work environment. People are friendly and helpful. A mentor is assigned who throughout the project guides and thus helps in completing the project without any problems. Despite being remote working, there were intern peer group meetings every month which helped to interact with other interns as well.

Academic courses relevant to the project: Network engineering.

Name: KUNAL MANNA(2019H1400076H)

Student write-up

Short summary of work done during PS-II: The internship at Dell Technologies, Bangalore(Dell EMC) is quite structured. First few weeks involved general ramp up under hiring manager. After this interns in our batch were allocated to specific teams where the next one-two weeks involved team specific ramp up which also involved KT sessions. In my case I got to work with NetWorker product of EMC to take backup, perform restore etc. The KT sessions on NetWorker were helpful to get a brief understanding of NetWorker's operation. Dell handed over NetWorker development to HCL as part of transition. For the next project, I was part of SDNG team and worked with DDS API. I worked with senior engineer on logging functionality for

DDSD API and came up with macros/inline functions to replace conditional ENTRY/EXIT traces for logging. To successfully complete this task also required separating the APIs according to their functionality(backup/restore) and understanding the C code base for these APIs and relate with the flow. After this, I worked on two Power Protect Data Manager bugs for DDSD API. These bugs were associated with DDSD API's integration with PowerStore storage array. I gained significant exposure to debugging and code flow while working on these bugs. I was able to close off one bug. Second one was a bit complex bug which I handed over to senior engineer after my analysis. Lastly, I was allotted a JIRA story to add code for plugging a memory leak in one of the APIs. I closed off the story successfully by adding the code, testing it and getting it reviewed from senior devs.

Tool used (Development tools - H/w, S/w): Microsoft Visual Studio 2013, VIM Editor, Perforce P4V client, VMware vSphere web client, Beyond Compare, Bugzilla, JIRA, Review Board Tool, WinSCP.

Objectives of the project: Feature Implementation for DDSD API.

Major learning outcomes: I was exposed to industry-level production codes for the first time and able to contribute on a live project was truly a great experience for me. The transition from college to corporate was made easier due to this PS2 program. Along the way, I was exposed to many new tools/softwares that are used in a software development. Also just due to this PS2 program and project requirement here, I was able to learn JAVA. I was offered a PPO after the end of my internship as well.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: The environment at Dell Technologies(EMC) is very supportive. You can approach anyone right from the engineer level to senior manager level at any time and they will always be available to guide you. Moreover, the internship is very structured and they will take care of everything right from ramp-ups to project allocation. The projects allocated are related to data protection. Even though the internship was in a WFH mode, the timings are very flexible for interns. They just expect you to complete the assignments on time. You also interact with the US counterparts during team

meetings. The company only expects you to have good attitude towards problem solving and regular interaction with team members will help you develop as a professional.

Academic courses relevant to the project: Software for Embedded Systems, Udemy Courses on JAVA and Data Structures.

Name: ASHUTOSH KHARE(2019H1400077H)

Student write-up

Short summary of work done during PS-II: Learnt about various new technologies like - Virtual machines, Scripting, Postman, GO language, Git, Jenkins etc. and worked on the same. My work revolved around completing different tasks for Dell's new product - Power protect data manager. Mainly, each tasks deals with VMs, Network attached storages and their protection methodologies (like backup and recovery) and testing for these methods.

Tool used (Development tools - H/w, S/w): GO language, Shell scripting, Jenkins, POSTMAN, Jira, git, maven, VS code.

Objectives of the project: To work on different tasks related to backup and recovery of Virtual machines.

Major learning outcomes: Learnt GO language and to write well documented code.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: My whole PS was WFH and the communication with my team mates was very seamless. Each of them were very helpful during any doubts related to work. The work timings were very flexible.

Academic courses relevant to the project: Device drivers, RTOS.

Name: HIMANSHU MATHUR(2019H1400142H)

Student write-up

Short summary of work done during PS-II: I worked for Data Protection Division (DPD) and was part of BMR team. This team is responsible for BMR backup/ restore operations in multiple products developed by the company. During first two months, I went through the BMR implementation of existing product by debugging it multiple times and tried to gain the understanding of all the functionalities. After spending a considerable time on this product, my team asked me to contribute to the upcoming release of the next product. So during six months of PS, I wrote code in C++ adding some of the functionalities. It had very good exposure since from Day-1 and learnt lot of things.

Tool used (Development tools - H/w, S/w): Microsoft visual studio, Perforce, Jira, Confluence.

Objectives of the project: To achieve fast and efficient BMR backup.

Major learning outcomes: Efficient debugging, Setting up and configuring a virtual machine or build machine & writing an industrial level clean and optimized code.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: The team was extremely supportive throughout the PS period. I really enjoyed working with them.

Academic courses relevant to the project: C/C++ Programming, Data Structures & Algorithms, Device Drivers, Real Time Systems.

PS-II Station:Dell Technologies, Pune

Faculty

Name: Prof. Chetana Anoop Gavankar

Student

Name: MOHAMMAD ZEESHAN BEG(2019H1030020G)

Student write-up

Short summary of work done during PS-II: Development - A new product feature was added to give support for GCP services. Account creation/updation/deletion services have been added. Listing resources of the GCP account and allowing for on-demand snapshots was done. Audit of account related activities was also added to show what tasks were done and their respective status (completed/error/in-progress etc).

Design - As AWS and Azure platforms are already supported, help was taken from these services, control and data flow, UI design, front end user input checks and generating correct api-uri parameters were done.

Testing - The newly generated UI for GCP and dashboard have been tested for various screen sizes, browsers (Chrome, Mozilla and IE). Validations for user input on account creation/updating have been done. Responses from various api calls to the server have been tested to ensure correct information is displayed on UI.

Improvement in productivity and efficiency - As new preact Javascript library have been used replacing the older angular code, many api calls are reduced. Earlier many HTML, JS, CSS files were requested from server for a single view but Preact has reduced the number of these requests to 1 for each. This reduced the load time, memory usage and network bandwidth requirement to a minimum.

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

Language - TypeScript

Browser - Chrome, Mozilla, IE

Objectives of the project: Adding Google Cloud Platform (GCP) support for Cloud Snapshot Manager and refactoring the dashboard to use new Preact based components replacing older version in angular.

Major learning outcomes: Worked on code -

1. Production ready code is highly modular in design and structure. This is required for good readability and modifiability of code in future. Team members working on the same code can easily understand the purpose and internal functioning of snippets.
2. For UI, the HTML elements are wrapped inside custom components which makes it easy for re-use and modification to suit the context.
3. The JS version used (typescript) is open-source making it easy to use. There is a strict imposition of data structure on the objects used thus ensuring that only correct data formats are used.
4. The application brings under its control almost all possible use cases to make sure none of the conditions are unhandled when application is in use by the customer.
5. Comments are extremely important to help understand input/expected output of code snippets. Applications usually live for 10-12 years which requires proper transfer of knowledge from current to future team members.
6. Coding conventions developed should be strictly followed. This make it easy for other members to understand the semantics of variable names and function prototypes. Terminology related to product is easily understood making development faster and testing easier.

Worked as a team member -

1. Ask for help and be ready to help any time. Mistakes are unavoidable but learning and improvement are most important.
2. Time management is very important. Delaying work can cause problems as time might not be available later.
3. Conceptual understand of project is required before we start coding.
4. Keeping the data safe is very important. Many times machines failed during the development and data was lost. Committing any work done to remote repository is important.
5. Taking breaks from work can lead to relaxed mind and increases productivity. This also helps to come up with solutions to problems.
6. Look for solutions on internet. Ask team members and proceed. Also remember, they are also busy. Respect each ones time and work.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Organization of Team - Two distinct groups of people for - Front End, Back End.

Initially, a small assignment was given to bring familiarity with the tools used for the project. This helped me to understand what is expected of the project on a bigger scale. Teams were highly engaged with each other as in scrum process. Free flow of ideas among all members including the higher management concerned with the project. Weekly meetings ensured work is progressing in desired direction with good amount of work done. Challenges when encountered were resolved with help from members. Some were simple but some took around a weeks time to get resolved. Manager understood the challenges as we are working from home and its difficult to get other person immediately online. Sufficient time was given to understand the project. They were considerate enough to change the schedule for demo of project when I required some other urgent work. The technical lead was very helpful and open for any doubt session. Sometimes he even showed me the line number and function name that needs to be called. At other times, he would give me time to study the code and understand the concept and tools used on my own.

Academic courses relevant to the project: Research Practice - extremely helpful.
Networking - making api calls to remote hosts.

Name: SHAPATH MEHTA(2019H1030506H)

Student write-up

Short summary of work done during PS-II: Initially, I was told to learn about Node js and Golang which I required for my project, and the project was about enabling Google Cloud Platform support to Cloud Snapshot Manager(Dell Product), which previously had Azure and AWS support added. I worked on taking GCP on Demand Snapshot module.

Tool used (Development tools - H/w, S/w): Node js, Go, Postgresql, Knex js, Express, RabbitMQ, Redis.

Objectives of the project: To enable GCP support for CSM.

Major learning outcomes: Node js, coding and working in professional environment on a live project.

Details of papers/patents: No papers published during internship.

Brief description of working environment, expectations from the company: Dell has great learning environment and work life balance as well, team feels more like family.

Academic courses relevant to the project: DSA, DBMS.

PS-II Station:Development Consultants Pvt. Ltd., (DCPL), Mumbai

Faculty

Name: Prof. Pavan Kumar Potdar

Student

Name: KAVEER SHRIVASTAV(2019H1430606P)

Student write-up

Short summary of work done during PS-II: During my PS tenure, I got interactive with structural software StaadPro. By using this software, I modelled various structures in power plant and applied load on them effectively, also checked for reinforcement in drawing sheets with staad model is done.

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

Objectives of the project: To get through practical knowledge about work done in the field and applying academic knowledge to our power plant project.

Major learning outcomes: I learnt how to prepare Complain Resolution Sheet and checking for discrepancies between drawing sheet and design documents.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment is good in DCPL, the mentor explained each and every detail very nicely and provides all the relevant knowledge related to the subject.

Academic courses relevant to the project: RCC structures, Steel structures.

PS-II Station:DHIO Research, Bangalore

Faculty

Name: Prof. Glynn John

Student

Name: SUMIT KULKARNI(2019H1430608P)

Student write-up

Short summary of work done during PS-II: Initial days we went through the training of the Finite Element Analysis along with getting comfortable with the interface of the software, both Particleworks and ANSYS workbench. I have done validation of Particleworks software and ANSYS workbench. In ANSYS workbench particularly Static Structural Solver. Various problems involving Computational Fluid Dynamics, Heat transfer and Structural Mechanics.

Particleworks software is a Moving Particle Simulation (MPS) method based software which can simulate problems across various fields of engineering without involving the mesh generation unlike ANSYS workbench.

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

Objectives of the project: Validation of the Particleworks and ANSYS workbench.

Major learning outcomes: Finite Element Analysis, ANSYS workbench, CFD.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment was good but it could have been better. Few people responded very positively and encouraged us to get involved in the work.

Academic courses relevant to the project: Yes

PS-II Station:Dorsch Consult (India) Pvt. Ltd., Mumbai

Faculty

Name: Prof. Pavan Kumar Potdar

Student

Name: ANUJ GUPTA(2019H1410084H)

Student write-up

Short summary of work done during PS-II: The following tasks were assigned:

1. Preparation of Monthly Progress Report.
2. Preparation of Engineering Document Control Index for BGFCL.
3. Preparation of Detail Engineering Process Flow Chart of Oil and Gas.
4. Preparing Excel Sheet of Codes and Standards for the following discipline:
 - a. Mechanical Staticb. Mechanical Rotaryc. Pipingd. Electricale. Instrumentationf. Process
5. Comparing and Reviewing Detail Engineering Document with Basic Engineering.

Tool used (Development tools - H/w, S/w): Software's Used:MS Word, MS Excel, MS Power point.

Objectives of the project: The major objectives of this project are 1. To maintain the export gas pressure by installing wellhead compressors ahead of existing process facilities 2. To redistribute the compressed gas to the existing facilities as per their design condition to meet the export gas specification 3. To facilitate the transfer of separated condensate from the new facilities to existing facilities 4. To facilitate the transfer of separated produced water from the new facilities to existing facilities 5. To facilitate the vent and blowdown from new facilities.

Major learning outcomes: I tried to aggregate all the diverse work that I did during the course of my PS at Dorsch Consult India. In the theoretical background section, I gave a brief idea about the basics of the work carried out and to connect the theoretical knowledge with the current industry practices.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: Dorsch Consult is leading consulting organisation operating in various sectors like roads, highways, oil and gas, industrial projects and airports. One of the few on IT companies that continued to work remotely keeping in mind the safety of employees.

Academic courses relevant to the project: Construction Planning and Management, Infrastructure Planning and Management.

Name: JOSHI ADWAIT SUNIL(2019H1440158P)

Student write-up

Short summary of work done during PS-II: The work includes business development activities such as initial screening of active tenders and tender submissions. Along with this the tasks also included detailed design/drawing review and comparison with BEP, review of project schedule, research on Road Asset Management Systems and HDM4.

Tool used (Development tools - H/w, S/w): Primavera P6.

Objectives of the project: Business development, Review of documents submitted by EPC contractor.

Major learning outcomes: Tender submission procedure, Documents and drawings review procedure, Project scheduling.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: The deadlines can be overwhelming sometimes and it can become hard to keep up. Colleagues are very helpful with only few exceptions.

Academic courses relevant to the project: Construction Planning and Management, Infrastructure Planning and Management, Transportation Systems Planning and Management.

PS-II Station:Dr. Reddys Laboratories, Hyderabad

Faculty

Name: Prof. R. Bharathi

Student

Name: ISHAN MOITRA(2019H1460168P)

Student write-up

Short summary of work done during PS-II: Regulatory proposal for reduced testing for pharmaceutical products currently being manufactured in the unit FTO-3, wherein the possibility of skipping in-process analytical tests like assay, blend uniformity, loss on drying, residual solvent content etc. were checked using statistical methods like control charts and process capability graphs. Various statistical parameters like performance capability and process capability index derived from the analytical tests' data of 30 continuous and latest batches were analyzed, documented and reported to Regulatory Affairs unit for variation filing to regulatory agencies for various markets like USA, Europe, Russia etc. For products whose skip testing has been approved, their in-process analytical tests would be carried out for every 20th batch, hence manufactured after approval.

Tool used (Development tools - H/w, S/w): Software used – Minitab.

Objectives of the project: 1. Reduction in material cost incurred during analytical tests for batches whose skip testing has been approved, hence a reduction in production cost as well. 2. Diverting the manpower to other tasks. 3. Reduction of time in batch release.

Major learning outcomes: 1. Understanding the functions of Quality Assurance such as method/ process/ cleaning/ analytical validation, establishing guidelines for cGMP and GLP, in a pharmaceutical industry, change controls, audit, performance qualification, investigations, complaints etc. 2. Understanding the role of In Process Quality Assurance (IPQA) especially pertaining to sampling at in-process and finished product stage, OOS and OOT investigations, exception handling, line clearance etc. 3. Detailed understanding of the statistical basis of skip testing and how successful establishment of the same leads to conservation of time and money.

4. Various types of variation filing for regulatory agencies of Europe, USA, Russia, South Africa etc.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Dr. Reddy's Laboratories (DRL), Bachupally, Hyderabad campus is divided into various units. I was interning in Formulation Technical Operations 3 (FTO 3), in the department of In Process Quality Assurance (IPQA) under Quality Assurance (QA). I was well guided by the section employees, who patiently and courteously explained me the details of the project. I was allowed to learn at my own pace and given enough training to soon be able to handle data independently on a dedicated desktop. The periodic checks and reviews by section officers and head helped me minimize errors and keep me motivated during work. I felt DRL is a company that not only focusses on quality of products but also on the safe working conditions for its employees. Optimized working hours with sufficient breaks for meals and snacks, generous leave policies, and appreciation tokens keep employees motivated.

Academic courses relevant to the project: Pharmaceutical Biostatistics, Quality Assurance and Regulatory Affairs.

Name: GADE ASHISH DINKAR SUNITA(2019H1460627P)

Student write-up

Short summary of work done during PS-II: Pharmaceutical coating is an integral step in manufacturing of finished solid dosage forms like tablet and pellets. Coating improves the appearance, provides strength and patient compliance. Film coating is performed to improve the appearance of tablets. Film coating is not functional in nature like enteric or barrier coating but plays vital role in patient compliance and acceptance. During the coating process, numerous parameters such as spray rate, spray pattern, weight build up, pump RPM, etc. affects the coating. The objective of the project is to determine and identify the wastage in coating solution

and reduce down the wastage. This involves collection of runner products data from the Batch Production Records (BPR) and Manufacturing Execution System (MES), analysis of coating composition for runner products, studying the various parameters which affects the coating process and calculating and recording the quantity of solution prepared, consumed during the process and quantity discarded after achieving the targeted weight gain per tablet and development of strategies to reduce down the current wastage in coating solution. The expected outcome is reduction in coating solution waste for products where current wastage is around 20 percent of quantity prepared and optimize the quantity coating solution required for runner products. The identification, reduction and further optimization of coating solution beneficial to organization in terms of cost saving, regulatory compliance, patient compliance, and reducing the environmental hazard which occurs due to destruction of excess quantity of coating solution.

Tool used (Development tools - H/w, S/w): Excel, Power point, Ms office.

Objectives of the project: To determine and reduce the wastage in coating solution to minimize the cost and environmental hazard associated with various solvents and to improve regulatory compliance.

Major learning outcomes: 1. Beneficial to company in terms of cost saving, patient safety and regulatory compliance. Reduction of environmental hazard.
2. Thorough practical understanding about coating process and different stages of the same.
3. Understanding about coating process parameters and their impact on the coating process.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Fairly competitive environment which results in growth and development at personnel level.

Academic courses relevant to the project: Advanced Physical Pharmacy, Quality by Design, Quality Assurance and Regulatory Affairs, IPR.

Name: PURVI NEEMA(2019H1460628P)

Student write-up

Short summary of work done during PS-II: Prepared excipients risk assessment documents by using the template provided by Dr. Reddy's. The work required classification of excipients in low, medium and high risk categories on 3 bases: Excipient risk (further on 3 bases: Source of excipient, its functionality in the drug product, route of administration), supply chain complexity and quality management system of excipient manufacturer. Important component of the project is data collection which was done by using company's software like SAP and DocHub, company's confidential documents like Master Formula Record, Batch Manufacturing Record, Vendor Surveillance Assessment, Vendor Questionnaire, Supplier Questionnaire etc. along with literature survey for each excipient. Excipients Risk assessment was done for 66 categories for excipients. In total, 96 documents were prepared for 55 vendors including different categories of one excipient and also for different manufacturers of the same excipient.

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

Objectives of the project: To perform risk assessment for the excipients and further classification into low, medium and high risk categories and to prepare excipients risk assessment documents for each excipient. The project is applicable to all the excipients being used at all the manufacturing units of Dr. Reddy's Laboratories including external manufacturing

Major learning outcomes:

- Got thorough understanding of pharmaceutical excipients.
- Got insights to the documentation process in pharmaceutical company.
- Learnt to use software like SAP which are prevalent in many organizations.
- Prepared excipient risk assessment (ERA) on request placed by a MNC for which Dr. Reddy's was preparing products as 3rd party. Learnt how the requests are placed and how are they handled in company.
- Prepared ERA document for plant that Dr. Reddy's acquired from Wockhardt Ltd. Learnt how to bridge gap in documents during acquisition.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is amazing, I worked with Vendor Quality Management team. They were very supportive and understanding. The person superior to me was very enthusiastic and always ready to clear doubts. They allowed me to understand the project on my pace.

Academic courses relevant to the project: Advanced Physical Pharmaceutics, Dosage Form Design.

Name: SHREYA AGARWAL(2019H1470174P)

Student write-up

Short summary of work done during PS-II: The title of my project is "Nitrosamine Impurities in Active Pharmaceutical Ingredients (APIs) or Drug Substance." This impurity belongs to the class of mutagenic carcinogen and hence is of utmost importance to control its level in drug substances. The project involved understanding the regulatory requirements regarding testing for nitrosamine impurities in drug substances. According to European Directorate of Quality Medicines and Health (EDQM), the impurity assessment has to be done in three parts, i.e., risk evaluation, confirmatory testing, and changes in the manufacturing process. This project mainly focuses on the first two points. Risk assessment to determine the parameters responsible for the presence of nitrosamine impurity in the drug substance and determining the content of this impurity with the help of analytical tools like LC-MS/MS. Appropriate strategies to control the content of this impurity and maintain them within the limits are suggested so that they can be implemented for better process capability.

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

Objectives of the project: Objective of the project is to identify, characterize and quantify nitrosamine impurities in drug substances produced in the plant. The guidelines published by the health regulatory agencies to be followed and risk evaluation is performed to determine the root cause for the formation of the impurity. Also, the content of the impurity to be analyzed and

implement control strategies to minimize or control the level within the USFDA Acceptable Intake (AI) limit.

Major learning outcomes: Learnt about various sub-units in Quality Assurance. Worked closely with the site-investigation team to identify the probable causes of nitrosamine impurity formation. Got a vivid idea of how theoretical knowledge should be used to mitigate any out-of-specification issue during manufacturing process.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Chemical Technical Operations (CTO), Unit VI of Dr. Reddy's Laboratories is the largest API manufacturing plant. People there are enthusiastic and dedicated towards their work. They are supportive when it comes to guiding their juniors. Along with the technical team, the administrative team is always available for queries related to any matter. A lot of learning scope is there, but one has to look and ask for it.

Academic courses relevant to the project: Quality Assurance and Regulatory Affairs, Computer Aided Drug Design, Advance Pharmaceutical Chemistry.

Name: KIRTI REWARAM NANHE(2019H1470184P)

Student write-up

Short summary of work done during PS-II: Raw materials treated with solvents and chemically processed to synthesize Active Pharmaceutical Ingredients (API) and its intermediates. After synthesis, purification of API shall be performed to get pure API. After manufacturing of APIs, it contains impurities, API content, isomers, organic volatile impurities. To assess the content of API, number of impurities and amount of organic volatile impurities present in the API & its intermediates analytical method shall be developed. Analytical method validation shall be performed to check the performance of the analytical method developed.

Following method validation parameters (ruggedness, robustness, accuracy, method precision, linearity, LOQ & LOD, range, specificity) shall be performed as part of method validation. After completion of method validation analytical method shall be transferred to Quality Control laboratory. After completion of method transfer, analytical method shall be used for the testing & batch release of API & its intermediates. Methodology shall be used for validation of analytical test procedure for assay by HPLC, validation of analytical test procedure for related substances by HPLC, validation of analytical test procedure. Chiral substances by HPLC & validation of analytical test procedure for residual solvents by Gas Chromatography. Intended result shall be to deliver right method to the lifecycle of product & patient safety & meet the acceptance criteria given in protocol as per ICH Q2 (R1) guidelines. The results may vary depending on the route of synthesis adopted by the company. If the given API mentioned in Indian Pharmacopoeia, United States Pharmacopoeia & mentioned specific parameters then further validation need to be performed. While performing validation of analytical methods by HPLC & GC there will be challenges observed in system then that should be rectified after investigation with possible solutions.

Tool used (Development tools - H/w, S/w): MS word, MS Excel, Chemdraw, HPLC, GC.

Objectives of the project: To validate analytical method of assay, related substances & chiral isomers by HPLC & residual solvents by GC& study its method transfer for release of API& its intermediates. To demonstrate that developed analytical method suitable for its intended purpose. To check the reliability and consistency of a method so that developed analytical method used for the routine analysis in Quality Control laboratory.

Major learning outcomes: Analytical method validation parameters, method transfer, product quantity review, pH calibration, analytical balance calibration, HPLC calibration, GC calibration, preparation of impurity stock solution, blend solution & spiked sample solution, handling of handy step, performed data collection & compilation of Product Quality Review (PQR) of API. Involved in excel sheet updating of batch dispatch record.Contributed in Batch Product Record (BPR) scanning, stability studies data sheets collection from archival& AQA team & its scanning for regulatory filing.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It is manufacturing site, GMO (Global Manufacturing Organization) and is GMP regulated. Working environment is pleasant and good but due to GMP practices, interns are not allowed to perform the analysis. So here one can learn by taking theoretical project. Gaining practical knowledge from the analyst working in the lab and observing the work they are performing. Company expect that to obey the discipline and company policies. Give your best to learn in department where selected project.

Academic courses relevant to the project: Instrument method of analysis.

PS-II Station:Dristi Technologies, Bangalore

Faculty

Name: Prof. Akshaya Ganesan

Student

Name: VAIBHAV KULSHRESTHA(2015B1A30760G)

Student write-up

Short summary of work done during PS-II: I worked on multiple parts of the streaming pipeline (SP) - the software that is responsible for streaming the video feed from the factory floors and then running the deep learning on it. It is composed of multiple nodes, as you probably might imagine, that cause a non-zero latency in the system. One of my primary objectives was to measure and reduce this latency. Then, I worked on migrating their model runtime configurations from one API to another. This involved working on the CRUD operations associated with most APIs. Lastly, I worked on creation of BMN neural-network that can be used by the SP.

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

Objectives of the project: Optimise the latency in the streaming pipeline, port the model runtime configurations to the new API, and create a BMN for cycle detection.

Major learning outcomes: Python, object-oriented programming using Python, Kubeflow Pipelines, Grafana, and Google Cloud Platform.

Details of papers/patents: No papers or patents written / created.

Brief description of working environment, expectations from the company: Since the company is a start-up, the working environment is different and exciting. All the employees are friendly and willing to explain the concepts. The mentors try to involve the mentees in new and exciting project. Lastly, they listen to the mentees' feedback and are willing to incorporate the changes suggested. However, they expect the mentees to put in the work and you are frequently expected to have a workday of around 10 hours.

Academic courses relevant to the project: Neural network, Fuzzy logic and object-oriented programming.

Name: KAUSHIK MELLACHERUVU(2017AAPS0368H)

Student write-up

Short summary of work done during PS-II: The first project involves the improvement of one of Drishti's top manufacturing client's manual assembly line. The improvement of the cycle detection model in this particular station is based on improving the neural network model from a fully supervised learning method to a semi-supervised learning method which gives the same range of accuracy values with the benefit of lesser manually labeled data. The second project had the experiments that were performed using BMN (Boundary Matching Network) with various kinds of datasets and the implication of it on the labeling process and accuracy of this new

neural network used by Drishti. After this, there were model deployments done of this BMN model for various customers of Drishti and the protocol and challenges involved in the deployment process. The final project involved API related tasks, working on company's custom APIs and migration of few of the configurations.

Tool used (Development tools - H/w, S/w): PyCharm, Bash Shell, Python3, Kubeflow, Kubernetes, REST APIs, JIRA, Virtual Machines, Google Cloud Platform.

Objectives of the project: The objective of the first project was to deploy neural network model for one of the company's client using semi supervised learning with variational autoencoders. The objective of the second project was to deploy models as well as run experiments on BMN architecture. The objective of the final project was to work on the company's custom APIs and migrate few configurations that were involved in the machine learning pipelines.

Major learning outcomes: Machine Learning applications on industrial level, Model deployment of various Neural Network models for customers, internal architectures of APIs and softwares used.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Drishti Technologies is a fast growing ML/AI start up. The work environment was very good. The employees in the core team are very helpful and friendly. The tasks are distributed every sprint(15 days) and the core team expects you to finish most of the tasks, inform the team if there are any blockers and take their help finish the tasks. The timings are flexible, typical start up culture, one can work for 8-10 h/ day depending on their convenience. A very trendy work culture is followed with regular team meetings between the core team, engineering team and the whole company. It's a very healthy learning and working environment.

Academic courses relevant to the project: Machine Learning, Neural Networks and Fuzzy Logic, Object Oriented Programming.

PS-II Station:Dunzo Digital Pvt. Ltd., Bangalore

Faculty

Name: Prof. Anjani Koka

Student

Name: BHARAT DHIR(2017A8PS0656G)

Student write-up

Short summary of work done during PS-II: Sales process optimization using data analysis, CRM tools, SOP deployment, etc

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

Objectives of the project: Increase sustainable revenue for the organization.

Major learning outcomes: Sales management, data analysis, program management.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Good and flexible work environment, guidance is ample and accessible.

Academic courses relevant to the project: NA

PS-II Station:e-Governments Foundation, Bangalore

Faculty

Name: Prof. Sandeep Kayastha

Student

Name: SHASHWAT MISHRA(2016B1A30568G)

Student write-up

Short summary of work done during PS-II: My work at e-Governments foundation involved new feature implementations and bug fixes as per the user stories that were assigned to us on a sprint-wise basis.

Tool used (Development tools - H/w, S/w): Java, Spring, Flyway, PostgreSQL, Golang, JavaScript, ReactJS, JIRA, Git/GitHub, ElasticSearch.

Objectives of the project: Perform new feature implementation and bug fixes.

Major learning outcomes: Learnt about the best coding principles from security and efficiency point of view.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is really nice, employees are very helpful. Ideal for kickstarting career in software development.

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

Name: AKANKSHA MUDGAL(2019H1490867P)

Student write-up

Short summary of work done during PS-II: I have worked on two major projects and I am still working on two minor projects during my PS-II. My major projects were - (A) Project – Framework for measuring Impact, adoption, and efficiency e-Gov's open source platform DIGIT, however this was dropped after 1.5 months as it was already being done by other department.

(B) Project – Operations Plan – Marketing and Communications 2021

An Operations Plan – Marketing & Communications 2021 had already been developed and I am working on four aspects of it namely – Research and Advisory Organization (analyst relations), ethnographic research – storytelling, publications, influencer marketing. This plan and activities are all part of our Marketing drive 2021.

1) Research and Advisory Organizations - Through firsthand research, I came up with a list of such organizations, this is part of the analyst mapping part. Next, I started working on engagement.

2) Ethnographic research - storytelling - Stories are a universal language of sorts. I have done the background research, first understanding what is ethnography and ethnographic research. Then developing a meticulous report of ethnographers in urban governance ecosystem.

3) Influencer marketing - Influencers are the one to create and share original content that resonates well with our brand and their audience. Influencers can help signal to people in the audience that our work is important or interesting from a resource they already trust.

4) Media Outreach – Publications - Media outreach gives us the chance to pitch our content to people/media outlets who have a platform to share it with a wider audience. It has no limitations and might revolve around the press, social media networks, and popular blogs around the world.

Tool used (Development tools - H/w, S/w): My project was more about researching and engagement. No specific software was used in my project. Only to analyze the reach of website a few organizations - I used a software named Similarweb.

Objectives of the project: To spread brand awareness, increase brand value, make e-Gov stand out in our ecosystem and increase reach such that we are talked about more and more in the ecosystem.

Major learning outcomes: I learnt a lot about non-profit sector, urban governance, 17 sustainable development goals by the UN which are to be achieved by 2030 and various companies and its social divisions working towards it. I got to know the nuances of marketing, GTM and partnerships and how important it is for an organization. How to convert your several months long research into conceptualized themes for engagement for individual organizations and moreover, how to build strategic relations within and outside the organization.

Details of papers/patents: Not applicable.

Brief description of working environment, expectations from the company: Working environment - Even in the online mode, the response of my teammates was very heartening, they feel you connected. They provoke your thoughts and motivate you to do better and come up with new ideas and gives you freedom to implement them. I loved the working environment at e-Governance. They have already exceeded all my expectations. Just wanted to visit their office once which I will definitely like to do, if they allow me after things are normal.

Academic courses relevant to the project: Marketing Research.

PS-II Station:Eltropy, Bangalore

Faculty

Name: Prof. A. Vijayalakshmi

Student

Name: HASAN NAQVI(2016B5A70452P)

Student write-up

Short summary of work done during PS-II: I worked on backend development tasks. The projects I worked upon was the revamp of activity log and analytics. These were rewritten in

Golang. New functionality was added to them, and significant improvement in performance was done. Optimized SQL queries were written to fetch the data from postgres databases.

Tool used (Development tools - H/w, S/w): PostgreSQL, Git, Golang.

Objectives of the project: To revamp the existing activity log and analytics applications of Eltropy. The applications are being migrated from Groovy to Golang to improve their performance. Additional features are also being added to them during this revamp.

Major learning outcomes: I learnt about analyzing the query plans of the database, and how to use them to optimize the performance of the queries. Furthermore, I gained familiarity with Groovy and Golang. These were two new programming languages I learnt during the course of PS2. I also learnt on how to use various tools like Git to collaborate with my teammates while working on the same project.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work environment was friendly, the teammates were eager to help. The company expected interns to take initiative and work without too much mentoring. They were always open to listen to our ideas, and encouraged us to speak about any concerns openly.

Academic courses relevant to the project: Database Systems, Object Oriented Programming

Name: SUYASH RAJ(2017A7PS0191P)

Student write-up

Short summary of work done during PS-II: I worked on Eltropy's integration with EllieMae Encompass, a loan origination platform. My tasks included coming up with innovative solutions to fulfil the business requirements of the integration while ensuring smooth and frictionless user

experience. This took me across technologies both frontend as well as backend, as diverse as Golang, React and Dot net development. I collaborated with Eltropy as well as EllieMae subject matter experts to bring this integration to success. I was also responsible for two consultants and worked along with my manager, to assign them tasks, oversee their progress as well as coordinate their efforts and direct the process to close before the assigned deadline for the production release.

Tool used (Development tools - H/w, S/w): Golang, React, Dot Net, MongoDB, Postgresql, Jira, Jenkins.

Objectives of the project: Integration of Eltropy messenger into EllieMae Encompass.

Major learning outcomes: Golang, React, Dot Net, collaboration with a 3rd party, Management of external consultants.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The company has fast paced, achievement oriented environment. You're expected to set your own tasks daily at the beginning of each day. The employees are friendly, supportive and reachable at any time. Work hours(while working from home) are flexible and might extend beyond the conventional expectations. Hierarchy is not a hindrance in communication within the company.

Academic courses relevant to the project: Object Oriented Programming.

PS-II Station:Entrepreneurship Development and Innovation Institute, Chennai

Faculty

Name: Prof. Ramesh Venkatraman

Brief write-up on PS-II station: Following are the common expectations from the students across the PS Stations:-

- (a) Self-starter, Taking initiative
- (b) Be prompt, Responsive
- (c) Open to learn, Quick to learn
- (d) Ability to communicate effectively - Oral & Written

Student

Name: K DHAVAN(2016B1AB0653H)

Student write-up

Short summary of work done during PS-II: Built a conducive startup ecosystem in Tamil Nadu.

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

Objectives of the project: Identification of recent trends in Indian startup ecosystem.

Major learning outcomes: Recent trends in Indian startup ecosystem.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Good, encouraging and very friendly working environment. Company is willing to help students in all ways they can and student is given freedom to choose the project they are interested to work upon.

Academic courses relevant to the project: Public administration.

Name: SIMPI SALONI(2019H1490831P)

Student write-up

Short summary of work done during PS-II: Study about the startup ecosystem in Tamil Nadu. Conceptualized startup-to-Government Sandbox Initiative for providing test beds and pilot orders for startups in the Government. Implemented for Agriculture & Allied sectors and Assistive Technology with ecosystem partners. Handled “scaleup”-capacity building program for incubators. Selected 25 out of 81 incubators in the Tamil Nadu. Helped in improving the ranking of Tamil Nadu in comparison to other states according to guidelines given by SSRF, Govt. of India.

Tool used (Development tools - H/w, S/w): Google sheet, Google Docs.

Objectives of the project: Develop an ecosystem to increase the reach of startup TN and to increase the ranking of Tamil Nadu in state startup ranking.

Major learning outcomes: Excel skill, Understood the startup ecosystem, market research and project management.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment was great. The mentors were very helpful.

Academic courses relevant to the project: Public administration.

Name: SHIVAM MISHRA(2019H1490841P)

Student write-up

Short summary of work done during PS-II: Develop an ecosystem to increase the reach of startup TN among startups in Tamil Nadu. The goal of the project is to figure out how to reach maximum startups in various fields and get them onboard on the startupTN portal. How to make the whole process more users friendly. And act as enabler for different stakeholder in the ecosystem.

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

Objectives of the project: To develop an ecosystem to increase the reach of startup TN and to increase the ranking of Tamil Nadu in state startup ranking.

Major learning outcomes: Social Media Marketing, Project Management, Communication Skills, Negotiation Skills, Decision Making.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Good environment, Nice station to work for.

Academic courses relevant to the project: Project Management, Communication Skills, Negotiation Skills.

PS-II Station:Epsilon, Bangalore

Faculty

Name: Prof. Vijay lakshmi

Student

Name: ANKIT TIWARI(2019H1060126H)

Student write-up

Short summary of work done during PS-II: I done a project on recommendation system of subject line using machine learning.

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

Objectives of the project: Subject line recommendation using machinery learning.

Major learning outcomes: Machine learning, Recommendation system, Deep learning.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Best industry to work and learn.

Academic courses relevant to the project: DBMS, Data structures.

PS-II Station:Flipkart (Software Development), Bangalore

Faculty

Name: Prof. Vineet Garg

Student

Name: SHREYANSH GARG(2017A7PS1730H)

Student write-up

Short summary of work done during PS-II: I was responsible for migration of a core service to Kubernetes. Flipkart is moving all its apps to Kubernetes and as a part of that, I was assigned the task of migrating a app to production to Kubernetes.

Tool used (Development tools - H/w, S/w): Docker, Kubernetes, Helm.

Objectives of the project: Kubernetes migration of services.

Major learning outcomes: Learnt about containerisation, Docker, creating images using Docker. Deploying on Kubernetes. Creating CI/CD pipelines to automate the deployment process.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment was good, the team members were supportive and helped if we had any blocker. Interns are expected to deliver tasks which a SDE does, so it's a good learning experience. The work depends on team, overall it was a decent experience.

Academic courses relevant to the project: DBMS, Computer Networks, OOP.

Name: AYUSH LADDHA(2017A8PS0717H)

Student write-up

Short summary of work done during PS-II: Worked in the warehouse team of Flipkart to design and implement a reconciliation system for the team's microservice-based architecture. Worked on multiple projects which included - 1. designing and implementing reconciler 2. adding business tags to reconciled spans 3. providing tainted header support to request orchestrator. Finally, got a chance to be the first member in the team to deploy the application in production by using kubernetes and CI/CD pipeline.

Tool used (Development tools - H/w, S/w): Java, MySQL, Git, Jaeger, Hibernate, Kubectl, Spring Boot.

Objectives of the project: To design and implement a reconciliation system for the team's microservice-based architecture.

Major learning outcomes: Learnt about the need for reconciliation in microservice-based architecture and how a solution for it is designed, implemented, tested and deployed at scale.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Excellent working environment and culture, good guidance from mentors and very friendly team mates. Was a part of their sprints and had regular sync-ups to keep track of progress. Work environment is fast-paced and the developers are given complete ownership of the project.

Academic courses relevant to the project: Object oriented programming, Database management systems.

Name: KAJAL PARIKH(2019H1030016G)

Student write-up

Short summary of work done during PS-II: Worked majorly on Docker and Kubernetes migration of services, automating quite heavy, manual and error-prone tasks. Onboarded two of my teammates to the technologies.

Tool used (Development tools - H/w, S/w): Flipkart specific tools, Github, IntelliJ, Lens.

Objectives of the project: The main objective was to migrate all the services already deployed in VM world to Kubernetes world and automate tasks which were quite heavy, manual and error-prone.

Major learning outcomes: Acquired good knowledge on Docker and Kubernetes, which are very demanding technologies.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Environment was quite encouraging, learning-based.

Academic courses relevant to the project: Object oriented programming.

PS-II Station:Flyboat, Hyderabad

Faculty

Name: Prof. Sandeep Kayastha

Student

Name: AMAN SINGH YADAV(2016B2A10539G)

Student write-up

Short summary of work done during PS-II: My initial work started off with financial analysis to value a company's growth then it shifted to content design and marketing. My main work was to produce new and interesting posts to put on different social media platforms. Which transcended into managing new projects and designing content for various events and proceedings. This required a lot of research and brainstorming to come up with new and engaging ideas.

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

Objectives of the project: Design and Marketing

Major learning outcomes: Content Design and Management.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I was the only student who was allotted this PS so there was a lot of attention towards my group. My mentor and any other superior were all very helpful and understanding and paved a way for me to travel smoothly. My expectations were to deliver with more and more content so that the audience is kept engaging and I tried my best to keep up with that.

Academic courses relevant to the project: Object oriented programming.

PS-II Station:Future First - Financial Market & Research (Non-Quant), Gurgaon

Faculty

Name: Prof. Gaurav Nagpal

Student

Name: PRAGATI SINGH(2017A5PS1083P)

Student write-up

Short summary of work done during PS-II: As a financial markets analyst, I was supposed to research on the US and Europe energy markets, form trading strategies and trade derivatives.

Tool used (Development tools - H/w, S/w): Trading technologies, Excel, Tableau.

Objectives of the project: To trade the derivatives in the energy complex.

Major learning outcomes: I learnt about the energy complex and different trading strategies. I got to brush my Excel and Tableau skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work environment was very friendly. My manager and mentor were always reachable for help and guidance. Everyone was sincere about the work and it developed a sense of discipline in me.

Academic courses relevant to the project: Finance management.

PS-II Station:Genau Extrusions Ltd., Hosur

Faculty

Name: Prof. Glynn john

Student

Name: JAYAKRISHNAN R(2019H1410104G)

Student write-up

Short summary of work done during PS-II: A counter punch is used to remove the workpiece within the die during the cold extrusion process. It also acts as a load bearing member during the operation. The counter punch should have an average life of 3000 cycles. But in most of the cases, the punch got fractured at a rate below the average life cycle. The failure of the counter punch can be due to the higher hardness of the workpiece and excessive brittleness of the punch. This study deals with identifying the major cause of punch failure and steps to eliminate such failure. Study 2 is mainly concerned about identifying the root cause of failure of the tappet during manufacturing and study 3 is about finding an optimized tool surface which is locally adapted to the tool load by means of different methods like hard roller burnishing, surface treatment by laser and surface texturing.

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

Objectives of the project: To improve the life of counter punch used in cold extrusion process and to avoid tilting of tappet during manufacturing.

Major learning outcomes: Successfully improved counter punch life by 50%.

Details of papers/patents: None

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

Academic courses relevant to the project: Supply Chain Management.

PS-II Station:Genpact, Bangalore

Faculty

Name: Prof. Vimal S P

Student

Name: KUNAL RAJ VATS(2017A1PS0795P)

Student write-up

Short summary of work done during PS-II: First of all, I learnt about 'Algorithmic Pricing' in general - important concepts, evolution, industrial cases(Airline industry, Hospitality industry, and Retail industry). After getting a basic understanding of pricing algorithms, I chose a business case to work on i.e. 'Consumers end up paying more due to high-frequency pricing algorithms.' So, the goal that I tried to achieve here was to develop a pricing tool for the retailer/target firm to monitor weekly prices and volume for everyday grocery items. Through this, they can select the algorithm that gives the 'maximum revenue' for their particular business strategy, while also keeping 'consumer's interest' at hand.

I chose 2 food items – ‘yogurt’ and ‘salsa’ and 1 beverage – ‘beer’ as our products for which we made weekly price recommendations, estimated the weekly demand, and calculated the corresponding revenue generated. The algorithms that were used in the simulating product prices were 'Thompson Sampling', 'Q-Learning' (Reinforcement learning techniques), and 'Joint distribution-KDE' in python. Finally, I made a pricing tool on 'Power BI' for the retailer/target firm which helps them monitor Actual v/s Predicted (prices, volume, and revenue).

Tool used (Development tools - H/w, S/w): Microsoft Excel, Python, Jupyter-lab, Spyder, Machine learning, Reinforcement learning, Power BI.

Objectives of the project: Provide some improved gross revenue margin to the retailer/target firm on everyday grocery items like yogurt, salsa, and beer through the use of pricing algorithms, while creating a good consumer experience.

Major learning outcomes: Experience of working in a professional environment.

Importance of effective communication, teamwork and efficient planning.

Application of technical concepts to live problems.

I learnt how to own the task and work independently.

How meetings happen and deadlines are set.

I got a chance to improve my interpersonal skills.

I learnt Microsoft Excel, Python and ML,RL for data analysis and model building.

I learnt Power BI for building reports, dashboards & interactive tools for data visualization.

Details of papers/patents: A White-Paper on 'Algorithmic Pricing in Retail Industry'.

Brief description of working environment, expectations from the company: Mostly, the work was focused on New Product Development - creating a dynamic pricing tool that compared certain algorithms and implements the best one in that business case scenario. For the initial stages, some amount of research is required to understand the existing literature around the project and thus, develop a unique solution solving the chosen business case.

Academic courses relevant to the project: It is good to have knowledge of Principles of Economics, Supply Chain Management, Machine Learning. The mentors will guide properly and assign a project of your interest area and also help you with Python and ML.

Name: ROJIVADIYA PARI RAJESHBHAI(2019H1080038P)

Student write-up

Short summary of work done during PS-II: I was allotted a project entitled 'Time and motion study.' The purpose of the project was to identify business improvement opportunities. The employees of major FMCG client were contacted. I shadowed them while they were performing the tasks and note down each and every step of the tasks along with time required to perform. At the end step were analyzed and identified which can be automated and by doing so, all over time to perform the task can be reduced which lead to business improvement.

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

Objectives of the project: To identify business improvement opportunities.

Major learning outcomes: Collection of data, organization of data, analysis of data, preparation of report.

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. Genpact is well organized system with efficiently managed hardworking employees even in remote work. Every member of the organization was helpful and approachable 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.

Academic courses relevant to the project: Principles of Economics, Supply Chain Management.

Name: ABHINAV GAURAV(2019H1080177P)

Student write-up

Short summary of work done during PS-II: Data analysis for sales of product for 3 years and marketing strategy evaluation for client. Application development and QC,test cases writing procedures for QC.

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

Objectives of the project: Data analysis of sales and marketing dashboard and new application QC.

Major learning outcomes: Data analysis

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: It was work from home. Team was helpful and taught me a lot.

Academic courses relevant to the project: QARA.

Name: AAYUSHI CHAUDHARY(2019H1460165P)

Student write-up

Short summary of work done during PS-II: When I started my internship I was assigned training in health and life sciences and attended forecasting sessions to understand the project. After which I was assigned 3 projects 2 major and 1 minor. The 3 major projects were -market assessment for clients in which I mostly did secondary research and data mining in Microsoft excel and used epidemiology mode to calculate the potential patient population. I also made a report in which I wrote key take aways, represented collected data in different visualisations (graphs and tables), after interpreting the data and key take aways. I made assumptions about the market. For the other major project, I also used to update data and my report. In the minor project I was asked to research about LOE for 12 brands and erosion curves were made and applied in the sales data to get a most likely erosion curve forecast for client's product.

Tool used (Development tools - H/w, S/w): Microsoft office, power BI.

Objectives of the project: Secondary research and support forecasting for life sciences and health clients.

Major learning outcomes: I up-skilled my Microsoft skills and learnt power bi and how to draw insights and represent data, make reports. I learnt about pharmaceutical regulatory bodies such as PMDA and USFDA as well as how to do analysis.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I was a part of a small team. They were very encouraging and supportive. They guided me whenever I got stuck and kept motivating me.

Academic courses relevant to the project: Clinical research, IPR, Pharmaceutics, Biostatistics.

Name: ANKITA KUMARI(2019H1460631P)

Student write-up

Short summary of work done during PS-II: I worked on 3 projects during the course of this internship. One of which was based on web scrapping and sentiment analysis for Amazon product reviews using Python to find out the positive, negative and neutral reviews. And the other two projects were based on product sales forecast with various time series models using MS Excel and R programming.

For the first project, I identified a specific product category which was nutraceuticals. I selected different brands of Biotin tablets and then I did the web scraping. So with web scrapping, I was able to gather important data like product name, ratings, title and review. I used the BeautifulSoup library of python to carry out this task and finally exported that as CSV file and got 500+ reviews for sentiment analysis. And then for the next step, I removed the punctuations, and stop words and cleaned the data. I carried out text pre-processing and for that, Natural Language Toolkit (or NLTK), a platform for building Python programs to work with human language data, was used. Finally, using the TextBlob tool in Python, I got the polarity scores and subjectivity for each of the reviews.

For the sales forecasting projects, I did the initial statistical analysis using MS Excel, I tried several models on Excel, like exponential smoothing, simple moving average, weighted moving average etc. Then used the 'tseries' library of R to carry out several models on R. I also did the decomposition of the series to know the trend, seasonality etc. Finally, I used 'auto ARIMA' and 'SARIMA' models to fit the data. The SARIMA models gave the best fit.

Tool used (Development tools - H/w, S/w): Python, R Programming and MS Excel.

Objectives of the project: The first project was based on web scraping and sentiment analysis for Amazon product reviews using python to find out the positive, negative and neutral reviews. The problem statement for the second project was to carry out product sales forecast with various time series models using MS Excel and R programming.

Major learning outcomes: 1. Statistical analysis in MS Excel2. Running several time series analysis models for forecasting in R 3. Carrying out web scrapping using Python to extract important data from an HTML page4. Sentiment analysis using Machine Learning to understand how a product is being perceived and accepted by the customers.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Due to pandemic, the entire internship was WFH basis. However, from the initial trainings to attend meetings and discussing the projects with the managers, everything went on very smooth. I was given the weekly targets and had meetings twice a week to track my progress. It was all very comfortable and well managed. It was due to this effective scheduling that I was able to complete my projects ahead of the deadline. Overall, I had good experience at Genpact.

Academic courses relevant to the project: The forecasting project was relevant to the Pharmaceutical Management course that we had in the third semester. But, I only had preliminary knowledge about forecasting before, after working on real projects I got to expand my horizons of knowledge and idea.

Name: ABHIJEET NAIR(2019H1460632P)

Student write-up

Short summary of work done during PS-II: Use various social media sites like Facebook, twitter and gather consumer insights for the product by learning through there conversation through software called Brandwatch.

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

Objectives of the project: To get consumer insights for the product.

Major learning outcomes: How company use consumer social media feed to gather insight for the company for product marketing.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: A good atmosphere for work though WFH was there due to pandemic but working hours were quite reasonable.

Academic courses relevant to the project: Pharmaceutical Management.

PS-II Station:GenY medium, Hyderabad

Faculty

Name: Prof. Anjani Srikanth Koka

Student

Name: BAHETI SHIVAM NARAYAN(2017A4PS0575P)

Student write-up

Short summary of work done during PS-II: Basically, I have worked directly under my senior managers to take care of the brands that we handle. Wakefit, Ola Cabs, Breathe-well-Being are some of the brands that I handle. The brands that I handled (projects) were one of the top-performing ones for the company and hence the most important as clients.

Tool used (Development tools - H/w, S/w): Google Analytics, Google Adwords, FB Ads Manager, Display & Video 360, Double-Click Manager, Apple Search Ads Manager, LinkedIn Ads Manager, SEO SEMRush, SEO Moz, etc.

Objectives of the project: The project was broadly based on digital marketing. To market the clients' products/services digitally was the primary objective of the project. Analysis and optimization of the clients' campaigns was also the prime task.

Major learning outcomes: To work under deadlines, tackle complex MS Excel formulas, setup new campaigns for the client, extensive use of Excel and direct communication with the clients.

Details of papers/patents: NA

Brief Description of working environment, expectations from the company: Working environment was very good and flexible, majorly due to the pandemic. The company has allotted me some of their important & top-performing clients(projects).

Academic courses relevant to the project: Principles of Management.

PS-II Station:Goldman Sachs - Investment Banking, Bangalore

Faculty

Name: Prof. Siddarth Misra

Student

Name: SARTHAK GOEL(2016B3A70334G)

Student write-up

Short summary of work done during PS-II: Working on excels, decks and profiles for mergers and acquisitions of clients in the investment banking division of Goldman Sachs in the consumer-retail group of EMEA region.

Tool used (Development tools - H/w, S/w): Excel, Powerpoint and Word along with internal databases, knowledge management tools and add-ins.

Objectives of the project: Investment banking specific model setup.

Major learning outcomes: Learnt about mergers, acquisitions, and finance roles with an understanding of analyst role in investment banking. Worked on reports, profiles and decks for the same.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is challenging, people are very helpful, sweet and nice but the hours are very very challenging. But exposure to the great people, London office and VPs is a pro.

Academic courses relevant to the project: Business Analytics and Valuation, FuFA, FinMan and other Finance minor courses.

PS-II Station:Goscale Technologies Pvt. Ltd., - Digital Marketing, Bangalore

Faculty

Name: Prof. Ramesh Venkatraman

Brief write-up on PS-II station:Following are the common expectations from the students across the PS Station:-

- (a) Self-starter, Taking initiative
- (b) Be prompt, Responsive
- (c) Open to learn, Quick to learn
- (d) Ability to communicate effectively - Oral & Written

In GoScale, we had 2 interns during this PS-II. Both of them have done so well meeting the expectations of their Mentor(s). GoScale has requested for interns for the next semester also. Course Requirements & Tool Requirements: 60-70% of the students (around 10 out 15), were working on Digital Marketing during this PS-II. It would be good if they have undergone a basic course in Digital Marketing and had some introduction & hands-on in the tools used in Digital Marketing.

Student

Name: ESHITA SHUKLA(2019H1490813P)

Student write-up

Short summary of work done during PS-II: Working as a digital marketing intern at GoScale technologies, I was accountable for paid marketing efforts of the firm. I got the responsibility of launching digital marketing ads to generate leads. We used Google ads and monitored our performance on it. During my internship, I handled two products account and one Google MCC account. I was responsible for writing attractive ads and doing keyword research and planning

the bidding strategy. As part of marketing team, I also got the opportunity to work on new initiative of community engagement, content marketing and social media management.

Tool used (Development tools - H/w, S/w): Google ads, Google analytics, Semrush.

Objectives of the project: 1. Devising Social Media Strategy: A wide range of strategies for branding purposes significantly improving crewscale's social media presence and search engine optimization. It includes research regarding hashtags and when to post on different social media platforms 2. Content Marketing: Creating and distributing meaningful, influential and reliable content to attract and maintain an identified audience and eventually drive profitable consumer action 3. Campaign Optimization: After the campaign launch to continuously monitor the campaign's performance and make the necessary changes to boost its success 4. Community engagement: Actions to make a customer-centric brand growth strategy that focuses on bringing consumers together around a topic aligned with or directly linked to brand in an engaging and non-intrusive way 5. Ads Formulation: I was responsible for making ads through effective copywriting. Ads are changed weekly. I had created more than 100+ ads 6. Keyword Research: Any online marketing campaign starts with keyword analysis. Before launching a new ad group, it is necessary to determine what the target audience is looking for and what it will take to rank for those terms.

Major learning outcomes: I got the opportunity to implement the theoretical learning which I had while studying marketing during my MBA. Apart from the technical skills, I also learnt that soft skills such as working in a startup helped me voice my opinions and ideas and participate in brainstorming sessions.

Technical learnings: As a digital marketing intern, I gained knowledge, creativity and business skills needed to market a client's brand successfully.

I have built the following skill-set: Performance marketing and PPC campaign strategy, Innovative solution for product launch marketing, Social media content creation, Social media management, Knowledge of Google ads implementation, Native advertising and LinkedIn campaigns, Use of google analytics proficiency at social media post designs using online tools and experience in executing digital marketing campaigns for brands.

Other learnings: Remote work ethics, Time management, Teamwork, Problem-solving, Interpersonal skills.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment was friendly and creative freedom was given.

Academic courses relevant to the project: Advertising and sales promotion, Digital marketing, Brand management.

Name: RADHIKA GUPTA(2019H1490844P)

Student write-up

Short summary of work done during PS-II: Worked as a digital marketing intern and was involved in community building & management on different social media platforms, assisted in testimonials video making for the company from the developers on boarded, formulating & execution of promotional and engaging strategies for all the social media platforms, podcasts promotion, content creation, lead generation, marketing research.

Tool used (Development tools - H/w, S/w): Phantom Buster, Ms Excel, Google Sheets, Docs, Powerpoint, Powershell, Notion, Get Prospect, Google Analytics.

Objectives of the project: Brand Promotion, Lead Generation, Brand Positioning & management, Community Building.

Major learning outcomes: Working in Teams, Soft Skills Development, Communication Skills, Content Creation Skills, Product Launch tactics, Pressure Handling, Objection Handling,

Details of papers/patents: No papers/patents.

Brief description of working environment, expectations from the company: The company culture was very helping & friendly, with a lot of learning opportunities, Co-founders are easily approachable with excellent mentorship & leadership skills.

Academic courses relevant to the project: Product & Brand Management, Marketing Research, Business Communication, Organizational Behaviour.

PS-II Station:Granules India Ltd., Hyderabad

Faculty

Name: Prof. R. Bharathi

Student

Name: PATEL MEHULKUMAR PRAVINKUMAR(2019H1080537P)

Student write-up

Short summary of work done during PS-II: I was associated with formulation research and development department of Granules India Ltd, Hyderabad. Involved in the formulation development and evaluation of oral solid dosage forms. Worked on various aspects related to formulation and development of delayed release tablets. Development of formula for further implementation in scale up and exhibition batches. Did online course of NPTEL Swayam course on biostatistics and design of experiments which was suggested by the mentors.

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

Objectives of the project: To understand the methodology of developing a formulation of a delayed release tablets.

Major learning outcomes: Overall methodology of formulation development and evaluation of solid dosage forms. Gained knowledge about how equipment works and how they can be handled. A thought process that how to make a decision of certain problems as well as working as a team.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The company has good environment for the fulfillment of the required project. They have well equipped research laboratory and a supportive management. I was expected to take an active part in the project allotted to me. To be disciplined and be a good team player. Apart from that being a regular person and should be following the rules of the industry.

Academic courses relevant to the project: Advanced Physical Pharmaceutics, Quality Assurance and Regulatory Affairs, Quality by Design, Dosage forms Design.

Name: SIDDHARTH SRIVALSAN(2019H1470173P)

Student write-up

Short summary of work done during PS-II: I've performed reactions, worked on forming a novel polymorph and isolating a desired enantiomer of a drug. I've worked with the API R&D department for my lab activities. During my PS-II, i've also enrolled in the NPTEL online course of biostatistics and the design of experiments. I've worked on internal assignments like therapeutic classification assignments which dealt with the SAR of chemical structures.

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

Objectives of the project: To isolate the desired enantiomer and obtain a novel polymorph of the drug belonging to the company.

Major learning outcomes: Learnt on many reactions, crystallization processes, methods on obtaining a novel polymorph, methods to isolate a desired enantiomer.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: The working environment is filled with lots of learning opportunities as the company has lot of experienced leaders who are ready to lend a hand on daily operations and answering queries on using any of the company equipment. Everyone in the company facilitates a helping hand and is open to any sort of question regarding a process or product. The company does keep rules to follow for own safety which everyone adheres to. The company expect every individual to cooperate to the daily norms and follow all safety instructions especially during these times. They expect good communication between fellow workers to incorporate a better understanding and mutual respect between employees and other project trainees.

Academic courses relevant to the project: Pharmaceutical Chemistry, Pharmaceutical Biostatics, etc.

PS-II Station:Groww - Software Development, Bangalore

Faculty

Name: Prof. Akanksha Bharadwaj

Student

Name: PRATIK(2016B4A70549H)

Student write-up

Short summary of work done during PS-II: As part of the front-end team, worked on the iOS App development for (Groww App). React Native, Google Firebase was used for the development purpose. Worked on development of a new referral system to increase stocks on-boarding, reduced customer success team workload by developing a feature to check for duplicate tickets raised by the users. Other major features include pan geo-tagging, ticket escalation, update KYC features etc.

Tool used (Development tools - H/w, S/w): React Native, Typescript, Chrome Debugger, Webengage, Bugsnag, Google Firebase, Git.

Objectives of the project: To develop iOS App to make it easy for the users new to the investing platform to onboard, learn and invest in mutual funds, stocks and gold.

Major learning outcomes: iOS App development using React Native / TypeScript, Google Firebase. Working in team with App release deadlines as well as working on on-call issues.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Great learning environment. Team members are very helpful. Weekly code / design and product reviews to share your work with others and get useful feedback for improvement. Teams open to new ideas both on product and tech level. Given the tasks same as full time employees with full ownership of your product and the deadlines was strict for the critical features.

Academic courses relevant to the project: Object oriented programming, Software development.

Name: SUHAS PRASANNA(2017A7PS0002G)

Student write-up

Short summary of work done during PS-II: Most modern services run on cloud computers which are provided on a more or less permanent basis, but are expensive for the same reason. To reduce these costs, we can opt for machines which are provided via a temporary pool and are hence much cheaper. However, this comes with several issues in terms of ensuring that services don't get interrupted during critical flows and that services can be allocated even when this temporary pool is exhausted. Work was done to solve these issues, the solutions included adding node termination handling and traffic routing using Istio.

Tool used (Development tools - H/w, S/w): Kubernetes, Istio, Helm Charts, Jenkins.

Objectives of the project: To reduce the costs on the cloud infrastructure.

Major learning outcomes: 1) Understood how cloud infrastructure works at modern companies2) Understood in detail and also operated on kubernetes3) Understood and operated on Istio on kubernetes.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment was through an agile team that worked in sprints. Big goals were sub-divided into specific tasks to execute every sprint. There were no strict deadlines to accomplish things, but the company set general expectations on when work can be completed and quality of the work.

Academic courses relevant to the project: Computer networking was helpful for a broad level understanding of cloud infrastructure.

Name: BHARATH S(2019H1030017G)

Student write-up

Short summary of work done during PS-II: I worked on two different tasks during my PS-2 both of which involved using kotlin (Android development) to change the reset password flow and to help develop the option chain feature for options trading using Android studio. It was a great and challenging experience. The people are really helpful and knowledgeable.

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

Objectives of the project: Modify and build features of the groww App.

Major learning outcomes: Learnt Kotlin, Agile development methodology, Android concepts and its real world implementation.

Details of papers/patents: No

Brief description of working environment, expectations from the company: Since, it is still a growing startup, the working environment is great, challenging and rewarding. Everyone here is customer driven and hardworking and they try to reach the customer's requirements with all their effort. You can approach anyone in the entire company to clarify your doubts.

Academic courses relevant to the project: Object Oriented Programming, Pervasive Computing(Android).

PS-II Station:Harness, Bangalore

Faculty

Name: Prof S. P. Vimal

Student

Name: SUJAY C SHARMA(2017A7PS0012G)

Student write-up

Short summary of work done during PS-II: I worked as UI developer for the CDC (Continuous Delivery Core) team. This team deals with CD features that are general across various deployment types.

Work done on three main fronts:

- 1) Bug fixes/CFDs
- 2) Quality enhancements
- 3) Feature work

Bug fixes/CFDs:

- (i) Resolving couple of RBAC related issues
- (ii) Fixing UI issues in new custom dashboard component
- (iii) Fixing duration field in deployment details
- (iv) Participating in weekly bug bashes

Quality enhancements:

- (i) Create more specific snapshot matches using Jest
- (ii) Improve UI code coverage by adding unit tests
- (iii) Improve loading time of an API call
- (iv) Add field level validation for workflow steps

Feature work:

- (i) Runtime inputs
- (ii) Error handling enhancements
- (iii) Add auto-selection of pipeline stage feature
- (iv) Add automatic update of executions on deployments page

Tool used (Development tools - H/w, S/w): React, Jest, Javascript, HTML, CSS, Git.

Objectives of the project: Contribute to the continuous delivery product of harness and get an experience of working as a part of a team on existing and new features.

Major learning outcomes: This internship has provided me with a tremendous opportunity to hone both my technical and non-technical skills. It has given me an insight into the workings of a fast-paced work environment where people constantly strive to better themselves. I learnt about how to write production quality code while becoming well-versed with various tools and services that form a part of the ecosystem of a software developer at one of the fastest growing companies in the world. It has provided valuable experience in taking complete ownership of my work from start to end. I learnt skills in many different aspects starting from web development in React to analyzing UI code using Chrome developer tools to write unit tests in Jest and also collaborating with others using GitHub, Jira and Slack. Beyond all of this, working on the world's

first continuous delivery as-a-service platform has enabled me to gain knowledge in one of the most in-demand and vast domains of DevOps. Finally, it has taught me how to solve numerous challenging problems over the course of my internship thus preparing me well to rise to the challenges that may lie ahead in my career.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Participate in all the activities of the CD-Core team and get an experience similar to a full-time employee at the company. Expectations involve taking complete ownership of the tasks given in terms of bug fixes, feature enhancements and development of new features. Also, expected to attend daily standups, bug bashes and other team meetings.

Academic courses relevant to the project: OOP.

Name: SRI HARI CHIDELLA(2017A7PS0070G)

Student write-up

Short summary of work done during PS-II: The project worked on for the majority of the internship is Git Experience. Work included design and implementation of APIs using Dropwizard, Spring to communicate with Mongo repositories, MongoDB to query from DB etc.

Tool used (Development tools - H/w, S/w): IntelliJ, Java, Spring, DropWizard, MongoDB, Postman, BloomRPC, Junit.

Objectives of the project: Developer experience teams works on the next gen dev ops capabilities like Git Ops and template library. This feature helps the developers to manage their infrastructure and deployment using files in Git. We also work on an error handling framework which will help the developers who are using harness to easily onboard harness.

Major learning outcomes: Backend engineering in Java, API development using DropWizard, Database management using Mongo.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Work is very exciting and new and tech stack is great. You get to know something new every day and there is lot to learn. People are highly motivated and always willing to help.

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

Name: SRI PARDHA CHIDELLA(2017A7PS0953G)

Student write-up

Short summary of work done during PS-II:

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

Objectives of the project: My project is focussed on improvement of the continuous delivery platform at Harness through integration of new features, improving quality and reliability of existing code, resolving bugs and problems as and when necessary.

Major learning outcomes: Contributed towards rolling out various new features in varied fields such as delegate selectors, GraphQL based infrastructure and automation for various Harness entities. This project provided me great insight into the work of software developer in the IT industry. I got familiarised with various new technologies that are extensively used in the industry. Also got experience in presenting my work to colleagues as part of monthly feature presentations.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Helpful teammates who are willing to take time out to help you in understanding things. Fast paced work.

Academic courses relevant to the project: OOP, DBMS.

PS-II Station:HCL Technologies Ltd., (Formerly Geometric Ltd.,), Mumbai

Faculty

Name: Prof. Pavan Kumar Potdar

Student

Name: DEEPAK ARJUN GADAKH(2019H1420139P)

Student write-up

Short summary of work done during PS-II: The document file output from the CAMWorks is difficult to understand. The file consists of all information from all the operation used to make any part. Therefore it is very difficult to find any relevant information on it. Thus this work has the potential to make the life of machinist easy. In the end, we are expecting faster and reliable information extraction system. There will be working with all operation and all kind of machining process. This project has structure to extract the relevant data form any class and a way to display the information on the UI. Machinist will be able to interact with the interface, and copy any data from that.

Tool used (Development tools - H/w, S/w): Visual Studio 2017 and 2019, Solidworks, CAMWorks, C++ fundamentals and OOPs concepts, MFC, MS Excel 365, Tortoise SVN, Notepad++.

Objectives of the project: Time reduction for user, flexibility, more control to the user, productivity improvement and better understandability.

Major learning outcomes: Languages / concepts learned-C++ fundamentals and OOPs concepts, MFC.

Skills developed-Coding skills, communication skills enhanced, corporate ethics, corporate report making and presentation skills enhanced and time management.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The company has a great work culture and great learning experience. The company's employees are very polite and helpful. We can connect with the employees any time, and they will guide fully as soon as they are available. They treated me as a full time employee, but there was no pressure to do the job in right way, they expected me to learn and grow. The work was from the home, so the time adjustment was not a problem.

Academic courses relevant to the project: Product design.

Name: SHIVAM SAMAIYA(2019H1420598P)

Student write-up

Short summary of work done during PS-II: 1. Developed the concept for the algorithm to compute removed volume for multi-axis feature CAD models for CREO 7.0. Wrote all the sub sections of the algorithm which will eventually get integrated by senior developers of the team DFMPro.

2. Labelling of parts for identification of manufacturing process- worked on automation of extraction of important features, parameters from CAD model into csv to use them for identification of manufacturing process.

Tool used (Development tools - H/w, S/w): Visual Studio 2012,2015,2017, 2019; CREO parametric 4.0.0 and 7.0.2.0; MS Excel 365; Geometric DFX; Cloud space.

Objectives of the project: The project aims to develop an algorithm that can compute the volume removed from an initial workpiece to obtain multi-axis features i.e. how much value was removed from the initial (cuboid, cylindrical specimen according to manufacturing process) specimen so that multi-axis features that the designer want can be created. The scope of this project (algorithm) is throughout the DFMPRO product. Currently, this algorithm is created for the CREO 7.0 version but when built successfully, this algorithm will be implemented throughout the CAD versions where DFMPRO works as an addon (Solidworks all versions, NX all versions, CREO all versions) as cost module of DFMPRO works on all of the CAD software.

Major learning outcomes: 1. Learnt concepts of software development 2. C++ and OOPs concepts 3. Automation concepts (batch scripting/ command line applications) 4. CREO APIs (ProToolKit) 5. Algorithm Building 6. Computer Graphics concepts.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: I was assigned to DFMPRO team. Work environment was very supportive and friendly, you can contact anyone in the team right from software engineers to general managers and they will answer your queries with most polite way. I was not aware of software development working or environment but my RM helped me to learn and implement them. For someone who has mechanical background and interested in software development, this will be the dream job.

Academic courses relevant to the project: C++ basics, Algorithm and data structures. Product design.

Name: YAGANTI SASIDHAR REDDY(2019H1420603P)

Student write-up

Short summary of work done during PS-II: Usage of AI ML in CAD domain for recognition of features of Multi axis parts. Here the main aim was to reduce the dependency of C++ based algorithms for feature recognition and instead use ML techniques by training the models to perform with utmost accuracy in feature identification.

Tool used (Development tools - H/w, S/w): Google collaboratory, Visual studios(C++), Tortoise SVN, Araxis Merge, Microsoft Excel.

Objectives of the project: Tagging the features of Multi axis parts correctly with AI ML algorithms.

Major learning outcomes: C++, Python, AI ML.

Details of papers/patents: One patent is about to get filed in the project(Usage of AI ML in CAD domain).

Brief description of working environment, expectations from the company: Working environment is good and I got insights into how IT environment functions. As the company is related to CAD/CAM development, I was expecting good exposure into that area of how exactly the C++ algorithms function to tag the faces correctly and how the systems function and how well can solutions proposed be integrated into their systems. All these were taught well during my tenure as management intern.

Academic courses relevant to the project: CAD/ CAM application development will be requiring the knowledge of coding (C++) and AI ML.

PS-II Station:Hertztech Solutions Pvt. Ltd., (HTS) - Engineering Content Development, Chennai

Faculty

Name: Prof. Glynn John

Student

Name: CHINTA SAI SRAVANTH(2019H1410144H)

Student write-up

Short summary of work done during PS-II: Creating high quality animated videos for each topic in strength of materials.

Tool used (Development tools - H/w, S/w): Blender 2.92, Synfig Studio, Animaker Voice, Da Vinci Resolve 17.

Objectives of the project: 1. Creating high quality videos for each and every topic in the subject 2. Breaking down the problems into steps and explaining the thought process needed to solve the problems.

Major learning outcomes: 1. Creating animated videos 2. Video editing 3. Story narration (speech/voiceover) 3. Concept visualiztion.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Work from home. Expectations from the company are that you perform your work in a timely manner, set realistic goals, plan towards them, then execute, and aim to meet your deadlines etc. Since you set them yourself, you should have no problems meeting them. Allows certain degree of freedom, but also great work culture, very helpful team members, variety of internal resources and documentation to help guide you.

Academic courses relevant to the project: Strength of Materials/ Mechanics of Solids.

PS-II Station:Hexanika Pvt. Ltd., Pune

Faculty

Name: Prof. Sudeep Kumar Pradhan

Student

Name: PRAKHAR GOYAL(2019H1410589P)

Student write-up

Short summary of work done during PS-II: Implementing data science techniques and ML algorithms in some of the projects that are relevant in the field of financial services. One of the key projects was to build a classification supervised model for predicting the loan acceptance using dataset provided by the financial regulators.

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

Objectives of the project: 1) To predict the “Action Taken” within the testing dataset or loan application register 2) To utilize the CFPB historical data, data publication API to train the model 3) The testing dataset can be the loan application register.

Major learning outcomes: 1) Improved some of the important skills required to excel in the field of data science and data analytics 2) Relevant exposure where knowledge gets integrated with the industry specific expertise.

Details of papers/patents: Blog on one of the project- <https://hexanika.com/the-use-of-ai-ml-for-proactive-self-evaluation-of-data-submitted-on-hmda-capturing-the-change-using-model-based-on-cfpb-published-data/>

Brief description of working environment, expectations from the company: The working environment was very professional and the reporting manager was encouraging where every idea was recognized and credits were given wherever due. The culture was welcoming where all the Interns were given excellent exposure.

Academic courses relevant to the project: Data Science, Machine Learning, Product Design.

PS-II Station:Hindustan Colas Pvt. Ltd., Mumbai

Faculty

Name: Prof. Pavan Kumar Potdar

Student

Name: RISHIKESH MALLADI(2019H1300070H)

Student write-up

Short summary of work done during PS-II: I Prepared two types of Bitumen Emulsions and stabilized the aggregates which were graded according to WMM layer using emulsions that I've prepared and tested the stabilized aggregates for Indirect Tensile Strength and Resilient Modulus.

Tool used (Development tools - H/w, S/w): ITS apparatus, UTM and several other testing apparatus.

Objectives of the project: To compare the strength of untreated WMM layer and stabilized WMM layer.

Major learning outcomes: Strength of emulsion stabilized WMM layer is much higher.

Details of papers/patents: NIL

Brief description of working environment, expectations from the company: Working environment was encouraging and has good scope for learning new things.

Academic courses relevant to the project: Yes

PS-II Station:IBM India Software Group, Bangalore

Faculty

Name: Prof. Nishit Narang

Brief write-up on PS-II station : While our PS-II students are normally well equipped w.r.t technical skills and theoretical fundamentals, there is a need to be better equipped on some of the soft skills. In the Industry, projects are executed as a Team and not as an Individual. Hence, Teamwork is utmost important. This cannot be achieved without proper project management practices, including following all status reporting and communication practices and demonstrating a proactive approach. Many students lag on this aspect. Hence, a specific course on Project Management practices to educate PS-II students on the key practices and procedures are necessary, especially during the Work-From-Home (WFH) period.

Student

Name: IYER RAMYA VENKATASUBRAMANIAN(2019H1030026H)

Student write-up

Short summary of work done during PS-II: I worked on two projects in my PS with IBM security. The first one was to build an NLP based policy similarity checker. The work required building and developing the entire algorithm for working of the entire project from scratch. I worked on deep learning NLP based models for semantic similarity. The entire codebase was developed in python. The work also involved parsing and working on files of several formats(mainly CSV, XML, JSON).I also had to build a Django application demonstrating the work.I finished this project in 3 months and then there was one month of fine tuning the work.I was then assigned another project where I worked on permission analysis of android applications.

Tool used (Development tools - H/w, S/w): Python, deep learning, natural language processing, transfer learning, text analytics, django, numpy, pandas, matplotlib, seaborn, spaCY, tensorflow, keras, sklearn, Universal sentence encoder(USE), BERT, inferSent, Siamese networks.

Objectives of the project: Devices may be managed by multiple sources, these could apply policies to the same applications on the device. This may lead to conflicts between these policy sets leading to inconsistencies on the device. Applications on device can hence be managed by App restriction policies from different systems. When these get applied on the device and the settings, there can be conflicts and we can never predict the state of the settings on the device. We thus propose a similarity check system and associated methods to automatically co-relate attributes exposed in multiple management systems using machine learning and text analytics.

Major learning outcomes: Worked on several python tools and libraries. Learnt natural language processing.

Details of papers/patents: None

Brief description of working environment, expectations from the company: There will be regular meetings to discuss the progress. The project work is self paced with no strict deadlines. The mentors and managers are extremely helpful. Good work is highly appreciated by the team. Overall, the working environment is very peaceful.

Academic courses relevant to the project: Information retrieval, Machine learning, Deep learning.

Name: PRASANNA S(2019H1400079G)

Student write-up

Short summary of work done during PS-II: The main objective is to migrate the 32-bit Power PC based application firmware to build it for System Z 64-bit s390x architecture. The task involves understanding the existing OSA-ICC firmware design, various dependency components involved, build infrastructure for PowerPC, test methodology with hardware and then re-design/re-factor the build infrastructure to build OSA-ICC firmware for s390x environment, running it in Docker/ container environment, getting the performance benchmarking, developing the unit test framework and verifying the console connectivity.

Tool used (Development tools - H/w, S/w): IBM GUI interface to interact with the system and external devices, Github management, process flow through source code, Vim Editor, Support element, GitHub, SonarQube.

Objectives of the project: End to end migrating power PC 32-Bit OSA-ICC firmware to s390x architecture.

Major learning outcomes: 1. Next generation system z Networking IO domain knowledge2. System z Tn3270 console firmware design/architecture3. IBM's Power PC 32 bit arch, Linux device drivers4. IBM System z s390x internals and overview5. How to build the code as per the changes in architecture platform 6. Understanding D-Bus protocol and how to tweak the

functionality according to our needs 7. Dockers and Container cloud technology8. Source code management tool github9. Project collaboration technologies like Agile, Scrums etc

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The team was very interactive, helpful, approachable and always ready to clarify our doubts. As the internship was virtual, we didn't get much chance to have peer-to-peer interaction but still this didn't affect our day to day work. I had a periodic meetings with my mentor and manager to track my progress. The work was quite challenging as I was part of a live project where I had to interact and collaborate with different teams which helped me to learn the importance of team coordination and improve my adaptability to work in dynamic environment within a time limit to execute a given task. This internship developed my overall personality and gave me good insight on how things work in the corporate world thus making me understand on how and what to anticipate once I join as a full-time employee in any organization. I feel very fortunate to get such an opportunity and exposure from IBM and would try to apply all these learnings in my future endeavours. This internship developed my overall personality and gave me good insight on how things work in the corporate world thus making me understand on how and what to anticipate once I join as a full-time employee in any organization. I felt very fortunate to get such an opportunity and exposure from IBM and would try to apply all these learnings in my future endeavours.

Academic courses relevant to the project: Embedded Systems, Operating Systems, RTOS, Computer Networks, VLSI Architecture, Device Driver.

PS-II Station:IBM India Software Group, Pune

Faculty

Name: Prof. Chetana Anoop Gavankar G

Student

Name: LANKISETTI SAI VAMSEE KRISHNA(2019H1030015H)

Student write-up

Short summary of work done during PS-II: The project I was assigned is to develop Container Native Immutable Data Vault which is threat safe and allows Edge appliance to adhere to compliance and data sovereignty requirements.

- Enhance Spectrum Scale CSI to support immutable fileset with different modes including that of compliance mode.
- Design a special immutable data vault container offering hosted over immutable fileset via the CSI driver, with the ability to interface/communicate with other containers via NFS or REST API for data transfer.
- Modify the application filebrowser and integrate it to IBM spectrum scale where users can access their PV (Persistent Volume) using GUI where they can upload data ,access files etc
- Develop S3 browser tool for users to use in data vault application developed by me.

Tool used (Development tools - H/w, S/w): Github,Docker,Openshift,MERN Stack,Noobaa,VScode,Golang,Kubernetes.

Objectives of the project: Goal of the project is ability to have specialized data vault containers to host immutable storage.

Major learning outcomes: It was huge learning experience where I learnt about edge computing,openshfit,Kubernetes,docker,go Lang and lot of storage related concepts.Also built an application using MERN stack.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was WFH due to pandemic but the work culture is really good my mentor and manager are really encouraging and knowledgeable. Expectation from the IBM is willing to learn new things and able to apply them.

Academic courses relevant to the project: Network security, Computer networks, Computer architecture etc helped me to understand the concepts and learn new concepts faster.

PS-II Station:IMarc Services, Noida

Faculty

Name: Prof. Sandeep Kayastha

Student

Name: SHINDE JAY DATTATRAY(2016B2A10554G)

Student write-up

Short summary of work done during PS-II: The work comprised of carrying out secondary research through the internet concerning markets of different commodities and services. Upon researching this information about the different markets, their drivers, their compositions, categories, etc., can be compiled into report descriptions, press releases and backlinks. Further work involved working on data skeletons to quantify the results from the qualitative research.

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

Objectives of the project: Live projects for clients based on secondary research.

Major learning outcomes: I learnt about multiple industries of commodities and services, how they are categorised and driven by different factors. Furthermore, the learning outcomes included an understanding of what metrics potential investors look for and drawing conclusions based on raw primary data.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The mode of work was WFH, because of the pandemic, but the superiors expected regular timings and logged in on time everyday. The supervisors for interns were greatly helpful and often aided us if we were stuck. Deadlines were strictly followed and all the work is expected to be documented well.

Academic courses relevant to the project: Technical report writing; Principles of economics.

Name: KUNAL SULEKH(2016B4PS0619P)

Student write-up

Short summary of work done during PS-II: The work done at Imarc was an amalgamation of various tasks required at a market research company. While we were assigned daily targets in the form of RDs, PRs and Backlinks which are part of syndicated market reports, time and again there were client demands for custom market research reports. Further, market estimation, cost modelling, primary and secondary research, forming market sizing models on MS Excels were all part of this internship tenure.

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

Objectives of the project: Different projects had different objectives: The client demanded custom market reports had to have a detailed quantitative and qualitative analysis of the market well researched while ME sheets had to be a logical mathematical model of the entire market.

Major learning outcomes: Deep understanding of how primary and secondary research is conducted, how assumptions are taken and quantitative sizing of the market is done in market estimation, how to research and analyze drivers of a market and appreciation of how markets are interrelated and how policies affect markets. Further, management terms like PESTEL analysis and Porter's five forces are learnt.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment was friendly though initially due to WFH setup, getting used to it was a challenge. However as time passed and I did projects under various teams, I saw how helpful the seniors and people in this organization. We also had regular informal meetings to relax together and ease out the work-only environment that got induced by the WFH scenario.

Academic courses relevant to the project: Principles of Economics, Management, Statistics.

Name: SWADHIN SARAF(2016B5AB0706P)

Student write-up

Short summary of work done during PS-II: The work done at Imarc Services was majorly content writing and market research related work which was divided into two segments called primary and secondary research. For the first two months, all the tasks were related to content writing and secondary research for the website and occasionally, I wrote content for market reports. The next three months had more project related work as well as primary research for live projects. Secondary research consisted of going through available resources online and noting down the data points from confirmed and authentic sources, whereas primary research consisted of getting in touch with people directly involved in the market through mail or call and getting the data points from their knowledge and experience. Overall, there was more to learn by doing primary research when compared to secondary as I got an opportunity to talk to people who had skin in the game and thus felt more fulfilled with the resulting accuracy of the data. Initially, I had lot to learn from the content work as it helped improve my writing skills, but after a while the learning curve started levelling which automatically made me inclined to get involved with live projects.

Tool used (Development tools - H/w, S/w): None

Objectives of the project: Perform primary and secondary research.

Major learning outcomes: Improved research skills and communication skills.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment at Imarc Services was amazing. The team leaders as well as other employees always treated me with utmost respect and compassion and they were always there to help me out with any doubt I had. They were not just professional but also quite understanding when it came to the problems I faced in the tenure. The working hours were strictly followed, sometimes I had to extend that depending on the urgency of the work allotted to me. The company expected me to submit the work on time and in the form they asked me to do.

Academic courses relevant to the project: Supply Chain Management. Technical Writing.

Name: YASH GUPTA(2017A2PS1033P)

Student write-up

Short summary of work done during PS-II: I worked as market research intern for the company. During my tenure, I had been a key part of some very interesting projects, such as:

1. Market Research Report on 'MENA Region's Maintenance, Repair, and Overhaul (MRO) Market', a project that I submitted to DHL.
2. Market Estimation Report on 'Global Polpropylene Market'.
3. Cost modelling on several topics.
4. Content Development for the company's website.

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

Objectives of the project: I worked as market research intern for the company. During my tenure, I had been a key part of some very interesting projects like 1. Market Research Report

on 'MENA Region's Maintenance, Repair, and Overhaul (MRO) Market', a project that I submitted to DHL. 2. Market Estimation Report on 'Global Polpropylene Market'. 3. Cost Modelling on several topics. 4. Content Development for the company's website.

Major learning outcomes: 1. I got to delve deep into the ins & outs of market research 2. I got to work directly with some high-end clients on some very dynamic projects 3. I learnt the arts of market estimation & cost modelling 4. I was able to brush up my business writing skills to a greater extent 5. I was able to improve on my Microsoft Office prowess.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Great working environment. Working hours are respected a lot & the interns aren't overworked.

Academic courses relevant to the project: Technical Report Writing.

Name: KOTHAPALLY UJWAL GOUD(2017A3PS0319G)

Student write-up

Short summary of work done during PS-II: The initial work done pertained to SEO write ups such as report descriptions, press releases, backlinks, table of contents, data skeletons and FAQ and ARs. This involved mainly secondary research and overview of investor reports and case studies. We were then further included in official market research reports catered to the clients which constituted mainly of primary research i.e. contacting companies and business officials to obtain relevant data. Training modules were also conducted on topics such as market estimation, think-cell automation etc.

Tool used (Development tools - H/w, S/w): MS Office - Excel, PowerPoint, Word; Think-Cell, Search engines.

Objectives of the project: The major projects were syndicated reports which are required to cater to the client's needs. The objectives included an overview of the specific market, its segmentations, growth rate over the forecast period, trends and restrictions.

Major learning outcomes: Market research basics such as PESTEL analysis, Porter's five forces etc. along with primary and secondary research, market sizing and estimation, cost modelling, think-cell automation and creating catered market research reports and how trends and restrictions occur as well as forecast and historical period analysis.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The atmosphere at the company was very friendly and welcoming. The learning curve was gradual and integration of frequent training modules and the ease of contact with senior employees helped settle into the internship comfortably. The expectations were to understand the working of the company, the requirements of the client and how to cater to them whilst being punctual.

Academic courses relevant to the project: Principles of Economics, Principles of Management, Marketing Research, Probability and Statistics.

Name: RITIK RAJ(2017ABPS1159H)

Student write-up

Short summary of work done during PS-II: Writing content write-ups for market research website of Imarc Services. The work included writing report descriptions and press releases for different markets such as dairy milk, bandages, gaming consoles. The backlinks and FAQ, reviews were also similar in nature which had to be completed. Some basic secondary research was essential for writing the content parts for the market research reports and website. There was also market estimation training session where different approaches like top down and bottom up were explained. An individual project of market estimation sheet was also generated.

Tool used (Development tools - H/w, S/w): Microsoft Office (Power point, Word, Excel and Teams).

Objectives of the project: All projects were essentially market research.

Major learning outcomes: Domain skills and techniques such as SWOT analysis and Porter's five forces. Secondary research and primary research skills. Corporate work culture and team coordination.

Details of papers/patents: Not any

Brief description of working environment, expectations from the company: The expectations from work included getting familiar with actual market research work. The participation in reports started later (around a month or so) and the bulk of the work in the company actually constituted of writing write-ups. The people in company were quite helpful over all. The entire work was online in nature and thus done from home. This hampered the development of communication skills required in workplace. To make-up for the lack of offline participation, some team building events were held.

Academic courses relevant to the project: Strategic Management, Principles of Management, Technical Report Writing.

PS-II Station: Indian Institute of Remote Sensing (IIRS), Dehradun

Faculty

Name: Prof. Rekha Anandrao

Student

Name: RUDRABHATLA PRANAV RUDRABHATLA(2016AAPS0232H)

Student write-up

Short summary of work done during PS-II: I'm researching about the applications of IRNSS and GNSS satellites and their application based on the soil moisture detection and the weather conditions detection.

Tool used (Development tools - H/w, S/w): Used MATLAB and some tools given by the IIRS.

Objectives of the project: To separate the noise signals from the IRNSS satellite signals using soil reflectometry.

Major learning outcomes: Learnt about soil moisture, noise signals, real life Fourier transform application.

Details of papers/patents: None

Brief description of working environment, expectations from the company: It is really great. My mentor gave me motivation and many insights about the research. Over all, it was really fun working with them.

Academic courses relevant to the project: Digital Signal Processing and Communication Systems, Signals and Systems and EMFME.

PS-II Station: Indian School of Business (ISB), Hyderabad

Faculty

Name: Prof. Vamshidhar Ambatipudi

Student

Name: PASHAM GREESHMA(2017A2PS0990H)

Student write-up

Short summary of work done during PS-II: As part of a research study conducted by ISB, I had to collect data about startups and track their performance. The work involved interacting with entrepreneurs and asking questions related to their ideas and how they have executed the learnings taught in the research to develop their startups. The criteria involved testing them according to the scientific objective methods and personal subjective approach, while letting them evolve from an idea to a product/ service then to revenue stage, and simultaneously enhancing the data related to it.

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

Objectives of the project: The objective of the research is to provide a framework for aspiring entrepreneurs to develop their ideas into startups and monitor their execution and performance thereafter for atleast an year.

Major learning outcomes: My communication skills were greatly improved, as well as my MS-Excel skills. The experience helped me to become a better team player while collaborating with my peers, while also placing me in a managerial role as a team leader by supervising and guiding new learners.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Due to the pandemic, it was WFH. The project involved mainly using online resources, so it was comfortable working at home and the work load was flexible giving more time to develop other skills. My mentor at ISB guided me throughout the process and helped me learn new online

skills and also enhanced my communication skills. She also ventured into providing practical and anecdotal examples to help us understand better about the industry experience.

Academic courses relevant to the project: General knowledge of entrepreneurship, startups and social interaction skills was required. Any additional courses would be taught during the internship, if required.

PS-II Station:Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam

Faculty

Name: Prof. K. Suresh

Student

Name: DEORE ATHARVA GUNWANT(2017A3PS0290G)

Student write-up

Short summary of work done during PS-II: The aim of this project is to develop instrumentation circuitry for the Ion Beam Diagnostic System. This will aid the researchers at IGCAR to know the exact location (deflection, scattering, etc.) of the ion beam that they might require for their purposes. The project was divided into multiple stages and designed accordingly. The first part of the project was researching information about the Ion Beam System, HARP sensor, and other parts through literature survey. Then, simulations were carried out in different softwares to design the appropriate stage meeting the required specifications. The project encompasses various fields like analog electronics, digital VLSI design, embedded systems and computer programming.

Tool used (Development tools - H/w, S/w): Simulink, Proteus, LTspice.

Objectives of the project: The aim of this project is to develop instrumentation circuitry for the Ion Beam Diagnostic System.

Major learning outcomes: • Learntcore Electrical/ Electronic concepts.

- Analog & Digital Electronics, Embedded Systems, Computer Programming, Power Electronics
- Learnt to use various softwares.
- Soft skills development - Effective communication, Presentation skills, Group Discussion, Team work, etc.

Details of papers/patents: NA.

Brief description of working environment, expectations from the company: Mentors are very helpful.

Academic courses relevant to the project: Microprocessor Programming and Interfacing, Analog Electronics, Digital Design, Embedded Systems Design, Computer Programming.

Name: GHANTA SUHAS(2017A8PS0684G)

Student write-up

Short summary of work done during PS-II: To study the effects of resistive level sensor developed by the company.

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

Objectives of the project: To optimize the errors introduced by environmental factors in the sensor.

Major learning outcomes: The effect of temperature on the model.

Details of papers/patents: Deployment of quasi-digital sensor for high temperature
<https://ui.adsabs.harvard.edu/abs/2018RScl...89d5007S/abstract>

Brief description of working environment, expectations from the company: My project was entirely WFH, the company expected me to optimize any errors based on external effects.

Academic courses relevant to the project: Electrical Sciences, Digital Design, Analog Electronics.

PS-II Station:Indium Software, Chennai

Faculty

Name: Prof. Seetha Parameswaran

Student

Name: CHINMAY PRADEEP ROJINDAR(2019H1240132H)

Student write-up

Short summary of work done during PS-II: Implemented NLP projects on text summarization, question answering, named entity recognition, sentimental analysis. Learnt basic NLP concepts like text pre-processing to advanced NLP concepts like transformers, BERT, GPT and worked with real world data set. Worked with QA team to make the data also, had team meetings with clients and understood their demands and gave our solutions.

Tool used (Development tools - H/w, S/w): Python, Numpy, NLTK, Spacy, TensorFlow, Keras, PyTorch, Ktrain, Jupyter notebook, Google Colab, Kaggle kernels.

Objectives of the project: To work with the analytics team and learnt about client demands, work on those projects, the projects should be accurate and according to the market standards.

Major learning outcomes: Understanding of various basic and advanced concepts NLP, concepts text, pre-processing, tokenization, stemming, lemmatization, Word2vec, understanding of various architecture RNN, LSTM, bidirectional LSTM, Seq2seq model, attention models. Various other transformer based models have been understood and use cases based on above technologies has been implemented. Implemented project on Text summarization, QA, semantic analysis, name entity recognition based spam detection. Understood various other aspects of working in the organization, Interpersonal skills improved and learnt a lot.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was WFH but didn't cause any lack of interaction with co-workers. Everyone was very friendly, supportive, we could ask any doubt if got stuck, the company expect us to learn basic to advanced concepts and implement the project assigned in given timeline, theoretical concepts are expected to learn as fast as possible.

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

PS-II Station:Infinera, Bangalore

Faculty

Name: Prof. Satya Sudhakar Yedlapalli

Student

Name: MADHAV SASIKUMAR(2016B5A70479G)

Student write-up

Short summary of work done during PS-II: Making a dash Python based web application that compiles data from the network nodes and help the staff in deciding if a node is ready to be migrated from C-Band to L-Band.

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

Objectives of the project: Make an application that helps in migrating network from C-Band to L-Band.

Major learning outcomes: Application design

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is good, and the company instructor is very helpful, the amount of work gives is appropriate and never makes you feel pressurised. A good balance between work and learning.

Academic courses relevant to the project: CP

PS-II Station:InMobi- Business Analyst, Bangalore

Faculty

Name: Prof. Ramesh Venkatraman

Brief write-up on PS-II station: Following are the common expectations from the students across the PS Stations:-

- (a) Self-starter, Taking initiative
- (b) Be prompt, Responsive
- (c) Open to learn, Quick to learn
- (d) Ability to communicate effectively - Oral & Written

In InMobi, we had 5 interns during this PS-II. They were mostly working on Digital Marketing. When some of the Mentor(s) themselves were away from work due to Covid, our students stepped in to take their responsibilities too and delivered them well. This has helped InMobi to handle the activities smoothly during the pandemic times. This has created a positive image about the interns from BITS-Pilani. With a result, InMobi has requested for 45 interns for the next semester.

Student

Name: ANANT KUMAR TRIPATHI(2016B2A30903P)

Student write-up

Short summary of work done during PS-II: InMobi is a part of the Ad-Tech industry. The work involved handling different campaigns across different advertising channel like iDSP, IAP, etc. Optimizing campaigns to give better ROI, ROAS and performance. Analyzing different data and simulation based on different scenarios given by the clients. Daily tasks involved monitoring data, analyzing performance, optimizing campaigns, performing simulations, analyzing audience segment, research, etc.

Tool used (Development tools - H/w, S/w): DSPs (Demand Side Platforms), SSPs (Supply Side Platforms), MS Office, Salesforce, JIRA, Clarity Platform, MMPs, Python (depends on project and team), Different Ad-tech data collecting software.

Objectives of the project: The main Objective of the Project was to help the team in improving the campaign performance and managing the accounts.

Major learning outcomes: 1) Insight about the Ad-Tech industry2) Data analysis skill3) MS Excel/ MS Office4) Learnt about different tools that are being used in Ad-Tech industry.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The PS-2 was WFH. The work environment and work culture was amazing. People were very helpful and supportive. One can get additional project/tasks depending upon interests. Being part of the Japan and Korea, helped me in learning about their work culture.

Academic courses relevant to the project: Cross Cultural Skill.

PS-II Station: Insights Alpha, Delhi

Faculty

Name: Prof. Sandeep Kayastha

Student

Name: UTKARSH SHARMA(2017A2PS0851P)

Student write-up

Short summary of work done during PS-II: The work involved helping the team to find leads and work on bio making for experts for various global projects. It has daily target which needs to be fulfilled and the work remains same. You can ask for market research projects with the head

of the team and there are many chill and fun sessions also where you can participate. The team is very helpful and fun to work with them.

Tool used (Development tools - H/w, S/w): Naukri resdex, word, LinkedIn sales navigator, Outlook.

Objectives of the project: Making Bios and Lead generation with market research involved often.

Major learning outcomes: Corporate knowledge, industry needs and problems related to every facet of every sector.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: WFH due to pandemic. Fairly easy work, easily approachable staff, proper trainings will be given for every software and work.

Academic courses relevant to the project: Technical report writing.

Name: SRI SHIKHA RAO KASUBAGA(2017A5PS1178H)

Student write-up

Short summary of work done during PS-II: I have joined Insight Alpha as a management trainee. At the start of PS, I was given orientation about the work that is supposed to be done that is mainly making a bio and lead generation.

Tool used (Development tools - H/w, S/w): LinkedIn, Naukri.com.

Objectives of the project: Lead generation and Bio making.

Major learning outcomes: Proper use of Linkedin and Naukri and to carry on Lead generation.

Details of papers/patents: None

Brief description of working environment, expectations from the company: All the things are micro-managed. I was supposed to ask for projects everyday and had to report the sign in and signout times.

Academic courses relevant to the project: Technical report writing.

PS-II Station:Instrumentation solution, Gurgaon

Faculty

Name: Prof. Mahesh K. Hamirwasia

Student

Name: SHIVA SRIVASTAVA(2019H1300137H)

Student write-up

Short summary of work done during PS-II: The work mainly comprises of learning of instrumentation related to pavement engineering and the practical concepts related to them.

Tool used (Development tools - H/w, S/w): Falling weight deflectometer, network survey vehicle, pavement quite indicator, etc.

Objectives of the project: To understand the concepts and practical aspects related to pavement engineering instruments.

Major learning outcomes: The practical knowledge of field use of instruments.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment in company is very supportive and friendly. Everyone in company supported me throughout the PS duration.

Academic courses relevant to the project: Pavement analysis and design, highways construction and practices, pavement material characteristics.

PS-II Station:Intel India Technology, Bangalore

Faculty

Name: Prof. Swapna S Kulkarni

Student

Name: HONNESH ROHMETRA(2016B2A70770P)

Student write-up

Short summary of work done during PS-II:

- Did a literature survey for style transfer and temporal consistency models using optical flow and other techniques.
- Worked on the performance aspect of the architectures with different optimizations.
- Paper based on work done during PS-2 was accepted in the largest internal conference in Intel.

- Worked on networks which help to augment the graphics pipeline by including a learnable component.

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

Objectives of the project: The style transfer project aims for an alternate architecture for real-time temporally consistent video style transfer. On the neural rendering side, this project aims for explicit or implicit control of scene properties such as illumination, camera parameters, pose, geometry, appearance, and semantic structure.

Major learning outcomes: Worked on AI projects, end-to-end, right from research to deployment.

Details of papers/patents: Filed a provisional patent. Paper based on work done during PS-2 was accepted in the largest internal conference in Intel.

Brief description of working environment, expectations from the company: Great working environment.

Academic courses relevant to the project: Neural Networks, Image Processing, Data Mining, Computer Graphics.

Name: KARAMCHETI SRI KRISHNA MANOJ(2019H1030020P)

Student write-up

Short summary of work done during PS-II: The main objective of this project is to develop a data extraction module, which would extract data from SQL based DB (Oracle DB) and migrate it to a NoSQL based DB (MongoDB). The extraction of data would involve collecting the data, processing the data to check whether it is ready or not (several conditions need to be checked), maintaining separate code for retry checks, pushing the data into queues for migration. Thus,

these tasks are to be developed as modules of the project. This project would streamline most of the activities that must be performed in order to migrate data from one DB to another.

Tool used (Development tools - H/w, S/w): PL/SQL Developer, Oracle SQL Developer, Visual Studio.

Objectives of the project: To develop a data extraction module, which would extract data and help in migration to MongoDB.

Major learning outcomes: Semiconductor chip manufacturing process at Intel, Agile development, DB migration.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is very positive. Peers, mentor and manager were very helpful in the onboarding process and helped me whenever I had questions. My mentor helped me understand the overall flow of the project and cleared my doubts as and when I had. Although, the work was entirely in online mode, the team never let that become a barrier.

Academic courses relevant to the project: DBMS, Software Engineering & Management, OOAD, Software Testing Methodologies.

Name: ASWIN B(2019H1030022P)

Student write-up

Short summary of work done during PS-II: The 1st project involved retrieval of logs from multiple remote machines, cleaned and processed them to make them suitable for file beat config generation. Using this config file, the logs can be pushed into the elastic stack engine for text based search and custom visualizations at ease.

The 2nd project involved connecting the local environment to the Azure DevOps server. From there the version control data and the workitem fields were retrieved. Necessary validations were carried out and the errors and issues were reported into a HTML based report. This is then sent as a scheduled automated mail from outlook to the stakeholders.

Tool used (Development tools - H/w, S/w): Elastic search, Python, C++, Git, Azure DevOps.

Objectives of the project: To retrieve the application logs from text files and make them suitable for visualization in Elastic search stack. To automate the validation of Azure DevOps entry fields and create HTML based report to represent them.

Major learning outcomes: Learnt about production level code design, operating systems, understood about elastic stack engine and python based automation.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: As far as I have experienced till now, Intel is an employee friendly and ethical company. They are not flashy like other product companies and they use their resources wisely. My department is a technologically sound department that dealt with pure CS related stuff like operating systems and low level C++ coding. Had opportunity to work with a product architect. This is a company that is designed for people who likes to be here for long run. Work life balance so far is pretty good. People interested in a particular domain cannot ask for placement in that department. They have to spend some time in allotted department before they can apply for internal transfers to respective departments.

Academic courses relevant to the project: Operating systems, software engineering and management.

Name: SUBHASHIS DHAR(2019H1030023P)

Student write-up

Short summary of work done during PS-II: The main objective of the project is to convert existing tool to suit our team needs. This regression testing tool attempts to predict code output without deployment to any environment and enables to test the system against pre-defined production scenarios. It also enables easier debugging by automatically locating point of exceptions or reproducing production bugs.

Tool used (Development tools - H/w, S/w): SW- C#, WPF,WCF, EKL, Visual Studio 2019,Kibana,Logstash,Internal tools.

Objectives of the project: The main objective of the project is to convert existing tool to suit our team needs. This regression testing tool attempts to predict code output without deployment to any environment and enables to test the system against pre-defined production scenarios. It also enables easier debugging by automatically locating point of exceptions or reproducing production bugs.

Major learning outcomes: Learning objectives from this exercise includes software engineering, agile development and attending daily scrum meetings. This gives immense exposure to how industry handles the whole software development process; importance of rigorous testing regimes and handling change management efficiently.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: The team was very helpful in terms of giving opportunities to ramp up at own pace and mentor provided support at each step. Work culture and work life balance is praise worthy but it also depends on individual teams and the work they do. Interns are assigned to common pool of candidates and interviewed for PPO. So the FTE offer may not be from the same internship team.

Academic courses relevant to the project: Software Engg and Management, Cloud computing, SES.

Name: SHASHANK S(2019H1120054P)

Student write-up

Short summary of work done during PS-II: I was involved in the development of features that monitored system resources used by the server applications. These applications are business critical and any downtime can have severe impact. These services alerted the stakeholders, when a particular system resource usage was beyond certain threshold. Some of these features included monitoring MSMQ, process, windows event log etc.

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

Objectives of the project: The main objective of this project is to enhance the high availability of the product application by adding system resource monitoring features, that alert the stakeholder to necessary action before the system crash.

Major learning outcomes: Understanding of high availability, monitoring services, message queues (MSMQ), windows event logs, C#, agile methodologies.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work environment is quite good at Intel. Team members are supportive and helpful. There was regular meet up with the mentor. Work culture encourages learning.

Academic courses relevant to the project: Operating systems, Cloud computing, Object Oriented analysis and design.

Name: PRIYAM UPADHYAY(2019H1230082P)

Student write-up

Short summary of work done during PS-II: Worked on structural design of server SoC. Complete flow from synthesis, placement, and routing. Mainly my work was focused on logic equivalence checking of SoC after each stage of design as well as low power design intent of SoC. Also worked on parasitic extraction and timing fixes for various partitions of design. Apart from the regular work mentioned above, I had to do some scripting work as required for post processing for various signoff checks.

Tool used (Development tools - H/w, S/w): Design related tools: Synopsys Design Compiler, IC Compiler, VC-Low Power, Primetime, Cadence Conformal.
Scripting: Perl, Python, TCL, shell scripting.
OS: Unix

Objectives of the project: Backend design and verification of SoC design.

Major learning outcomes: VLSI backend design.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Internship was completely WFH, the environment in such scenario is vastly different from the on-campus experience. Intel has adapted to WFH model and organizes various activities to keep their employees engaged and connected. Managers, mentors, and all team members are very approachable and ready to help with smallest of the problems.

Academic courses relevant to the project: VLSI design, VLSI test and testability.

Name: UPENDRA YADAV(2019H1230543P)

Student write-up

Short summary of work done during PS-II: For cases of timing exceptions such as multi-cycle and false path, RTO modules are to be introduced for their validation. The timing exceptions are written in SDC file from which parameters are to be fetched using an automated script and suitable changes are to be done in corresponding system verilog files. A perl script has been written to fetch the parameters depending upon the kind of timing exception.

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

Objectives of the project: Validation of manual MCOs.

Major learning outcomes: Timing exceptions, Module instantiation, Scripting in Perl.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment required cloning the RTL model from remote repository and modifying it to our use for validation purpose. Verdi tool was used to get details of designs and parameters. Perl was used for scripting purpose. Looking forward to work full time in the company.

Academic courses relevant to the project: Some concepts of system verilog were used.

Name: SILPA SATHYAN(2019H1400072G)

Student write-up

Short summary of work done during PS-II: There were host script and target script developed as part of the project. I was able to add certain features to the scripts as part of work. Also, verified the features by running test cases from automation script. Features added include 1. OS info capture in target script 2. Control groups in target script 3. Priority wise run of test cases in host script 4. Integrate host script and target script.

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

Objectives of the project: Since number of platforms have increased significantly along with increased infrastructure needs, there is need to initiate same configuration, feature enabling, and validation test cases across multiple platforms/systems. Also, there had misses with different customers on the combination of BIOS knobs that led to different system behaviors and failures. With human intervention, setting up huge list of BIOS knobs and its combination is time consuming and error prone. Aim is to make same configuration setup applied across multiple systems at the same time thus reducing manual intervention in day-to-day execution and ensure no feature and combination is left out. Automation and scaling of test together helps in round-the-clock stressing of the platforms to know how good the server performs, and in-turn simulate the real-world scenarios. This helps in utilizing 100% bandwidth of the platforms and stressing them to the core. It would help us validate across different components like CPU, Memory, PCIe, Power and Performance, PCH, x-product flow verification and different BIOS configurations.

Major learning outcomes: Python scripting, Automation of test cases on servers.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Very friendly managers and mentors. Company expects us to be part of a project and give our best input. Interns are guided very well by the mentor and others in the team.

Academic courses relevant to the project: Python, Operating system, Computer architecture.

Name: YAKKATI RAJESH REDDY(2019H1400553H)

Student write-up

Short summary of work done during PS-II: I'm a part of platform validation team where we used to validate the functionality of dynamic load balancing accelerator which is a part of Intel's server processor under various scenarios and to evaluate the performance of the accelerator. Various test cases of different scenarios are created and executed to validate the functionality of dynamic load balancing accelerator which is a part of Intel's server processor. The performance of the accelerator is also evaluated using some Intel's internal applications. Learnt about the architecture of sever processors and its features, various operating systems. Learnt about Intel's accelerators like dynamic load balancer, quick assist technology, etc.

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

Objectives of the project: To validate the functionality of dynamic load balancing accelerator which is a part of Intel's server processor under various scenarios and to evaluate the performance of the accelerator.

Major learning outcomes: Linux Operating Systems, Processor architecture, Server systems.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It's the best company where one can start a career and has many opportunities to learn new things. The working environment is too good. The team members are very humble and always ready to help. Every Employee will be rewarded for their work.

Academic courses relevant to the project: Linux Device Drivers, Linux Operating Systems, Computer architecture, Embedded systems.

PS-II Station:Intercontinental Consultants and Technocrats Pvt. Ltd., New Delhi

Faculty

Name: Prof. Mahesh Kumar Hamirwasia

Student

Name: SNIGDHA SRIVASTAVA(2019H1440112P)

Student write-up

Short summary of work done during PS-II: From feasibility studies to planning, design, procurement, construction supervision, and post-construction assessments, MX road software tool was adopted for designing of the four-lane road from Sambalpur to Ludeg (in the state of Orissa) with assistance from Indian Road Congress codes. In the traffic department, learnt about traffic count, ADT, AADT, Axle load analysis, traffic projection, four step modeling process is being developed with the help of zoning and Link-nodes development using GIS tools. Flexible and semi rigid pavement design was studied thoroughly. The variation in the stress/strain behaviour of layers, when designed under varying CBR conditions, varying traffic and with different types of layers were studied along with a go through over the company's built in excel sheets used for the calculations. Concluded the pavement division with a brief study about FWD, both on flexible and rigid pavement. Learnt in detail the factors contributing to the rate of work, the cost involved in any work including transportation, labour, machinery, materials. Detailed quantity of material calculated and hence cost abstract was prepared.

Tool used (Development tools - H/w, S/w): MX Roads, Arc GIS, QGIS, IITPAVE, MS Excel.

Objectives of the project: To understand the various design standards and codes used for project. To get exposure to the real time project implementation. Enhance the knowledge about various reports prepared before execution of project. Improve relevant skills and get a closer picture of professional life.

Major learning outcomes: Highway designing using MX roads, Transportation Modeling using GIS tools, Pavement Design using IITPAVE, Quantity Survey and Contracts using MS Excel.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Highway department deals with geometric design of highways, and pavement division takes care of selection of pavement type and its design. Traffic and transportation division was more in planning, research and experiments as we got real exposure to live scenarios. Quantity estimation dealt with cost and estimation.

Academic courses relevant to the project: Transportation System Planning and Management, Principles of Geographical Information Systems.

PS-II Station: IQVIA, Bangalore

Faculty

Name: Prof. R. Bharathi

Student

Name: MEGHNA PANDEY(2019H1080533P)

Student write-up

Short summary of work done during PS-II: I was assigned to the charting and reporting hub that deals with the syndicated offering of the IQVIA and my work involves: Creating client deliverable and updating recent months data by formatting the deliverables and ensuring consistency in the whole deliverable. Also, I have been assigned on the project regarding the competitive analysis to carry out the secondary research and collecting data of the competitor's companies.

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

Objectives of the project: 1. To study the primary market research offerings by the competitors company 2. To study the new emerging methodologies in the primary market research 3. To understand the client needs in the primary market research.

Major learning outcomes: I learnt about market research that how it is conducted, how the data collected and presented to the clients. Also, how to conduct a secondary research and the collection of the data from the trustful sources.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: The work culture of IQVIA is really very good. Due to COVID-19 crisis, whole internship was WFH but the whole primary intelligence team is very supportive and taught me several things related to market research. Also they give you opportunity to work on multiple projects on same time so that you can learn many things in that short span of time.

Academic courses relevant to the project: Pharmaceutical Administration and Management, Biostatics.

Name: KADAKIA HARITA JIGNESH(2019H1080535P)

Student write-up

Short summary of work done during PS-II: Learnt and contributed in primary research and secondary research. Worked in primary research delivery. Thankfully, got a chance to learn how to navigate the working world through real-life, hands-on experience.

Tool used (Development tools - H/w, S/w): Excel, Power Point, R programming.

Objectives of the project: To provide insights and a competitive edge to IQVIA against the competitors by compiling the data gathered through extensive secondary research.

Major learning outcomes: Learnt regarding how primary research is carried out.

Learned about ways to gather competitive intelligence.

Understanding primary market research in Healthcare for U.S. market.

Collaborative and communication skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Positive working environment which was supportive as well as collaborative.

Academic courses relevant to the project: Biostatistics, Pharmaceutical Administration and Management, Intellectual Property Rights.

PS-II Station:IQVIA, Cochin

Faculty

Name: Prof. R. Bharathi

Student

Name: ABHINAV SWARAJ(2017A3PS0589H)

Student write-up

Short summary of work done during PS-II: The project aims to analyse prescription level data of patients to calculate some KeyPerformance Indicators (KPIs), that can help drive patient engagement, diagnosis, retentionand disease management pathways. The KPI that we intend to calculate in this project is Persistence Index, which is a measure of the adherence of patients

to a particular line of therapy. We were also tasked to develop a Post COVID App to provide tele consultancy to COVID long haulers.

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

Objectives of the project: The project aims to analyse prescription level data of patients to calculate some Key Performance Indicators (KPIs), that can help drive patient engagement, diagnosis, retention and disease management pathways.

Major learning outcomes: This interpretation of granular patient data, when presented to the doctors through a Healthcare UXplatform or application, can help them plan timely interventions for vulnerable patientpopulations. The Post Covid App can potentially be developed into an IQVIA product for COVID long haulers.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment was supportive, innovative and collaborative.

Academic courses relevant to the project: OOP, OS, Cryptography.

PS-II Station:IQVIA, Gurgaon

Faculty

Name: Prof. R. Bharathi

Student

Name: MEHAK RASTOGI(2019H1080536P)

Student write-up

Short summary of work done during PS-II: My contribution was directed towards the IQVIA's integral tool team for database maintenance by performing secondary research for tracking new approvals and indications for existing clients and bringing business from the new clients. Worked on some reports using secondary research regarding acquisitions/ mergers of difference pharmaceutical companies. Worked on a project centered around Primary Market Research (PMR) in U.S. Healthcare market by performing secondary research regarding PMR offerings of IQVIA and its competitors in that domain. Taken an initiative as well for actively contributing to the preparation of a Newsletter for the organization regarding the major events in the pharmaceutical industry related to new approvals, mergers and new acquisitions, COVID-19 etc. Worked on preparing company profiling sessions of the major pharmaceutical clients of IQVIA to be included in the Newsletter initiative. Hosted Quiz sessions regarding the new U.S. FDA approvals along with some Pharmacy-centric questions.

Tool used (Development tools - H/w, S/w): MS Office tools (MS Excel, MS Word, MS PowerPoint), IQVIA's integral tool for database maintenance.

Objectives of the project: To understand the current scenario of PMR in the current U.S. Healthcare market.

Major learning outcomes: The importance of secondary research and database maintenance for maintaining data integrity. Working with MS Office tools – MS Word, MS Excel, and MS PowerPoint.

Details of papers/patents: No such outcome from secondary research.

Brief description of working environment, expectations from the company: At IQVIA, the working environment that existed between the team members and within the organization even it was WFH was very encouraging and motivating. Occurrence of pandemic did not affect the efficiency of the team at all and proper care and incentives were given to the team members suffering from COVID-19 crisis. The team members were very good in communicating their ideas and expectations regarding the completion of different projects and tasks. Also, the team members were patient enough to rectify the mistakes and used to explain everything regarding

the shortcomings on our part. Everyone used to give constructive criticism and was actively involved in the tasks and activities organized for maintaining mental and physical health.

Academic courses relevant to the project: Pharmaceutical Administration and Management.

PS-II Station:John F Welch Technology Center (GE), Bangalore

Faculty

Name: Prof. Shashank Mohan Tiwari

Student

Name: SIDHARTH MAHESH(2019H1060510H)

Student write-up

Short summary of work done during PS-II: To estimate the damage due to wind loads, the method of random vibrations was used with the Dirlitk method as a cycle counting technique in the frequency domain. All the approaches were implemented in ANSYS APDL, and an entire macro was developed to automate the process from developing the geometry based on GE tower data, meshing, boundary conditions, solving, post-processing, and estimating damage by the Dirlitk method. Also, I had exposure to develop an excel based tool that was designed to optimize hub height based on value analysis. A model was developed which would optimize the hub height based on loads and developed costing model.

Tool used (Development tools - H/w, S/w): ANSYS APDL, EXCEL VBA, MATLAB.

Objectives of the project: To use the method of random vibrations to determine the failure of wind turbine tower inner components. Instead of time-domain analysis, a frequency-driven

assessment was done to estimate damage due to wind-induced loads on the tower structure with the help of random vibrations keeping the Dirlik method as background. My second project's objective was to develop an excel based tool that can optimize the wind turbine tower height based on annual energy consumption. Instead of looking onto loads, along with it, a costing model (value analysis) was also developed to improve the profit rate over years.

Major learning outcomes: An insight on fatigue assessment in frequency domain, dynamic analysis of wind turbine structures, wind turbine mechanical load analysis, development of costing model for a project.

Details of papers/patents: No

Brief description of working environment, expectations from the company: I was extremely impressed by the work culture that GE possess. They are completely cooperative and are easily approachable. Even if one doesn't know an answer, they will point us in the right direction to whom we might get a solution. The company expects us to be a good listener and a good contributor not one who works by orders. Someone which can contribute to their projects as well. They consider interns also as regular employees, which also tells why they are so good.

Academic courses relevant to the project: Finite element methods, Dynamics of vibration, Strength of materials, Machine design and structural analysis.

Name: RAJAT KUMAR MAURYA(2019H1410553G)

Student write-up

Short summary of work done during PS-II: Worked on one of the very important topic in current situation - decarbonization. It involved to study and analyze various technological advancements and understand its application in power producing industries.

Tool used (Development tools - H/w, S/w): Word, PPT, Presentations, Internet.

Objectives of the project: To prepare a report on decarbonization.

Major learning outcomes: Learnt a lot on current technologies and work which is being done towards decarbonization. This also helped me to understand the trends which we may see in coming times in power producing sector.

Details of papers/patents: No papers/patents intended.

Brief description of working environment, expectations from the company: Great working environment. Enjoyed working with the team. The kind of mentorship we received from seniors is very good and motivational. They expect us to develop an understanding of allotted work and learn while exploring the same. They guided us continuously to ensure that we are understanding and leaning from the work we are doing.

Academic courses relevant to the project: Finite element methods, Strength of materials.

Name: PAMIDI GOPI KRISHNA(2019H1410566H)

Student write-up

Short summary of work done during PS-II: My work was mainly focused on both lube-oil system and seal oil system of 7HA.03 and 7HA.02 GE Gas turbines. Lube-oil system is used to lubricate the bearings whereas seal oil system is used to seal the hydrogen gas that is used for generator cooling purpose. Worked on modelling (1-D Model) and simulation of these systems. The tool used was GE Flow simulator for completing these tasks. As a part of my work, I also validated different pumps that were used in these systems. The main purpose of doing these project is to provide my team a ready-made model, which they can use easily without spending much time on modelling. Resizing of orifices was also done to ensure that there is enough flow through the by-pass orifice of pressure regulator valve section. Finally, tuned these systems so that we get the required flow at the gas turbine bearings and generator bearings.

Tool used (Development tools - H/w, S/w): GE flow simulator, Navisworks manage, NX viewer.

Objectives of the project: The objective was to simulate and tune the system such that we get the required flow at the bearings.

Major learning outcomes: Learnt how to model real time flow in flow simulator and how to validate the pumps as per the pump characteristic curves.

Details of papers/patents: NIL

Brief description of working environment, expectations from the company: Although because of pandemic, we worked from home, really had great time interning in GE. All my mentors supported and encouraged me in completing the tasks. Mentors were friendly and patient enough throughout my internship.

Academic courses relevant to the project: Fluid mechanics, Finite element analysis, Hydraulic machines.

Name: DIVY DESH SRIVASTAVA(2019H1410585P)

Student write-up

Short summary of work done during PS-II: Being a part of Hot Gas Path(HGP) team in GE Gas Power, multiple projects were assigned that were related to HGP components in a gas turbine. The 1st project was to assess and analyze the impacts of using 100% hydrogen as a fuel on HGP components. This involved a lot of literature study and extrapolating from the available data to assess the impact on different parameters. The 2nd project was to landscape the Damping IP in gas turbines which involved literature study and analyzing patents filed by competitors to determine all the recent developments in damping turbine blades, particularly the 1st stage blades. Various damping methods like internal and external friction dampers, use of

VEMs and damping coatings were studied and summarized to determine the most feasible near future solutions for improved damping. The 3rd and the ongoing project is to explore ANSYS Predictive Maintenance Tool and ANSYS Design Optimization, which involves exploring ANSYS Digital Twin Software and determining inputs required for predicting the life cycle of 1st stage turbine blades, developing a simulated model and predicting desired outputs by providing real time inputs from an active onsite asset.

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

Objectives of the project: 1) Impact of using 100% Hydrogen as a fuel on HGP components in a gas turbine 2) Damping IP landscape in gas turbines 3) Exploring ANSYS design Optimization and Predictive Maintenance tool.

Major learning outcomes: 1) Fundamentals of working of a Gas Power Plant2) Gas turbines working, different types and its components3) Technologies currently being used and planned for the future of a gas turbine, particularly in use of hydrogen as a fuel4) Damping mechanisms in a turbine blade5) Concept of predictive maintenance required for a gas turbine.

Details of papers/patents: No paper/patent intended for publishing.

Brief description of working environment, expectations from the company: The culture and people of GE is what sets it apart from other companies. The work environment was very friendly and motivating enough to enjoy your work and push your limits. I was really amazed to interact with the talented people, highly experienced in their respective fields and yet so easy to approach and talk to. The environment encourages you to indulge in enormous learning opportunities and fields provided by GE that you'll never go out of. The EEDP program offered by GE has been tailor made for HD students that offers ample time to learn and experience different technologies through their 4 rotations in different teams. The program offers everything that I expect and surely will satisfy any student's expectations.

Academic courses relevant to the project: Academic courses such as Finite Element Method, CFD, Vibrations, Materials Technology and Testing and basic mechanical subjects from my B.E. played a huge role in completing my projects and understanding the concepts relevant to it.

PS-II Station:John F Welch Technology Center (GE), Hyderabad

Faculty

Name: Prof. Samata Mujumdar

Student

Name: KARTIKE SINGH GAUR(2019H1400100G)

Student write-up

Short summary of work done during PS-II: By involving in this project, I have been able to gain insights about the generic controller and QNX software development platform. Due to migration from 32-bit to 64-bit architecture, a lot of compilation errors have been surfacing therefore, a lot of software needs to be done. I have also been able to gain insights about the power plant controller and the different processes which run in it. Since, each process must interact with other processes, therefore I gained valuable knowledge on how each process is designed and what are the design considerations which need to be considered while writing a one.

Tool used (Development tools - H/w, S/w): QNX Momentics IDE, WinSCP.

Objectives of the project: This project aims to migrate the Power Plant Controller to a new x86 hardware along with upgrading 64-bit QNX RTOS7.1. Currently the controller runs a 32 bit RTOS and the AMD processor which is used is going to be obsolete. Hence, this project aims to upgrade to x86 hardware with new operating system. The QNX 7.1 comes with more built in security features. Since, this is the first version of 64 bit controller, a lot of system level

performance testing needs to be done, to make sure that the system operates well within the time frame boundaries 10 to 320ms.

Major learning outcomes: Power plant controllers, QNX RTOS, Software testing.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is very peaceful, everyone is willing to assist you. Each and every employee has a fair knowledge of stuff he is working upon. The opportunities are very bright. Expectations include improved inclusion of technologies such as AI/ML as these are being most sought technical skills.

Academic courses relevant to the project: Embedded System Design, Software for Embedded Systems.

PS-II Station: Johnson Controls, Pune

Faculty

Name: Prof. Samata Mujumdar

Student

Name: MUDIT SINGHAL(2019H1060517H)

Student write-up

Short summary of work done during PS-II: Three projects was assinged to me. The first project was on measurement and analysis of vibration on RTU during truck transportation. The

objective of this project was to get the vibration characteristics in trucks as function of speed, payload, suspension type, road type/condition. Generally, three types of vibration occur on goods while transportation (i.e.) lateral, longitudinal, vertical vibration. At lower frequency vertical vibration are significant as compared to lateral & longitudinal but at higher frequency all three of them are equidistant. For better study random vibration were considered.

The second project was to develop an Excel Macro Code for determination of critical speed of shaft with multiple rotors and supports, considering all forces and moments accounting it. The critical speed of three rotor system are analysed with two boundary conditions (i.e.) two support and three support. The critical speed analysis is carried on solid shaft made of structural steel having density of 7850 kg/m³. The Excel code is designed in such a way that it can calculate critical speed for multiple range of inputs. It is observed that, the critical speeds are altered by changing boundary conditions. The third project aims to develop a generalized approach in selecting lugs locations of RTU so that the forces and stress at lugs are equidistant and minimal.

Tool used (Development tools - H/w, S/w): ANSYS, MATLAB, EXCEL VBA, MINITAB.

Objectives of the project: 1) Measurement and analysis of vibration on RTU during transportation 2) Determination of critical speed of shaft using excel macro 3) Creating generalized algorithm for RTU lifting lug location.

Major learning outcomes: Fast Fourier transform, Power Spectral density, DOE analysis, Excel VBA modules.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Johnson controls is one of the best place to work as mechanical engineer. The managers are quite supportive and always ready to help. At JCI your ideas, suggestion, work etc. is appreciated at each and every level.

Academic courses relevant to the project: FEM, SOM, Mechanical Vibration, Advance Engineering Mathematics.

PS-II Station:JPMC Corporate Analyst Development Program, Bangalore

Faculty

Name: Prof. Siddarth Mishra

Student

Name: ANURAG KUMAR(2016B1AA0606G)

Student write-up

Short summary of work done during PS-II: Work revolved around regulatory reporting and analytics involving those reported trades. Also used tools such as Alteryx and Tableau to make the process more efficient.

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

Objectives of the project: To reduce manual work time by automating regulatory reporting processes. Ensuring due diligence and compliance for trade reports.

Major learning outcomes: Got better understanding of the financial sector and trade regulators as well as the trade lifecycle.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Excellent working environment. Teammates were very supportive and always helped us with any doubts. My team at JP Morgan had an excellent work culture. There are plenty of opportunities available for interns at JPMC but it is essential that one explores and reaches out for them. There are also high chances of getting a full time job offer in the CADP program.

Academic courses relevant to the project: FuFA

PS-II Station:JPMS CIB R&A Banking (CRG) – Fin-Tech, Mumbai

Faculty

Name: Prof. Saikishor Jangiti

Student

Name: SHIKHAR SAHU(2016B1A80632G)

Student write-up

Short summary of work done during PS-II: The role was centered around CRG's automation initiative. Along with deploying Python libraries and creating VBA macros, we were expected to understand business challenges affecting the department, and work with off-shore and on-shore teams to arrive at solutions. The task usually started with automating time-consuming manual tasks, however most projects evolved far beyond their original scope in terms of time saved, functionality and target users. During my time, I worked on mostly front-end coding VBA macros for Excel/Powerpoint and Python functionalities were required in a few projects as well.

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

Objectives of the project: Process automation

Major learning outcomes: Python / VBA / MS office skills, Financial modelling, Communication skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The CRG office serves as a middle office to investment and corporate banking operations around the world. There is a first-name culture wherein you can call your senior management by their first name, and you're expected to ask questions and constantly questioning ideas, and suggesting better solutions. In the Fin-Tech role, we had full end-to end technical ownership, and were expected to set our own deadlines and approach. Buddies were assigned during the project who communicated the business requirements. The role serves as a great way to network with senior members of the department and on-shore investment bankers, and helps gain exposure to the world of investment banking.

Academic courses relevant to the project: CP, OOP.

Name: ADITYA RAMASWAMY(2017A7PS0130P)

Student write-up

Short summary of work done during PS-II: Automated various parts of daily workflows of analysts using Python and Excel.

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

Objectives of the project: Build and release products.

Major learning outcomes: Time management, Python, VB, Excel.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Very high expectation of time, busy work environment. Time management will be crucial in this internship.

Academic courses relevant to the project: OOP.

PS-II Station:JPMS CIB R&A Banking(CRG)-Banking, Mumbai

Faculty

Name: Prof. Shekhar Rajagopalan

Student

Name: BHAGTANI RAHUL(2017A4PS0364P)

Student write-up

Short summary of work done during PS-II: J.P. Morgan CRG is the Middle office Investment Banking division that primarily assists the onshore bankers with financial analysis, modelling, preparing decks, etc. I interned under the ECDM team where I helped my mentor with the daily work and was taught about structured solutions by my buddy. The work primarily dealt with helping the team in pricing, modelling and preparing pitches for equity linked products (convertible and exchangeable bonds) and preparing market updates.

Tool used (Development tools - H/w, S/w): Bloomberg, PowerPoint, Excel and modelling tools

Objectives of the project: I was to assist in daily activities of the firm.

Major learning outcomes: My primary learning have been in the domain of convertible bonds and structured solutions. A company issues a convertible bond to attract investor by offering advantages of both a bond and equity share. Structured solutions is used by corporate to finance loans at different costs and different amounts using derivative products.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The mentors and peer group at J.P. Morgan are very helpful and approachable. Adequate training was provided before getting started with the actual work. My primary interactions with my mentor and bankers in Hong Kong. I was able to draw valuable insights from the work and the conversations with the bankers about the equity linked products and the markets in general. This internship has provided me a great opportunity to explore my interests and get an understanding of life in investment banking

Academic courses relevant to the project: Derivatives and Risk Management, Financial Engineering, Fundamentals of Finance and Accounting, Financial Management.

Name: JAI RAWAL(2017A4PS0407P)

Student write-up

Short summary of work done during PS-II: Building pitch-books, models and assisting on shore bankers. Performing investment banking BAU.

Tool used (Development tools - H/w, S/w): MS Powerpoint, Excel and other proprietary softwares.

Objectives of the project: Learnt about investment banking industry and perform daily operations.

Major learning outcomes: Investment banking and the real estate industry with new type of investment vehicles. Building financial models and evaluating companies.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work environment is very good and team is very supportive. Company also has good training

programs in place to ensure you learn as you work. Work hours are more as required in the Investment banking field and depends on team.

Academic courses relevant to the project: SAPM, FundaFin and BAV.

Name: PRANJAL SHUKLA(2017A4PS0634H)

Student write-up

Short summary of work done during PS-II: Involved with Debt Capital Markets (DCM) for the business as usual activities. My alignments were with Rates & FX, Corporate Finance Advisory and Special Purpose Acquisition Companies (M&A). A good mix of exposure towards capital markets, fixed income markets, derivatives modelling, capital structure, liquidity analysis, ad-hoc research work. As an intern you'll be involved in helping the team making pages based on the research that you/your team undertakes. I also get to work with the onshore bankers directly and present new ideas for certain concepts but being the giant J.P. Morgan is, they already ensure that everything that goes in a pitchbook is perfect and well thought. Your experience would depend on the team that you get aligned with but you can always reach out for more exposure to your sector heads.

Tool used (Development tools - H/w, S/w): Bloomberg, FACTSet, J.P. Morgan tools, BAMSec, Excel, Powerpoint.

Objectives of the project: Judgement of the business as usual tasks that you do. The end project would be a minor addition to our workflow. For my team, we had prepared a rating analysis and undertake a debt financing exercise for a client. Usual pattern: spreading the comps, gathering data, doing rating adjustments, peer comparison and preparing termsheets.

Major learning outcomes: Learnt about the derivatives market, FX trades and how J.P. Morgan earns through these trades. On the corporate finance end, learnt about different money raising instruments like bonds, hybrids, spin-offs, split-offs and how rating agencies treat such

activities. On the SPAC side, learnt about this new product which was in spotlight during the pandemic. Learnt about the mathematical stress testing on the important metrics for a company and how J.P. Morgan bankers look at the balance sheet of a company (primarily debt).

Details of papers/patents: None

Brief description of working environment, expectations from the company: It was WFH but still one would get the heat of Investment Banking. The company expects you to deliver high level and correct output for everything. Things like PPT hygiene and backup hygiene is a basic expectation. Since, the teams are aligned with geographies like Asia, EMEA, NA, following the timelines correctly for the projects become an important part. Although, they do not expect you to present new ideas around any topic but if you are abreast with the financial news and can find something related to your project, the bankers and heads do appreciate that.

Academic courses relevant to the project: DRM, FM, BAV, SAPM, FoFA (My alignment with 3 teams got all these courses covered).

PS-II Station:JPMS CIB R&A Data Science – Fin-Tech, Mumbai

Faculty

Name: Prof. Sai Kishor Jangiti

Student

Name: NISARG KOTAK(2017A7PS1469H)

Student write-up

Short summary of work done during PS-II: My work mostly revolved around web scraping, cleaning/filtering the scraped data and publishing dashboards made up of charts/graphs for better visualization of the data. Worked with different kinds of data like geo-spatial data, e-commerce data, finance data etc. Built a generic library using Google Maps API that is able to scrape geo-spatial data. Worked on effective proxy-rotation algorithms and also learnt how to deploy a project on GKP since the team is slowly moving towards cloud.

Tool used (Development tools - H/w, S/w): Tableau, GKP, Python, VSCode, Google Maps API, JIRA, BlobStore, Confluence, Bitbucket etc.

Objectives of the project: Supporting the equity research team.

Major learning outcomes: Work-life balance, communication skills, industry coding standards and best practices, technical skills (like web scraping, deploying projects to cloud, Google Maps API etc.), softwares like Tableau, Alteryx, BlobStore, Confluence, Bitbucket, JIRA etc.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Great work culture, very accommodative team, ready to help whenever you have any doubts. Work hours are flexible to some extent. All the people are easily approachable and great place to work. Good work is appreciated and showcased to upper management.

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

PS-II Station:JPMS CIB R&A Markets-Sales, Mumbai

Faculty

Name: Prof. Shekhar Rajagopalan

Student

Name: MOHAK DUDHANI(2016B3AB0554P)

Student write-up

Short summary of work done during PS-II: The team supports local market sales teams across Asia excluding Japan, devising, and providing pricing on derivative structures using internal pricing models as per the client requirements. The team also helps with client analysis and monitoring, providing information to the teams on their clients, preparing sales pitches etc. Preparing term sheets, confirmations, and internal risk policy / committee papers for different FX and rates products. Working with the structuring / sales desks on various flow and bespoke structuring requests, building models in excel, back-testing of strategies, reconciling back-tests prepared in parallel. You are expected to take up initiatives to come up with product ideas based on market research and analysis.

Tool used (Development tools - H/w, S/w): MS excel, VBA, PowerPoint, Bloomberg, Internal pricing software.

Objectives of the project: Assist the team in BAU and automate certain processes of mailing to improve efficiency.

Major learning outcomes:

1. The internship experience was a complete package of FX and interest rate derivative markets, covering wide range of products from basic vanilla options to exotic structured products with complex, digital payoffs.
2. Got exposed to OTC markets, understanding JP Morgan's role as a market maker and being instrumental to live deals was an enriching experience.
3. Understood the entire life cycle of a trade, from different stakeholders' economic rationale to the finer legal nuances of the deals and conventions followed.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: 1. There is a lot to learn, the team is very helpful in showing and teaching every details and helping you to grow. 2. The work can get dry and methodical at times because softwares do most of the job, but the team expects you to understand the model and the background of the trade that's happening on the backend because you have to constantly deal with structurers and traders 3. The responsibilities that you get depends directly on the enthusiasm and precision you show in your allotted work.

Academic courses relevant to the project: Derivatives and risk management, Mathematical and statistical methods, Applied econometrics.

PS-II Station:JPMS GR&C - WCS Data Science, Mumbai

Faculty

Name: Prof. Saikishor Jangiti

Student

Name: APURV BAJAJ(2016B3A70549P)

Student write-up

Short summary of work done during PS-II: Writing and running SQL queries to fetch data using PySpark, visualizing it with the help of Matplotlib and Seaborn, analyzing the data using Python and Pandas.

Tool used (Development tools - H/w, S/w): Python, Pandas, Sklearn, Matplotlib, Numpy, SQL.

Objectives of the project: Developing a data-driven alerting framework for Card and Liquidity.

Major learning outcomes: Understood how various financial instruments work, the risks behind each of these financial products, hands-on experience with feature generation, ownership of project and team collaboration.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: • Good working environment.

- There was sufficient time at the start of a project to consider multiple approaches to the problem before committing to a specific direction.
- Development of the project invited assistance from teammates, coordination with data and tech teams, feedback from risk officers as end users and guidance from senior leadership.

Academic courses relevant to the project: Data structures and algorithms, Database Systems, Foundations of Data Science, Machine learning, Fundamentals of Finance and Accounting, Financial Management, Security Analysis and Portfolio Management.

Name: RAVISANKER E(2017AAPS0433H)

Student write-up

Short summary of work done during PS-II: The objective of the project was to develop robust hourly and minutely timeseries forecasting models that can make an intraday forecast along with reliable confidence intervals. The model's forecasts will give the analyst an idea about the behaviour of the target metric in the future and can take appropriate decisions accordingly. Apart from this, I also contributed to a side project which aimed to leverage sentiment analysis for financial news articles using a BERT model.

Tool used (Development tools - H/w, S/w): Python3, SQL, Facebook's Prophet Library, Scipy, Statsmodel.

Objectives of the project: To develop a very reliable time series forecasting model that can work with data of minutely and hourly granularity.

Major learning outcomes: Timeseries modelling using FB Prophet, basics of BERT model.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: In my team, the working hours were from 12 - 9:30 PM so as to align with their US counterparts. Somedays the work load can be very high and you have to juggle between things. In terms of expectation, you should be able to deliver on the task assigned to you on time.

Academic courses relevant to the project: Foundations of Data Science, Machine Learning, Probability and Statistics and DBMS.

PS-II Station:JPMS GR&C Auto Risk Strategy Analytics, Bangalore

Faculty

Name: Prof. Siddarth Mishra

Student

Name: RWEETAM BHATTACHARYA(2016B1A20938H)

Student write-up

Short summary of work done during PS-II: Prepared weekly reports on various risk metrics. Worked on quarterly counter party assessments and tweaking pricing strategy.

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

Objectives of the project: To assess counter-party risks & compute residual values of used vehicles.

Major learning outcomes: Counter party risk assessments & residuals assessment.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Great environment, very helpful colleagues & managers. Wonderful company culture and completely flat hierarchy.

Academic courses relevant to the project: All finance courses.

PS-II Station:JPMS GR&C Auto Risk Strategy Analytics, Bangalore

Faculty

Name: Prof. Siddarth Mishra

Student

Name: CHADALAVADA KHYATHI KIRAN(2016B3A40467H)

Student write-up

Short summary of work done during PS-II: Work involves creating monthly reports on the performance of portfolio and working simultaneously on different projects or any other special requests from business partners, leaders or other teams.

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

Objectives of the project: Minimization of losses in portfolio and know the reason/source of losses.

Major learning outcomes: Learnt and working on SAS/SQL, presentation skills, communication skills.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Given that we joined the team virtually, everyone on the team was really helpful with letting us understand even the most basic things if needed. They encouraged to get involved with most of the things, be it work, presentations or the general fun sessions we had. The expectation from the company would be the person to be more enthusiastic with everything they are working on and show interest to learn more.

Academic courses relevant to the project: BAV, FM.

PS-II Station:JPMS GR&C Cards Risk Strategy Analytics, Bangalore

Faculty

Name: Prof. Siddarth Mishra

Student

Name: LAKSHITH D(2016B3AA0357H)

Student write-up

Short summary of work done during PS-II: BAU activities, credit risk strategy creation, monitoring and reporting, presenting finding to higher management and seeking approvals.

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

Objectives of the project: BAU activities, credit risk strategy creation, monitoring and reporting

Major learning outcomes: Credit risk segmentation, customer behaviour analysis, risk strategy creation and due diligence.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work from home. Team was good, helpful and great set of people.

Academic courses relevant to the project: Econometrics

PS-II Station:JPMS GR&C Corp Risk - RPS Project Management, Bangalore

Faculty

Name: Prof. Saikishor Jangiti

Student

Name: KHUSHBU VIRAL PARIKH(2017A2PS1464H)

Student write-up

Short summary of work done during PS-II: The role centered around automating reports and developing dashboards using Alteryx and Tableau. My work as an intern involves creating Alteryx workflows for automation of report, developing automation macros and dashboards to increase efficiency of existing dashboards and explore on integrating R in Alteryx. Performing user testing and then work on the enhancement requests. Other than BAU work, I was also involved in R&D work of integrating R and Python into Alteryx. The main objective of my day to day work is to help automate certain tasks, reduce manual work, and save time by reducing repetitive tasks.

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

Objectives of the project: Assist the team in BAU and automate reports to save time and improve efficiency.

Major learning outcomes: Learnt how to use Alteryx for automation of reports and how to use Alteryx to its best capacity by integrating R and Python in Alteryx. The internship has not only helped me develop my technological knowledge but also helped me embrace the work culture, business etiquettes and professionalism.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The team members and the manager were always ready to help. The work atmosphere is very friendly where you can reach out to any employee without any hesitation. To increase the opportunity of networking they also organized virtual coffee meets which helped me connect to the employees from all over the world. The company treats you like full-time employees and expects you to work with high accuracy and precision in the given time limits.

Academic courses relevant to the project: FRAM.

PS-II Station:JPMS GR&C Corporate Risk - Firm Wide Risk Reporting, Bangalore

Faculty

Name: Prof. Saikishor Jangiti

Student

Name: SHETYE SAIRAJ VIJAY(2017A4PS0526G)

Student write-up

Short Summary of work done during PS-II: The project assigned was to automate the report production process for multiple daily reports. The procedure was to build an Alteryx + Tableau solution from scratch thereby decommissioning 2 Medium Risk User tools that were used to produce the reports manually. Enough time was given to familiarize with Alteryx and Tableau softwares and even basic VBA if one is unfamiliar with it. Basic knowledge of finance is necessary to grasp the content of daily reports. Maintenance and Upkeep of User tools (mostly based on excel) was also assigned regularly and requires familiarity with Excel VBA.

Tool used (Development tools - H/w, S/w): Alteryx, Tableau, Excel VBA.

Objectives of the project: 1) Decommission 2 User tools and replace them with an Alteryx+Tableau solution 2) Reduce the actual time required for the report from 30 to 5 min / day and thereby saving over 2 hours / week 3) Add controls like input file verification, dynamic mapping and variance analysis which are either done manually or not present currently. Also automate the report commentary which is done manually.

Major learning outcomes: 1) Knowledge of how a major bank functions on a day to day basis
2) Effective presentation skills
3) Technical softwares like Alteryx, Tableau, VBA etc.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is excellent, everyone in the team is friendly and always ready to help if you reach out to them. There are many financial terminologies used in conversations that will very confusing to newcomers hence they will actively encourage you to just ask whenever you feel stuck. Being a BITSIAN there are expectations that you will deliver within deadlines and communicate effectively. It is advised to actively participate in the weekly team meetings and occasional fun activities as being WFH these are the only times when you can express your ideas to the entire team. Hours will be long, as expected from financial workplaces but there is a lot to learn in JPMC if you use your time effectively.

Academic courses relevant to the project: Basic Financial concepts from DRM or SAPM.

PS-II Station:JPMS GR&C Corporate Risk Market Risk Controller, Bangalore

Faculty

Name: Prof. Siddarth Mishra

Student

Name: ARAVIND R(2019H1490822P)

Student write-up

Short summary of work done during PS-II: Independent reverification of the data that is sent in external reporting. The data is split into segments and for each segment several reconciliations(verification activity) is performed to ensure that the financial data used for

reporting is accurate and complete, to the best knowledge. This is a repeated activity done on a quarterly basis. Apart from this I had the opportunity to work for some internal automation projects as well.

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

Objectives of the project: Performance of certain regular activity that is involved for external reporting.

Major learning outcomes: 1. Time management2. Exposure to Investment bank products
3. Tabelue 4. Introduction to Agile, SDLC.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: A very supportive workplace, all the employees are friendly and it's a flat organization, you are allowed to interact across the globe, if you have an requirement. Across the globe you will find support that you need to complete the activity or you can get the relevant information that is needed to learn more about JPMC products which you are dealing with and the management also expects you to ask questions that challenge their understanding and can help them grow to greater heights. As a whole, this is an amazing organization to work in, and I suggest if you get a chance do not pass on this option.

Academic courses relevant to the project: FRAM.

PS-II Station:JPMS GR&C Corporate Risk Credit Risk Middle Office, Mumbai

Faculty

Name: Prof. Shekhar Rajagopalan

Student

Name: NANDIGAM SANDEEP KUMAR(2019H1490854P)

Student write-up

Short summary of work done during PS-II: JP Morgan Corporate Investment bank deals with majorly financial institutions, big corporate and fund clients. JPMorgan gets into trades with these clients with various types of derivative contracts or facilities. Credit risk such as default risk, settlement risk etc. arises from such clients. Depending upon the history and worthiness of the client, trade limits are set so that the traders don't cross the risk appetite of the organization. Regularly, client performance is monitored to re-evaluate the credit risk the firm is facing and change the trade limits accordingly. Investment bank functions are divided among front office, middle office and back office. Trading desks, relationship managers are present in the client facing front office. Middle office deals with risk data operations like risk metrics updating, facility management, reference-data management, data quality, over limits investigation, annual client reviews, risk reporting etc. My team sits in credit risk middle office, specifically we gather the NAV data for the fund clients from various sources either from client websites, third party sites like Bloomberg, or directly contacting the clients and uploads into the risk systems so that trading limits are set accordingly which in turn results in better management of credit risk. I worked in various projects and BAUs that deals with data operations and automation regarding the data of fund clients.

Tool used (Development tools - H/w, S/w): MS Excel - Intermediate and Advanced skills, Excel VBA Macro programming.

Objectives of the project: 1) GAP analysis & QC project: Quality check project is to perform the quality check on historical NAV and performance data of the funds. If there is any missing data or high variances, try to find them in the sources mentioned or report if any inconsistencies and update into risk systems. 2) Chaser UT development: Developed as utility tool for the team to automatically send chaser mails to the fund clients who has not submitted their NAV and

performance figures as per the agreement. Technology used was Excel Macro-VBA 3) Client Email contact project: This project aim is to update the latest client contacts into workflows and eliminate outdated contacts. This improves communication between parties and also fastens availability of the NAV figures 4) SOPs project: The project is to taken up to reduce the number of SOPs in CRMO across the globe. Merging some SOPs and retaining few in order to reduce the duplication of work across CRMO. My job was to communicate with all the stakeholders and find new owners of the SOPs and get target dates for the SOP updating and timely intimate the owners about their deadlines. Excel Pivot table were used for SOP dashboards.

Major learning outcomes: •As a part of the internship, I learnt how investment bank functions and how various business processes are distributed among the teams.

- I learnt how the risk data is applied to minimize the risk faced by the organization.
- I learnt advanced Excel Skills like V-lookups, Pivots, Excel Macros-VBA etc.
- Certain soft skills like teamwork, problem solving skills, work ethics, adaptability skills, communication skills, responsibility, time management are an obvious outcome during this internship.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment at JP Morgan is very professional. Everything was planned well onboarding, trainings, assignment of work etc. Learning is very exponential, very good growth opportunities. Work organization is very much hierachal and needs constant reporting and communication.

Academic courses relevant to the project: Financial Risk Management, Security & Portfolio Management, Corporate Finance & Taxes, Financial Engineering from the college were helpful.

PS-II Station:JPMS GR&C Credit Forecasting Strategy, Bangalore

Faculty

Name: Prof. Siddarth Mishra

Student

Name: YASH PALIWAL(2016B3A80289G)

Student write-up

Short summary of work done during PS-II: I worked on two projects. The first one involved automation of an existing excel tool using advanced excel techniques. The second was based on attribution analysis which involved running a forecasting model, finding whether the model is performing well or not and to see if the model error is within an acceptable range.

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

Objectives of the project: 1. To automate the report making tool 2. To continuously examine the model and see if the model error is within an acceptable range.

Major learning outcomes: 1. Soft skills 2. Jupyter notebook 3. Advanced excel 4. Tableau 5. Python.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment is great to start your career. People are really helpful.

Academic courses relevant to the project: FRAM.

PS-II Station:JPMS GR&C Quantitative Research Fin-Tech, Mumbai

Faculty

Name: Prof Sai kishore Jagniti

Student

Name: DAKSH GUPTA(2016B3A70500P)

Student write-up

Short summary of work done during PS-II: Created tools for analysis, automation and optimization of workflow. I also involved in BAU, support and core activities of the team.

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

Objectives of the project: To create investible indices.

Major learning outcomes: Proficiency in tradable investable products, end to end working on a project and also the SDLC cycle.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Good learning environment.

Academic courses relevant to the project: FINE, OOP, DRM, SAPM, DBS.

Name: MUKUNDHAN JAYARAMAN(2016B4A70355H)

Student write-up

Short summary of work done during PS-II: The quantitative research team builds sophisticated mathematical models, methodologies and tools to develop new products, manage risk and support investment decisions. The projects done so far lies in the realm of software development and time series management.

Tool used (Development tools - H/w, S/w): 1. Python2. MS-Excel.

Objectives of the project: (i) Anomaly detection and remediation of time series data feeding VaR (ii) Automating tasks within MRQR time series analysis team to save man-hours. The MRQR time series analysis team ensures that the time series used in the calculation of VaR are correct.

Major learning outcomes: 1) How the VaR calculation framework is structured in JP Morgan
2) How time series management is done by the firm.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I completed the internship in WFH mode. The work is fast paced and issues that crop up needs to be dealt quickly.

Academic courses relevant to the project: 1) Object Oriented Programming2) Derivatives & Risk Management 3) Financial Risk Analytics & Management4)Computer Programming.

Name: ISHIKA KUMAR(2017A3PS0320H)

Student write-up

Short summary of work done during PS-II: Written implementation of tradable strategies for indices.

Tool used (Development tools - H/w, S/w): Internal version of VSCode.

Objectives of the project: To sell the strategy to the clients.

Major learning outcomes: Financial and coding knowledge of indices and risk setup.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is conducive for learning, had many talks on analytics and role of data science on managing information.

Academic courses relevant to the project: Disco, ML, finance courses.

Name: TULIKA JHA(2017AAPS0364H)

Student write-up

Short summary of work done during PS-II: The aim of the first project was to predict the direction of two-way trades that ultimately resulted in a buy or sell. The first half of the project involved a lot of exploratory data analysis on the dataset. It was then followed by strategy-wise analysis of the statistical bias towards buy. This was analysed for two popular indices. Bias towards buy was studied and plotted for different time frames like annual, bi-annual, quarterly and monthly. Post this, several attempts at making a classifier for the buy-sell prediction were made, that used this market information (clustering data) along with other features containing strike information and the Greeks. Models were made for prediction of buy or sell for two-way RFQs for two indices. These models performed satisfactorily well, when trained with Random Forest classifier. In addition to this, dashboards were made using Flask to monitor the

availability and readiness of datasets and to monitor email reports. Email alerts were sent every 'x' minutes to bring attention about these failures.

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

Objectives of the project: Side prediction of two-way RFQs, infrastructure related work like dataset and Email monitoring dashboards.

Major learning outcomes: Learnt coding in Python, unit testing, building apps and dashboards using Flask.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is cordial and everyone in the team is helpful. It is also challenging at times and your responsibilities are at par with the full-time employees of your team.

Academic courses relevant to the project: Object Oriented Programming, Machine Learning, Neural Networks and Fuzzy Logic.

PS-II Station:JPMS GR&C WCS Process Strategy, Mumbai

Faculty

Name: Prof. Shekhar Rajagopalan

Student

Name: HRISHAV RAJ(2016B3A40555P)

Student write-up

Short summary of work done during PS-II: My work was based on the role of a product manager. It involved strategic planning and execution of change management projects aimed at transforming the bank's competitive edge in the market. This comprised of end-to-end planning, gathering requirements from users, designing and delivery of products through a collaboration between business and technology teams.

Tool used (Development tools - H/w, S/w): MS Excel, Jira DC GTI, SQL.

Objectives of the project: To deliver quality products in the estimated time duration.

Major learning outcomes:

1. Learnt in detail about different line of businesses within the firm and the underwriting involved.
2. Learnt the process of strategic deployment of new functionalities.
3. Learnt how to manage project sprints and pre-plan to deliver on the expected dates.
4. Learnt how to gather requirements from users and write Jira stories in order for the technology teams to build from that.
5. Learnt how to do positive and negative testing of the product to find and resolve bugs.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The people here at JPMC are smart and very humble in their approach to their professional lives. Their diversity not just in India but around the globe speaks truly of the competitive edge the firm gets from different perspectives. Employees are motivated by their peers and senior management to perform well, take initiatives and responsibilities even at the entry-level.

Academic courses relevant to the project:

1. Financial Management
2. Security Analysis and Portfolio Management
3. Business Analysis and Valuation
4. Principles of Economics
5. Principles of Management
6. Fundamentals of Financial Accounting
7. Econometrics
8. Business Communication.

PS-II Station:JPMS GR&C Wealth Management Data Science Credit Risk, Mumbai

Faculty

Name: Prof. Saikishor Jangiti

Student

Name: SAYANTI GHOSH(2017A7PS0261H)

Student write-up

Short summary of work done during PS-II: There were 2 projects. One project required data extraction from documents using OCR, and the second involved data analysis with Python for drawing business insights.

Tool used (Development tools - H/w, S/w): Python (Pandas, Tesseract OCR), Alteryx, Excel.

Objectives of the project: Automation of data extraction from documents to reduce manual time and effort, and to make better credit analysis decisions using proper data analysis.

Major learning outcomes: Data analysis, use of Python & Alteryx, working in a corporation.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Nice work environment, teams were helpful and understanding.

Academic courses relevant to the project: DSA, DAA, FODS.

PS-II Station:JPMS Software Engineering Program, Bangalore

Faculty

Name: Prof. Saikishor Jangiti

Student

Name: NISHANT CHITKARA(2017A7PS0074G)

Student write-up

Short summary of work done during PS-II: The main aim of the project is to get detailed analysis of all ultra high networth individuals and many statistics that would not be visible directly. The primary use of this is to find similar people to any given person and also calculate the strength between any two given people. This would be computed using parameters like networth, age, primary industry, position, company, and most importantly graph topology.

Tool used (Development tools - H/w, S/w): Python, Neo4j, AWS, Git, Python libraries(pandas, numpy, sklearn, pytorch, networkx, etc).

Objectives of the project: Get similarity and strength between any two high networth individuals.

Major Learning Outcomes: Got good experience of how to collaborate with other team members living in different time zones.

Overcoming time and language barriers that was initially not as easy.

Learnt how to work in a team and achieve as a team.

Learnt new technologies like Neo4j, AWS services, BitBucket, etc and concepts like Graph databases, Data science algorithms on graphs, etc.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Great working and learning environment. Senior members are very supportive and always ready to guide and teach interns and other juniors from their experience. Also, I have a decent knowledge about finance, just because learning culture is great. Last but not the least, JP Morgan provides a great work-life balance as well.

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

Name: PALLAV DEVANG RAVAL(2017A8PS0615H)

Student write-up

Short summary of work done during PS-II: In the current pandemic times that we live in, online meetings are the new normal in our society. Online meetings however, are not the same as in person meetings. We are able to identify the effectiveness of in person meetings through visual and cognitive means, however online meetings do not offer the same because the camera only captures the face. Online meetings also present a different set of challenges in terms of connectivity and willingness of individuals to participate in the online meeting. Because of the virtual environment, individuals are less likely to participate in the conversation. The aim of this project is to measure how engaged are individuals in an online meeting, to find out valuable insights into how online meetings can be improved and be made more interactive. Engagement estimation can be done broadly three main ways — manual, semi-automatic and automatic methods. The manual ways of estimation engagement are by providing self-reporting and observational checklist. In the semi-automatic method, we can do engagement tracing of the timing and accuracy of learner responses to practice problems and test questions. The approach that we take is the automatic approach which is done through computer vision methods, where we analyse the individual's facial expression, head position and other visual clues.

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

Objectives of the project: The aim of this project is to measure how engaged are individuals in an online meeting, to find out valuable insights into how online meetings can be improved and be made more interactive.

Major learning outcomes: Python, Javascript, Machine learning.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Good working environment, achievable expectation from company.

Academic courses relevant to the project: Data Structures and Algorithms, Operating Systems.

PS-II Station:JPMS Software Engineering Program, Mumbai

Faculty

Name: Prof. Saikishor Jangiti

Student

Name: SIDDHANT BHATT(2017A3PS0593H)

Student write-up

Short summary of work done during PS-II: The major project which I worked on was Pentaho version upgradation of regulatory reports. Previously, the team used Pentaho 5 for the process of report generation but now we needed to upgrade to Pentaho 7 as it has more added features and functionalities and is also compatible with the latest version of Java JDK. Some other small projects were implementing Java application which helps in changing value of keys inJson, and also worked on implementing observability for a Kubernetes application.

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

Objectives of the project: Pentaho version upgradation was required for improving the efficiency and stability of the regulatory report generation process. Kubernetes and observability work was more learning oriented.

Major learning outcomes: Learnt about Pentaho software (ETL Tool), Kubernetes and its architecture, observability - tracing and logging.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work environment is good and every one is very helpful. You just need to be proactive in asking for projects you want to work on.

Academic courses relevant to the project: OOP, DBMS.

Name: NEAL ANIRUDDH MENON(2017A7PS1219H)

Student write-up

Short summary of work done during PS-II: I worked on 2 projects during my time at JPMC. During the first half, I was tasked to build and maintain some dummy services so that we could test our observability tools on them without affecting existing codebases. The second was more

coding intensive project wherein I optimized the working of the data quality engine by creating 2 new services. The new services have been performance tested and are ready to be prepared for production release.

Tool used (Development tools - H/w, S/w): Project 1. Spring boot, Prometheus, Grafana, some internal JPMC tools, Jenkins, Splunk Project 2. Apache Kafka, Apache Avro, Apache Drill, Spring boot, Jenkins, Unix scripting, Apache Maven.

Objectives of the project: P1: To help modernize the group's service by introducing modern observability practises P2: To optimize high priority service that was hogging resources and causing issues with other aspects of the service.

Major learning outcomes: Modern industry practises, building a new production grade service from scratch, working in a bank setting.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Team is extremely supportive though and will answer any questions you have without hesitation.

Academic courses relevant to the project: OOPS, Software Engineering, DBMS.

PS-II Station:Kickdrum Technologies India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Pravin Pawar

Student

Name: KHARAT AJAY DILIP(2019H1030011G)

Student write-up

Short summary of work done during PS-II: During Internship we went through different phases:-

- 1) Jan-Feb: In-depth training, assignments, homeworks, quizzes.
- 2) Feb-March: Big team assignment that uses all learning in training.
- 3) March-June: Real time project in a team.

In training, we have to give performance evaluation test on React, Java and AWS. Weekly/monthly, we have to present our progress/update/work to Interns(KDU's) and stakeholders separately. We have daily SCRUM meeting in morning and evening to discuss our plan for a day, challenges we face and goals.

Tool used (Development tools - H/w, S/w): Learnt and apply new skills during our internship:

Amazon Web Services (AWS), HTML/CSS/React (frontend), Java/Spring (backend)

- 1) IntelliJ for Java and Backend
- 2) Visual studio for HTML/CSS/React i.e Frontend
- 3) Figma for UX

Objectives of the project: To design, built, test and deploy a interactive searching model in production. One of the primary objective when building this was to enable faster iterations. This capacity build should allow for incremental improvements.

Major learning outcomes: The tools, practices and ideas from KDU have cleared up the basics of all 3 tracks (AWS, Java and React) really well, and this has helped me a lot with React and AWS. I am able to find things quickly and know the correct usage of services. The hands on AWS skills were really helpful.

- 1) Quick learner
- 2) Minimal hand holding
- 3) Focus to reach the objectives

Details of papers/patents: Title:- Emotion Recognition Using Multimodalities.

https://link.springer.com/chapter/10.1007%2F978-3-030-73050-5_31

Brief description of working environment, expectations from the company: The 6 months PS experience helped me to imbibe corporate culture. I learnt to face complexities and to manage expectations, all in a fun and safe environment. The work has broadened my knowledge of programming which would certainly augment my future career prospects. Apart from work, recreational activities like organising a digress sessions by HR, monthly success bash, food reimbursement has made my internship a full-fledged one.

Academic courses relevant to the project: 1) Research Practice course helped me a lot to approach the problem statement and come up with solution2) Software architecture helped me realize the field of implementation of the courses which I had studied in college.

Name: PARTH SUDHIR BHOPE(2019H1030023H)

Student write-up

Short summary of work done during PS-II: I worked in a project in the domain of Natural Language Processing. The project was about auto suggestion of JIRA tickets on the basis of data collected from various events in softwares used by programmers like source control systems, calendars, meetings, text editors. The data of events goes through several steps of data preprocessing, feature extraction before being fed to the recommendation model that predicts the JIRA ticket the user was perhaps working on and so that entry to be made in the time sheet software is automated. I implemented various models of word embeddings and experimented with few supervised learning models for achieving the objective of the project.

Tool used (Development tools - H/w, S/w): IntelliJ, VSCode, Amazon web services.

Objectives of the project: How might we recommend a timesheet entry for Tempo's customers so that the process of making a timesheet entry is automated.

Major learning outcomes: Working in a team, understanding ideas presented by peers, understanding the data collected, making sense from the data, applying various NLP techniques, scoring the test data, analysing and visualising the results.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The company has very transparent culture and a flat hierarchy so the environment is very friendly and people are approachable and helpful. The company expects the intern to be curious, willing to learn and do a good job on the projects. If someone needs help and consultation, the seniors at the company provide valuable advice.

Academic courses relevant to the project: Machine Learning.

Name: ABHIJEET UPADHYAY(2019H1030121H)

Student write-up

Short summary of work done during PS-II: Cleanly: I was asked to develop a portal where people can submit the request for cleaning related services. We are divided into group of 3 and we make it end to end using technology stack given below.

- Frontend: React
- Backend: Java, Spring framework
- Deployment: AWS cloud

PE-Library: To develop a portal where we can feed the documents(slides/docs) into a portal and making them searchable.

Technology Stack:

- Frontend: React
- Backend: AWS Lambda
- Deployment: AWS S3
- Search functionality: AWS Elasticsearch

Tool used (Development tools - H/w, S/w): H/W-Dell latitude 7490.

S/W-VS Code, IntelliJ Idea, Github.

Objectives of the project: 1. Cleanly: To develop a portal which can cater the needs of urban lifestyle and make their cleaning experience hassle-free 2. PE-Library: To provide a portal where any new analyst can search through existing assessments, making the write-up for new assessments easy for the analyst.

Major learning outcomes: Learnt about new technologies like React, Spring framework.I also learnt about industry standards of writing maintainable and extensible code as well as professional communication.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Company has great learning environment. All people at different levels are technology enthusiasts.My expectations from the company is to have a great learning environment and work on latest technology.PS is able to fulfil my expectations, they are very flexible in providing you the kind of work you want and provided training. They train all the internswith the best training material and content. All the trainers are industry professionals with good experience in problem solving and building products.

Academic courses relevant to the project: Cleanly and PE-Library: Course relevant with the project is Advance algorithms, OOAD.

Name: UTKARSH KOSTA(2019H1030600H)

Student write-up

Short summary of work done during PS-II: The 6 months duration of the internship is divided into 3 phases. The 1st phase consisted of a training program offered by Kickdrum to their interns for 2 months. The 2 month training program is followed by a 1 month KDU (Kickdrum University as they call their batch of interns) project in which the interns are assigned to different

projects. Finally, the remaining 3 months, the interns are provided projects based on their requirements.

The 2 month training program consists of well planned out and informative regular sessions on the 3 tracks of development in Kickdrum - Frontend (React JS, HTML, CSS etc.), Backend (Java, Spring), AWS. The training program concludes with final assignment which requires interns to work in teams of 3 to build website based on the requirements provided.

After the training, I had the opportunity to work on 2 POCs - first on a Kickdrum customer project and the other for mobile app development using Flutter. I worked on few AWS S3 file backup scripts for another project as well. Finally, I was involved in migrating JIRA project from one cloud instance to another with management team.

Tool used (Development tools - H/w, S/w): AWS, React, HTML, CSS, Flutter, Node JS, Java Spring, UiPath automation.

Objectives of the project: The first project required our team to provide a POC for UiPath automation testing tool. The tool had to be evaluated to be utilized by Kickdrum customers for validating their complex airline scheduling interface. For the second project, we had to develop a template mobile application interface using Flutter framework, Dart and provide detailed analysis of the performance and limitations of the same. As a small, short duration requirement I was involved in working on NodeJS scripts to create a real-time backup of AWS S3 instances. Finally, I was involved in migrating JIRA project from Kickdrums instance to one of their customers. This required rigorous research into project management and custom data stored in projects. Migrating the project is a non-trivial task as of now since JIRA does not provide single project migration feature.

Major learning outcomes: Most of the technologies I had an opportunity to work on was a new experience for me. The Kickdrum version control standards and software engineering practices provide a really good foundation to build upon.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The Kickdrum team is extremely supportive to their interns. Every member is always available to help and guide interns at a moments notice. Kickdrum expects genuine effort and a learning attitude as they believe in providing and receiving constructive feedback.

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

PS-II Station:Kizora Software Pvt. Ltd., Nagpur

Faculty

Name: Prof. Vijayalakshmi Anand

Student

Name: RITWICK JHA(2016A8PS0384P)

Student write-up

Short summary of work done during PS-II: The objective of the project is to identify checkboxes in a checklist and classify them as checked(marked) or unchecked(unmarked/blank). We are using Machine Learning to create a model to achieve this task. The model will identify checkboxes from a checklist and will classify the checkboxes in the checklist into the aforementioned two categories. The first step of the project was to create a basic model. The program will be given a sample input in the form of training data. The data contain two different directories of images. The next step of the process is increasing the size of the dataset from a sample size of 200 images to a size of 4000 images. Then we use mlflow and integrate the model with it so that it can give a proper view of our parameters and results and help us in analyzing the results so that we can get the most accurate results after finetuning its parameters. The model needs the presence of few more support file for handling its operation. We then mostly focus on building support files for the model so that it becomes more user friendly and also eases the use of the model. The model is ready to predict the data so we use mlflow serving to host the data on a server such that files could be sent to the model for

predicting and classifying remotely. We then create a basic webpage using HTML/CSS where the input image or document can be uploaded and the result can be printed. We then used Django to integrate the website with our model.

Tool used (Development tools - H/w, S/w): Python, OpenCV, Google Colab, Jupyter, Anaconda,

Objectives of the project: The objective of the project is to create machine learning binary classification model to identify checkboxes in a checklist and classify them as checked (marked) or unchecked(unmarked/blank).

Major learning outcomes: Learnt various concepts of machine learning from the grass root level.

Learnt how to use ML Flow platform for model serving.

Learnt how image classifiers are coded and how to build machine learning models.

Learnt how convolutional neural networks work and how to use them.

Worked with different Python libraries and learnt how to use them.

Learnt how to integrate backend to a website.

Learnt the basics of user interface.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Due to lockdown of the state we were told to work from home. We had a daily call with our project lead to discuss the objectives of the work and the status report about any previous assigned work. If we had any doubts or problems we could assign them on the team channel so anyone who is not busy would be able to help us with it. We also had weekly call with all the members of the company to have discussions.

Academic courses relevant to the project: Neural Network and Fuzzy Logic.

Name: MOGALI LOKESH(2017A3PS0296P)

Student write-up

Short summary of work done during PS-II: we wanted to create a web service that will automate the process of reading checklists and collecting data. For that we used different ocr techniques to extract checkmarks from checklist and those checkmarks were fed to a machine learning model. We created this binary classification machine learning model using CNNs and the final results to be provided to the end user.

Tool used (Development tools - H/w, S/w): Spyder, Google colab, MLflow, Github.

Objectives of the project: Checkbox classifier using machine learning.

Major learning outcomes: Learnt various areas of machine learning,opencv,ml model building,boxdetect,django projects, figma prototypes and handling Github project.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Had a great working environment. Our instructor also treated us very well and even CEO also was in touch from time to time.

Academic courses relevant to the project: 1. Neural Networks& Fuzzy Logic 2.Digital Image Processing.

Name: CHOPDE EASHAN JAYANT(2017A3PS1161P)

Student write-up

Short summary of work done during PS-II: PS-2 project at Kizora software involved the design of UX backbone of multiple Kizora client services. The work involved a comprehensive analysis of client needs in order to improve existing user experience flows in the product. The PS involved multiple projects over a span of 6 months giving an invaluable exposure to different angles of the field of UI/UX design. The work at Kizora Pvt. Ltd., allowed me to explore and apply for more jobs in the same field.

Tool used (Development tools - H/w, S/w): Figma, Adobe Illustrator, Adobe XD, Adobe Photoshop, GIMP.

Objectives of the project: Improving UI/UX needs of Kizora products.

Major learning outcomes: User empathy, Product design, Design flows, User interaction research, Design case studies.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment at Kizora Software Pvt. Ltd., was an inclusive and positive experience for me. I was always approached by employees in order to interact and gain more knowledge of the company as a whole. Deadlines were strictly enforced, and there was always someone ready to help. Kizora Software Pvt. Ltd., provided a model approach to problem solving while taking into consideration the needs of the people working there.

Academic courses relevant to the project: Neural Networks& Fuzzy Logic, Digital Image Processing.

Name: PASUPULETI ACHYUTH SAI MADHAV(2017A8PS0833H)

Student write-up

Short summary of work done during PS-II: The project was primarily based on Machine Learning. We, a group of 3 Bitsians were allotted the project. The objective of the project was to develop a Machine Learning model to classify the checkboxes present in a checklist into two broad categories, namely, checked and unchecked. We were also assigned the task of serving the developed ML model as a web service for users to use. We had to create a dataset to train the ML model on our own due to lack of pre-prepared datasets. We used MLFlow to log the results and parameters of the model to compare metrics like accuracy, F1 score, etc. We also created a basic UI for the website on which the model is served as a service. The 3 of us had to learn everything from scratch as we did not have prior experience with Machine Learning or Data Science. Our team leader was very helpful, patient with us during the learning process and gave us enough time and resources to learn Machine Learning. I was assigned a task(unrelated to the project mentioned above) of learning Rhinoceros 3D software(a CAD software just like AutoCAD) and design a basic 3D model using the Grasshopper plug-in in Rhino.

Tool used (Development tools - H/w, S/w): Google Colab, Anaconda, MLFlow, Spyder, PyCharm, Rhinonceros 3D.

Objectives of the project: The objective of the project was to develop a Machine Learning model to classify the checkboxes present in a checklist into two broad categories, namely, checked and unchecked and to deploy the model as a web service.

Major learning outcomes: Machine Learning (from the grass root level), MLFlow platform, Image classification, basics of web-designing.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment was amazing. Our team leader was extremely helpful and gave us ample time and resources to learn Machine Learning. Everyone was extremely helpful and they were always ready to help us whenever we faced any issues. The atmosphere was very positive. The best way to summarize the employees at Kizora is that they are bunch of very nice people with a helping nature. They had immense faith in us, trusting interns with no prior experience in data science with a Machine Learning project.

Academic courses relevant to the project: Object Oriented Programming, Machine Learning.

PS-II Station:KPIT Technologies, Bangalore

Faculty

Name: Prof. Dinesh W Wagh

Student

Name: K CHINMAY(2019H1060507G)

Student write-up

Short summary of work done during PS-II: Currently part of CAE team at KPIT. Working on static structural contact analysis of various engine mountings. My work is to perform complete FE analysis using Ansys workbench.

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

Objectives of the project: To understand the behaviour of various mountings after performing FE analysis and share the observations.

Major learning outcomes: Industrial approach to FEA, better understanding of Ansys workbench, time management, dynamics of corporate world.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment at KPIT is excellent. Manager, mentor & HR personnel have been extremely supportive and helpful.

Academic courses relevant to the project: Finite Element Method. The industrial methodology of FEA is much detailed when compared to academic methodology. Probably if the FEM course was more FEA tool oriented than theoretical it would help.

PS-II Station:KPMG, Bangalore

Faculty

Name: Prof. Sandeep Kayastha

Student

Name: ALIASGHAR ABEZER VALI(2019H1490820P)

Student write-up

Short summary of work done during PS-II: As an intern at KPMG, I have worked under the Technology, Media and Telecommunication sector, functional team to deliver projects which involve conducting competitor analysis, market landscaping reports, software assessment and recommendations, vendor benchmarking, business development activities and sector analysis reports. All projects involved phases such as scoping, researching, synthesizing, formulating, executing and delivering. According to the nature of the project, tools such as Factiva, Newsdesk Lexis Nexis, Capital IQ, Thomson One, Market Line, Cushman and Brandwatch were leveraged so as to deliver sound research with relevant insights to clients. The deliverables were provided in the MS Word, MS PowerPoint or MS Excel. For all projects collaboration took place across MS Teams, Skype and other internal platforms. For each

project, teams were allocated in a projectized format, with each team being led by a project manager. Additionally, each intern/employee receives a feedback from his/her performance manager who may or may not be the project lead. After each project, a result readout was set up to explain the contents and the approach to clients and to accommodate any changes/modifications as per requirements.

Tool used (Development tools - H/w, S/w): Hardware Tools leveraged: HP Laptop, KGS VPN, Wifi Hotspot.

Software Tools leveraged: Brandwatch, Capital IQ Database, Newsdesk Lexis Nexis database, ThomsonOne database, Factiva, MS Excel, MS PowerPoint.

Objectives of the project: The internship comprised of delivering projects centered around technology advisory services such as research, POV and other reports with a projectized approach.

Major learning outcomes: 1. Learnt how to conduct research with T- coverage of information.
2. Learnt the use of various database, social media analytics and presentation tools.
3. Learnt additional skills like RPA and R to improve and supplement the research quality of deliverables.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: KPMG Global Services caters to all the three broad services - tax, audit and advisory- provided by KPMG, it acts as the cost center and other member firms act as the revenue center. I have worked as part of the research & benchmarking team which is further subdivided into teams that support specific geographies like US, UK, Singapore and India, business units like tax, risk consulting, deal advisory and global collaborations & knowledge and functional teams like Technology, Media and Telecommunication (TMT), Healthcare & Lifesciences (HCLS), Industrial & Automotive (I&A), Energy & Natural Resources (ENR), Consumer & Retail (C&R) and the Financial Services (FS) sectors. The working environment has been virtual throughout the duration of the internship. However, the company had provided me a laptop and all other necessary equipment for working remotely. In terms of virtual interactions, I have been able to interact and coalesce extensively with people across the KGS network, and also with top

management through planned sessions. The working environment has been extremely welcoming and accommodating, as a part of the Telecom, Media and Technology sector team for tech advisory services I have been able to deliver multiple projects across various client geographies over the tenure of this internship due to the global nature of team. This has additionally helped me in understanding subtle cultural cues that exist while communicating with international teams. Overall, the work experience has been satisfying and growth instilling.

Academic courses relevant to the project: Marketing, Quantitative Methods, MIS, Managerial Skills, Business Communication, Finance and Accounting, Business Analysis and Valuation.

Name: KSHITIJ SHUKLA(2019H1490826P)

Student write-up

Short summary of work done during PS-II: The work revolved around understanding of various forms of taxes and working on projects related to corporate taxation. Major task was researching and analyzing complex tax scenarios and presenting them in simpler form. Some projects involved competitor analysis in various tax capabilities as requested by the client and benchmarking.

Tool used (Development tools - H/w, S/w): Office Suite, Several Databases.

Objectives of the project: To perform primary and secondary research in the area and provide the client with desired results in simplified way.

Major learning outcomes: Understanding of annual reports, corporate taxation, tax treaties, transfer pricing, taxes in different jurisdictions along with ratio analysis and benchmarking.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work culture at KPMG is excellent being both inspiring and motivating at the same time. Due to

COVID-19, the onboarding was done virtually but everything was conducted smoothly and welcome in the team event was conducted where brief introduction was given by all the team members. All the team members were approachable irrespective of their designation and role.

Academic courses relevant to the project: Corporate Finance and Taxation, Financial and management accounting, Business Analysis and Valuation.

Name: VIGNESHWARAN S(2019H1490839P)

Student write-up

Short summary of work done during PS-II: My PS-II at KPMG Global Services, also known as KGS, had been nothing short of an amazing learning experience. The projects I undertook majorly focused on research and benchmarking as per request of several KPMG global units. These requests focuses on a variety of industries and geographical areas. Research and benchmarking includes areas such as financial benchmarking, vendor benchmarking, tool benchmarking, functionality benchmarking, etc. Some projects gave me the opportunity to carry out financial analysis, industry analysis, competitor research and market survey. This provided equal opportunity to learn how to do both primary and secondary research at a professional level. Depending on the clients problem key performance indicators (KPI) were identified and framed for analysis. The data collected from various databases, government websites and international organizations who published reliable data. The above collected data were analyzed and insights were gathered. These insights were then put into a PPT deck and shared with the clients.

Tool used (Development tools - H/w, S/w): MS Excel and MS Powerpoint, Database such as CapitalIQ, Euromonitor, Economic Intelligence Unit, etc.

Objectives of the project: Since the nature of my projects were short term (between 2 weeks to 4 weeks), I was able to cover around 12 projects during the entire PS-II. Though the objectives vary from project to project, it can be categorized under certain broad umbrellas such

as benchmarking the performance of a client against its competitors, location assessment of various countries based on client needs, market or industry analysis to find insights from a particular industry, etc.

Major learning outcomes: It includes how to professionally do a primary and secondary research, working with advanced Excel functionalities and macros, professionally creating a PowerPoint deck, identifying the key performance indicators for various industries, doing financial analysis and competitive research, using various database and database aggregators, analyzing data and gathering insights from the collected data. The internship also gave me the opportunity to learn non-technical things which are part of the professional environment such as effective client interaction, presentation skills and soft skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment at KPMG Global Services was very professional. The organization provided us many opportunities to learn and to get our hands dirty by doing groundwork and gaining the experience. The team and my manager were really friendly and motivated me to ask questions, make mistakes, learn during the process and correct them. The company's expectations from the interns was to learn and deliver results based on the learning. They expected me to take up responsibilities such as organizing meetings, client interactions on the project I have worked upon and maintaining a high level of professionalism during the entire process. At the end of the course, I strongly could feel the change both in my technical and non-technical skills.

Academic courses relevant to the project: Market Research, Corporate Finance, Human Resource Management, Business Process and Strategic Management.

PS-II Station:L & T Infotech, Pan India (Location)

Faculty

Name: Prof. Sonika Rathi

Student

Name: EASHAN SAPRE(2017A3PS1158P)

Student write-up

Short summary of work done during PS-II: Building a custom CMIS technology connector for DELL Boomi Platform. The project is under of cloud integration. We were asked to build a custom technology connector for Dell Boomi, an IPaaS (Integration Platform as a Service). Development was done primarily in J2EE and Dell Boomi libraries.

Tool used (Development tools - H/w, S/w): Java, J2EE, Maven, Postman.

Objectives of the project: Building a custom CMIS technology connector for DELL Boomi Platform.

Major learning outcomes: IPaaS connector development.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work environment was good. Mentors were helpful and guided us through the project. We were given an exciting and challenging project to work on. Deadlines are tight and more work input can be expected.

Academic courses relevant to the project: Object Oriented Programming (OOP).

PS-II Station:Leameng Solutions, Pune

Faculty

Name: Prof. Sudeep Kumar Pradhan

Student

Name: GOHIL PARTH SHAILESHBHAI(2019H1410084G)

Student write-up

Short summary of work done during PS-II: Design and development of lightweight composite material tailgate for xEV SUV, automobile lightweighting related project. Worked on benchmarking, material selection, 3D BIW design preparation, DVP- Design Validation Plan, BOM- Bill of Material, FEA analysis and design improvements, etc.

Tool used (Development tools - H/w, S/w): ANSYS 2020 R1, CATIA V5, CREO 7.0, LATEX-editor- TEXMAKER.

Objectives of the project: Develop a lightweight composite material tailgate.

Major learning outcomes: Learnt about automobile body component design, BIW design and analysis.

Details of papers/patents: In process

Brief description of working environment, expectations from the company: It was work from home, my mentor was supportive during entire duration of the project and provided proper guidance wherever required.

Academic courses relevant to the project: CAAD- Computer Aided Analysis & Design

Name: DEEPAK KUMAR(2019H1410587P)

Student write-up

Short summary of work done during PS-II: Design and development of light weight tailgate for reducing weight and improving efficiency in the case of SUV vehicles.

Tool used (Development tools - H/w, S/w): UG NX-CAD, CATIA, ANSYS.

Objectives of the project: Design and Development of lightweight tailgate.

Major learning outcomes: 3D CAD modelling; Simulation- Structural, Thermal, Transient; Composite Material Selection.

Details of papers/patents: Under progress

Brief description of working environment, expectations from the company: Good work environment, supportive coordinator or guide, got real time insight into industrial automotive design.

Academic courses relevant to the project: Computer Aided Analysis & Design

PS-II Station:LTTS, Vadodara

Faculty

Name: Prof. Glynn John

Student

Name: ABHISHEK SINGH(2019H1410594P)

Student write-up

Short summary of work done during PS-II: In current markets, flexibility is needed for every FMCG company as competition grows exponentially. Adapting flexibility in packaging lines pose a challenge in some ways considering the variability of products that are requested to be produced from an equivalent packaging equipment at minimum downtime and faster delivery to consumers. Product acts as a "silent marketer" for itself. It attracts attention of many customers, just by silently sitting on the shelf. Sometimes packaging is so important that it costs quite the merchandise itself so as to lure the consumers to shop for it.

Objective is to make a pilot line design which may cater a good range of products and may be interchanged for minimum order quantity. This may involve defining a design which might be modular (such as in container) that can be mobile and thus meets varying needs of consumers on the go. Various options were prepared. After best value option analysis, one option selected have facility to store the products and deliver the packaged product as per predefined combination of products.

Tool used (Development tools - H/w, S/w): Auto CAD, Solid Works, MS Excel, MS Word.

Objectives of the project: 1) Line designing for flexible packaging system 2) Designing of "Near To Customer Unit" to cater customer demands on the GO.

Major learning outcomes: 1) Major understanding of plant functioning 2) Processes involved in "Bottle Packaging Plant" 3) Designing and optimization of "Bottle Packaging Plant".

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Company environment is very positive. All the employees from junior level to senior level are very supportive. Company provides positive environment and resources to learn and develop but at the same time expects some game changing solutions as well.

Academic courses relevant to the project: Product Design, Computer Aided Design.

PS-II Station:Lucas TVS Ltd., Pondicherry

Faculty

Name: Prof. Glynn John

Student

Name: SWAROOP T M(2019H1060034G)

Student write-up

Short summary of work done during PS-II: The regulator is an electronic device which is coupled with automotive alternators. Automotive alternators require a voltage regulator to produce a constant voltage at the battery terminals. Because of high demand, Average Daily Requirement (ADR) of the regulator has exceeded the Average Daily Capacity (ADC) of the current Production Line (Lucas TVS). So, a new automated production line is added to meet the customer demand. By using different tools like grouping technology, rank order cluster algorithm, process flow analysis, quality matrix, Poka Yoke matrix, Failure Mode Effects Analysis (FMEA), QCO a new automated line is introduced which can accommodate all high demand products with reduced cycle time.

Tool used (Development tools - H/w, S/w): Grouping technology, rank order cluster algorithm, process flow analysis, FMEA, QCO. Software used are AutoCAD, Microsoft Excel, Microsoft PowerPoint.

Objectives of the project: 1) To introduce a new automated production line to meet the average daily requirement 2)To make a production line to accommodate all high demand

products with less complexity 3) To reduce the cycle time of the product, thereby increasing the capacity of the production line.

Major learning outcomes: 1) Learnt about automated and control technologies2) Got to know about automated production lines3) Learnt effectively to do process FMEA4) Learnt about lean manufacturing 5) How to reduce waste and cycle time.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Freedom to use the resources of the company. Provided the necessary data of the company without any hesitation and friendly higher officials. Mentor was available and did not hesitate to pick up my call even after shift timings. During this pandemic, company took care of my health and the employees, who are affected with Covid-19.

Academic courses relevant to the project: 1) Robotics and Automation Technologies2) Quality Control Assurance 3) Product Design.

Name: ARUN B(2019H1060510G)

Student write-up

Short summary of work done during PS-II: One of the purposes of this research work is to investigate vibration testing, and applied techniques in order to verify (and provide empirical proof) that the design will respond as specified under the customer requirements. While FMEA may show an assembly's modelled performance, it is necessary and required (by the customer) that test evidence be provided to verify the modelled assembly will perform as expected under real world conditions. The sine sweep vibration test is one portion of assembly performance verification under controlled conditions and is used for structural dynamics.

In the second part of the study, static analysis of the starter motor was carried out to find the reason for magnet breakage and to modify it based on the results while comparing with the benchmark product for verification.

In the third part of the study, static structural analysis of electrical bikes' rim which are coupled with electrical hub motor was investigated. Loading conditions were applied on rim in order to simulate driving forces that exert on road conditions to find out the change in air gap.

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

Objectives of the project: To carry out vibration sin sweep analysis of SM63 starter motor of 30G for 20 hours to check for safety. The structural analysis is performed considering the tightening on starter 2 and to be compared with benchmark starter 1 to find the reason for breakage. The objective was to carry out the structural analysis of 1.2Kw Hub motor fitted in 10 inch diameter wheels and to find out the change in air gap between stator and magnets in operating conditions.

Major learning outcomes: Learnt about linear and non-linear Finite element analysis using Ansys.

Details of papers/patents: No papere or patents were made.

Brief description of working environment, expectations from the company: Working environment was overall good experiance.

Academic courses relevant to the project: Finite element analysis, CADD, Theory of Vibrations, Theory of elasticity and plasticity were revelent for my project.

PS-II Station:MapmyIndia (CE Info Systems Pvt. Ltd.,), New Delhi

Faculty

Name: Prof. Ritu Arora

Student

Name: VINEET TIWARI(2019H1400141H)

Student write-up

Short summary of work done during PS-II: The project deals specifically with APIs and their integration with different programming languages. APIs and SDKs make it easier for the developers to incorporate any third party libraries. Programmer is saved from the hassle of creating an API herself. But even though creating an application is important, knowing the product from inside is important too. A developer must first understand the features and behavior of the application before starting development. For this, there is no better place than the testing lab where bugs and errors are reported in every software development life cycle.

Tool used (Development tools - H/w, S/w): S/w: Python, kivy 2.0.0, postman, PWA, Apache camel, HTML, CSS, JavaScript.

H/w: Hardware Head unit device for testing feasibility.

Objectives of the project: To understand the overall software development process of infotainment head unit system embedded in four vehicles. This project requires research work to understand the documentation required for development process and then test feasibility of important features in reputed vehicle company.

Major learning outcomes: HTML, CSS, BOOTSTRAP, JAVASCRIPT, REACTJS, NODEJS, EXPRESS, MERN STACK DEVELOPMENT and APACHE CAMEL.

Details of papers/patents: To understand the complete software development cycle, this project demands to first develop complete overview about how API's works and how to use it. So first by looking into different API's provided by MapmyIndia, a software is made for better understanding.

Brief description of working environment, expectations from the company: Working environment is too good. All are helping in nature. Complete work life balance is there. We can expect good challenging work.

Academic courses relevant to the project: ANN, Software for embedded system.

PS-II Station:MapMyIndia (Non-Tech), New Delhi

Faculty

Name: Prof. Arun Maity

Student

Name: PRUTHVIRAJ SINH RATHOD(2016B3A30211G)

Student write-up

Short summary of work done during PS-II: Business analyst role- We were tasked with building work flows and consultative solutions for Industry specific use-cases while keeping in mind the scope, the requirement and the extent of the usage by the clients. A great blend of technical and business knowledge was gained during the course of the PS2.

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

Objectives of the project: Client outreach and business development.

Major learning outcomes: Technical knowhow regarding App workflows, business development.

Details of papers/patents: NA

Brief Description of working environment, expectations from the company: It was a great working environment with the CEO & CSO being Bits Pilani Alumni, they were very supportive and encouraging of the work that we were engaged in and were constantly providing valuable feedback for the same.

Academic courses relevant to the project: SAPM, DRM, FOFA, Market research, BAV.

PS-II Station:Markets & Markets, Pune

Faculty

Name: Prof Ambatipudi Vamshidhar

Student

Name: RAJDEEP BASU(2019H1490838P)

Student write-up

Short summary of work done during PS-II: I worked in market research. End to end reports on different important markets for the composites industry under the chemical and material 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 and PowerPoint mostly.

Objectives of the project: Accurate market estimation for identifying key revenue generators for respective markets.

Major learning outcomes: Primary and secondary research, market estimation.

Details of papers/patents: Market estimation related to chemicals and composites market.

Brief description of working environment, expectations from the company: It was work from home. But culture is good, once you adjust and optimize your workflow it is fine.

Academic courses relevant to the project: Marketing Research, Quantitative Methods and Statistics.

Name: SAI KIRAN VADDI(2019H1490842P)

Student write-up

Short summary of work done during PS-II: I was involved in market research. My work mainly focused on primary and secondary research, preparing research reports on markets related to the electronics and semiconductor domain. At a technical level, I was able to explore the various facets associated with market research such as market segmentation, market estimation and forecasting. Being a Research Associate in the Electronics & Semiconductor domain, the PS experience has also provided ample opportunities to learn more about my domain. On a daily basis, I have been exposed to new technologies, knowing about new markets and technologies related to those markets has broadened my horizon not only in the technology sphere but also presented me with opportunities to learn about how companies are strengthening their position in the market.

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

Objectives of the project: To prepare market research reports with extensive quantitative and qualitative analysis of the market.

Major learning outcomes: Market segmentation, estimation and forecasting, knowledge about new technologies and growth strategies adopted by companies.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The environment of the company is very conducive for learning, at every stage peers and seniors guide us very well. Due to extensive focus on primary research, we got a chance to get in touch with various industry experts and talking to them would give us a practical insight about various recent developments related to the market. The company expects us to be self-reliant and willing to learn. The experience at the company not only provide us with opportunities and to learn about various markets but also helps us to dive deep about various technologies that are related to the market.

Academic courses relevant to the project: Marketing Research, Quantitative Methods and Statistics.

Name: A A NAVANEETHAKRISHNAN(2019H1490848P)

Student write-up

Short summary of work done during PS-II: I was working as a Market Research Associate.

Tool used (Development tools - H/w, S/w): Microsoft Office Tools (Excel, Word and PowerPoint).

Objectives of the project: Forecast the market volume and market value of various products in the aerospace and defence domain. The project also identifies various players catering the market and benchmarking them based on various parameters. The DROC of the market was also studied.

Major learning outcomes: The major learnings revolved around gaining knowledge on market analysis and data interpretation. It also involved developing methodologies to forecast considering various data points.

Details of papers/patents: Various reports were published under the aerospace and research domain. Due to the confidentiality, the names are not being mentioned.

Brief description of working environment, expectations from the company: The company has a refreshing atmosphere with the whole team guiding me in the early days. It generally offers a flexible working hours with the work often getting staggered during month ends.

Academic courses relevant to the project: Market Research, Analytics, Quantitative Methods

Name: ROSHINI MURALI KRISHNAN(2019H1490853P)

Student write-up

Short summary of work done during PS-II: As a research associate intern in the Information and Communications Technology domain, I had worked on latest technology market research projects. I had to develop strong understanding of technology markets. I had to segment the market into various sub-segments and identify market drivers, opportunities, challenges, the solution and services offerings, vendors and recent developments in the markets. The research findings had to be consolidated and a detailed report (more than 200 pages) based on the extensive research done had to be written.

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

Objectives of the project: To analyze latest trends in technology markets and conduct core market analysis.

Major learning outcomes: 1. Market research 2. Secondary research3. Analyzing annual reports.

Details of papers/patents: The projects involved conducting a market research of upcoming high technology markets related to digitalization and IoT. The focus of the research is on contemporary market trends and developments, and potential factors contributing to the growth of the company.

Brief description of working environment, expectations from the company: Throughout the PS, I worked from home through virtual PC. Each domain will have various sub-domains. Each sub-domain will have a manager and few team leads. Each newly joining person is assigned to one team lead.

Company expectations: Before joining the company, they expect the students have basic knowledge on market sizing and technical subjects related to the domain they will be joining. After joining the company, they expect on-time report delivery and maintenance of high quality deliverables.

Academic courses relevant to the project: The market research projects enabled me to practically apply various concepts, theories and frameworks such as SWOT, Porter's five force analysis and BCG Matrix that I have studied in my MBA courses, namely, Management Framework and Functions, Business Statistics.

Name: AKASH MANDLOI(2019H1490858P)

Student write-up

Short summary of work done during PS-II: I was responsible for doing primary and secondary research, and publish market estimation report.

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

Objectives of the project: Market estimation and forecast reports.

Major learning outcomes: Secondary research, business communication.

Details of papers/patents: Not applicable

Brief description of working environment, expectations from the company: Worked from home, team was good and collaborative, overall a good working environment.

Academic courses relevant to the project: Management Framework and Functions, Business Statistics.

PS-II Station:Marsview.AI, Bangalore

Faculty

Name: Prof. K venkatasubramanian

Student

Name: ROUNAK SHIVKUMAR ASHA BHALOTIY(2019H1490846P)

Student write-up

Short summary of work done during PS-II: The purpose of the internship was to apply marketing lessons learnt during theory classes into a live project and help achieve targets set by the firm for marketing and promotion along with learning how real time marketing works in companies. The major tasks which were carried out included database creation and funnel building, competitor analysis, devising marketing strategy, drafting Email campaigns, business analytics. The various promotions and marketing campaigns which were done has brought in

2185 number of traffic as on 19th May 2021. The major task during the initial months to prepare strategy, understand the industry, the landscape and the competitors was studied. Based on that marketing strategy of promotions through social media was devised.

Tool used (Development tools - H/w, S/w): Crunchbase, Bitly, Canvas, MS- excel, Product hunt, Google analytics.

Objectives of the project: The purpose of the internship was to apply marketing lessons learnt during theory classes into a live project and help achieve targets set by the firm for marketing and promotion along with learning how real time marketing works in companies.

Major learning outcomes: Developed digital marketing skills, got exposure to SEO activities, product management, team work.

Details of papers/patents: Not applicable

Brief description of working environment, expectations from the company: The pandemic made the internship go online, however there was no less learning. I was supported well by my mentors. The mentors were very strict and the work demanded kept me on toes for day long but helped me to improve everyday. I got a real time experience of working in a startup. Expectations were high from the day I joined and they were fulfilled too but it could have been better if would have been given more different roles rather than routine digital marketing work.

Academic courses relevant to the project: Product and brand management, Marketing research, Advertising and sales promotion.

PS-II Station:MathWorks India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Sonika Chandrakant Rathi

Student

Name: GARGI MILIND PATIL(2017A8PS0408G)

Student write-up

Short summary of work done during PS-II: The first project was “Annotating Calibration Attributes on Model Elements”. The project involved coding of unit tests in MATLAB framework, code generation in MATLAB and understanding targets in Simulink.

The second project was "Halide Implementation of Channel Synthesizer". This project involved coding the algorithm in Halide, implementing the mex file and testing it's accuracy and performance. Knowledge of C++ and Signal Processing was required.

Tool used (Development tools - H/w, S/w): MATLAB, Simulink, ETAS INCA, Visual Studio, Halide Libraries.

Objectives of the project: The aim of the first project was MATLAB unit testing for an AUTOSAR feature. The purpose of this project was to provide users ability to customise the ASAP2 file according to their calibration requirements. The purpose of the second project was to leverage the speed provided by Halide for Digital Signal Processing algorithms.

Major learning outcomes: Unit Testing, Test Components, Halide, Signal Processing Algorithms.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: MathWorks has a great working culture. The internship experience exceeded expectations. The EDG team provides flexibility in the projects one can undertake. The work thus aligns with one's interest and skills. The environment is extremely friendly, collaborative and engaging.

Academic courses relevant to the project: Digital Signal Processing.

PS-II Station:Maxwell Energy Systems Pvt. Ltd., (ION Energy), Mumbai

Faculty

Name: Prof. Manoj Subhash Kakade

Student

Name: HEMANTH S A S(2017AAPS0390H)

Student write-up

Short summary of work done during PS-II: Firmware development for integrating battery management system with a VCU and a charger for electric vehicle application. Interfacing all these systems with CAN on an application level firmware.

Tool used (Development tools - H/w, S/w): CAN protocol, MPLAB IDE, PCAN, ION-specific tools.

Objectives of the project: The Objective of the project was to enable communication between BMS and VCU; BMS and charger.

Major learning outcomes: Learnt about embedded firmware development, worked on BMS and its importance in EV applications, testing of code or an application in general, hardware and software dependency, MCU working, working efficiently as a team.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment was absolutely phenomenal, the team I worked with was very friendly and helpful and more than willing to help me without any blockers. They did give me challenging problems and tasks for me to work on. I was expected to solve bugs/ issues on my own as long as I could, and they did chime in when I could no longer do it. The company is helpful to employees. It expects the candidates to work hard and also does not have very strict office hours(atleast in WFH), so you can do your work at your convenience.

Academic courses relevant to the project: Embedded systems, FPGA, Digital Design, Computer Architecture, IoT.

PS-II Station:MBB Labs Pvt. Ltd., Bangalore

Faculty

Name: Prof. Pravin Yashwant Pawar

Student

Name: ISHAN NIGAM(2016B1A40858P)

Student write-up

Short summary of work done during PS-II: Develop features of an application for internal use to aid the passage of different stages of bank facilities availed by various entities and help calculating the risk associated.

Tool used (Development tools - H/w, S/w): Java, Spring Boot, Junit 4, Informatica, Oracle SQL developer, SVN.

Objectives of the project: Web App dev, unit testing, debugging, SQL and data warehousing.

Major learning outcomes: Debugging, web development, unit testing, data warehousing.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: A stress free environment with good amount of responsibilities given. I was expected to deliver but got help from every employee whenever required. The work life balance is good.

Academic courses relevant to the project: OOP, DSA.

PS-II Station:Mercedes Benz, Bangalore

Faculty

Name: Prof. Shashank Mohan Tiwari

Student

Name: DEVANSHU WAKHALE(2017A4PS0293G)

Student write-up

Short summary of work done during PS-II: Worked on couple of ongoing projects within the team. Primary project was “Representation of Wiring Harness on Abaqus”. Had to simulate the behaviour of a cable under different types of loads in Abaqus as a 1-dimensional FEA model using beam elements.

Tool used (Development tools - H/w, S/w): Got to work on Abaqus, Hypermesh, Hyperview, ANSA, MetaPost, NX Flexpipe and Python.

Objectives of the project: FEA solvers have become powerful and can run simulation on design with high complexity. However, such simulations are computationally expensive and time consuming. Additionally, there can only exist finite computational resources. To make the most of it, it would be efficient to reduce the complexity of design by representing bulky components with their simplified versions. This project aims to create a reduced 1-D model for a wiring harness cable using beam elements to be used as simplified model in larger assemblies, while capturing the material behaviour accurately.

Major learning outcomes: Learnt some industry leading software used by the CAE experts in the team. The amount of exposure I received while working with the team is invaluable. Got to learn some good professional ethics. This internship has helped me improve upon not only technical skills, but also my interpersonal skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: MBRDI is the perfect place if you love automobiles, and are interested in research that goes into making a brand a customer's preferred choice. The team treats you as an employee and a fellow team member, and not as some intern. The amount of freedom to explore whatever you want to is unmatched. The mentors and managers are supportive of your ideas and appreciate your work, even if it is not up to the mark. You will definitely like the positive environment in the office. Although, one might expect many physical testing labs to be present at a research facility, especially at one run by Mercedes, but that is not the case. Most of the work is done on high performance computers.

Academic courses relevant to the project: All core mechanical courses could be relevant, depends on the project. Other relevant topics could be: FEA, Fracture mechanics, product design, etc. Also, some programming knowledge could be useful.

Name: G SUNDAR(2017A4PS0383P)

Student write-up

Short summary of work done during PS-II: Development of in house CAE model of Fibre Reinforced Rubber tires for crash simulations. Tested the model on several load cases and performed experiments to validate results.

Tool used (Development tools - H/w, S/w): LS Dyna, ANSA, Animator A4.

Objectives of the project: Develop a robust and reliable wheel model for applications in low speed and high speed load cases.

Major learning outcomes: Core CAE concepts, working with commercial explicit solvers and High Performance Computing servers.

Details of papers/patents: None pursued at the time of writing

Brief description of working environment, expectations from the company: The company is the pinnacle of CAE and automobile research in India. The people are extremely knowledgeable, and helpful and excellent infrastructure is provided to interns. Extended training for all software tools was given and interns are pretty much treated like regular employees and given all corporate benefits.

Academic courses relevant to the project: Materials Science, Mechanics of Solids, Production Techniques, Machine Design and Drawing, CAD, Finite Element Method, Computer Programming.

Name: DAVE YUG SAMIRKUMAR(2017A4PS0404G)

Student write-up

Short summary of work done during PS-II: My work is to design, integrate and optimise a thermal cooling circuit for the powertrain model of an electric truck along with complete design of the truck. It's based on the principle of one dimensional simulation.

Tool used (Development tools - H/w, S/w): GT Suite, SIMULINK, MATLAB.

Objectives of the project: Design and optimization of a cooling circuit of an electric truck.

Major learning outcomes: In depth knowledge about electric vehicles, modelling complete truck in GT suite, designing Simulink models and optimization.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment at MBRDI is really good. The employees are welcoming and very much helpful. Though I was at the office for a short period it was a pleasant experience.

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

Name: VENUGOPAL RANGANATHAN(2017A4PS0495G)

Student write-up

Short summary of work done during PS-II: Wrote code to be applied to data generated from CFD simulations at organization. The objective was to extract useful information from large data that could be used to make useful inferences. This would reduce the time taken to sift through the large data and also save on the memory consumption in an already burdened cloud storage. The project was at the intersection of CFD and data sciences where methods, algorithms of data science were applied to gain insights into results generated from CFD simulations, effectively serving as means of post-processing of CFD data.

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

Objectives of the project: To develop means of post-processing of CFD data through application of data science.

Major learning outcomes: Learnt about application of data science in the field of CFD, also got feedback from supervisors on preparing presentations.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Very professional. Everybody is very helpful but also very busy. I was mostly left alone to work on my project but got help whenever needed. Company expects you to be punctual in meeting your deliverables. Great place to work/intern for somebody interested in research.

Academic courses relevant to the project: Fluid Dynamics and Thermodynamics.

Name: MANAS DIXIT(2017A4PS0689G)

Student write-up

Short summary of work done during PS-II: LS Dyna simulation for fracture analysis of femur bone using 3 point bending test and development of ML based high level muscle controller.

Tool used (Development tools - H/w, S/w): LS Dyna, Ansa, LS prepost, Python, Matlab, Animator.

Objectives of the project: Research for improvement of human body models.

Major learning outcomes: Exposure to essential level of Python and Matlab coding, FEA simulations and professional corporate life.

Details of papers/patents: NIL

Brief description of working environment, expectations from the company: Working environment was highly conducive for enhancement of individual productivity. Managers were very much approachable and helpful over the entire duration of my work. The friendly atmosphere created by the seniors helped a lot in developing a strong professional connection which eventually helped me in fulfillment of my targets. The project offered to me was quite exciting and offered great scope for learning.

Academic courses relevant to the project: CAD/CAM.

Name: BHAVSAR DHRUMIN NIMESHKUMAR(2019H1410082G)

Student write-up

Short summary of work done during PS-II: I worked on finite element analysis of fuel cell stacks. In first project, I have studied the effect of assembly load on the contact pressure between Gas diffusion layer and Bipolar plate of fuel cell stack. During this project, I learnt about GASKET material model, GDL meshing and convergence issues observed in non-linear structural analysis. In second project, I modelled seals used in fuel cell stack using Hyperelastic material model. I also worked on datamining task using vSignalyzer tool. Apart from this, I worked on 3D CAD model classification using convolution neural networks.

Tool used (Development tools - H/w, S/w): ANSA, ABAQUS Solver, HyperView, vSignalyzer, Python.

Objectives of the project: Study the effect of assembly load on contact pressure between GDL and Bipolar plate of fuel cell stack.

Major learning outcomes: I was able to understand and deal with convergence issues faced during non-linear analysis. I learnt and implemented two different material models available in ABAQUS. I also learnt the implementation and application of CNN for image classification.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment is very good. All teammates and manager guided very well for our assigned projects.

Academic courses relevant to the project: Finite Element Method, Theory of Elasticity and Plasticity, Strength of Materials.

Name: MAYANK PARASHER(2019H1410086H)

Student write-up

Short summary of work done during PS-II: I was involved in two projects. First project focused on developing an FE model where preload could be provided to the bolt in the form of Torque Angle inputs. I performed meshing in Hypermesh, and simulations based activities in Abaqus. The objective was to come up with FE model that ensures stability to the above mentioned loading case.

Second project covered automation. First phase involved, development of Python based script/GUI that would allow the transformation of raw test data obtained from experiments and convert it into usable text format for Abaqus transient simulations. Second phase involved development of a tool that could automate the process of report generation in Abaqus view, (i.e) convert the .odb results into .ppt format. I was involved in developing a Python based scripting that also involved some amount of plugin customisation to the Abaqus GUI.

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

Objectives of the project: 1) Development of torque angle based model to perform bolt preload cases 2) Develop tool to automate report generation and test data extraction.

Major learning outcomes: Abaqus standard, Python algorithm development.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is pretty relaxed. It gives the fresher their own space to explore things. The team is really encouraging.

Academic courses relevant to the project: Fea, Machine design, Theory of elasticity, Mathematics, Computing.

Name: K G V KALYAN SREENIVAS KUMAR(2019H1410564H)

Student write-up

Short summary of work done during PS-II: Topic:- Predicting local human thermal comfort inside the vehicle cabin using a human body model.

1. Used Python language to model the physics involved in the human body (like blood flow, conduction of heat inside the body, skin temperature, heat lost (convection, conduction, radiation) from different body parts are predicted).
2. Integrated the Python code to MATLAB SIMULINK so that it can be coupled with 1-D cabin model and perform co-simulation to predict thermal comfort index.

Tool used (Development tools - H/w, S/w): Python, MATLAB, SIMULINK, DYMOLA (1-D tool)

Objectives of the project: Predict the human comfort inside the vehicle cabin.

Major learning outcomes: 1D simulation, Human body modelling, Python coding, MATLAB Python interface, Problem solving, Corporate work culture.

Details of papers/patents: None

Brief description of working environment, expectations from the company: My mentor was always there for me to help with all the doubts I got. Company management is very good, they know how to take care of their employees. Knowing at least one programming language is boon.

Academic courses relevant to the project: Advanced Mathematics(Where I learnt MATLAB and C programming).

Name: VALLURU SAI LAKSHMI NRUSIMHA PRASANTH(2019H1410588P)

Student write-up

Short summary of work done during PS-II: Study of Aeroelastic behaviour of a cantilever plate. A Two way coupled FSI(Fluid Solid Interaction) problem is simulated using STARCCM+ tool. A simulation methodology for solving an FSI problem in STARCCM+ was established. The same can be used for several applications in future. The numerical results obtained are in good agreement with literature. A considerable amount of time was spent in understanding the underlying physics of the problem.

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

Objectives of the project: Development of a simulation methodology.

Major learning outcomes: Learnt STARCCM+ as a tool, Fundamentals of aeroelasticity.

Details of papers/patents: Nothing as such

Brief description of working environment, expectations from the company: Most of the work has been done from home. Spent a month in the organization, the environment was really good and all my colleagues are helpful and nice. The work culture of MBRDI encourages everyone to work independently and help each other if needed. My mentor as well as team leader guided me through out my stay there and my manager helped me during tricky situations. MBRDI expects students to learn initially in the internship and provides all the necessary tools and resources. Later, the management gives encouragement to take responsibility and execute task on our own.

Academic courses relevant to the project: CFD, FEM, Dynamics and vibrations, Theory of elasticity and plasticity, Aerodynamics.

Name: RANJITH PRAKASH(2019H1480591H)

Student write-up

Short summary of work done during PS-II: My project is about the battery thermal management using phase change materials. The initial stage involved collecting literature on PCM, battery cooling and then validation. Three application study was done. In each case PCM was found to be effective than base case or conventional methods. Star-ccm tool was used for the simulation. Finally, my task involved suitable suggestion on the topic to company and team leads.

Tool used (Development tools - H/w, S/w): Star-ccm+.

Objectives of the project: To compare the cooling effect of PCM in battery and battery electronics.

Major learning outcomes: I had the opportunity to understand about the company activities, products, projects. The learning was a great experience with supportive mentors and managers. I could learn new tools, subjects as a part of my project.

Details of papers/patents: The manuscript is in the write up stage and is aiming to publish in SAE International Journal.

Brief description of working environment, expectations from the company: The company is great in terms of learning new things and exploring our talents. Everyone in the team was motivating and friendly. They expect us to do our work and timely submission of works. We will be treated as regular employees rather than an intern by providing all facilities.

Academic courses relevant to the project: Fluid dynamics, CFD, Heat transfer.

Name: ZAFFAR IQUBAL(2019H1480592H)

Student write-up

Short summary of work done during PS-II: Learnt STARCCM+ software, worked on automation of simulation and parametric study of sunvisor.

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

Objectives of the project: Reduce the time by using automation in simulation and parametric study of sunvisor.

Major learning outcomes: Learnt STARCCM+ software, how to use and when to use.

Details of papers/patents: No

Brief description of working environment, expectations from the company: It was overall good experience.I explored so many things in the company not only the work but also the culture and working environment.

Academic courses relevant to the project: Fluid dynamics, Heat transfer.

Name: PASUPULETI GANADEEP(2019H1480595H)

Student write-up

Short summary of work done during PS-II: Predicting wheel aerodynamics of wheel in a wheelhouse using unsteady computational fluid dynamics and machine learning. STARCCM+ tool was used to run CFD simulations.

Tool used (Development tools - H/w, S/w): STARCCM+, OCTAVE.

Objectives of the project: The project involved mainly in understanding flow behaviour around the wheel and wheelhouse by using unsteady CFD simulations. This study also involves application of Machine learning algorithm.

Major learning outcomes: Understanding wheel aerodynamics and Machine learning concepts. Also post processing in Starccm+ tool.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is really good and there is lot of scope to learn new things.

Academic courses relevant to the project: CFD.

PS-II Station: Micron Technology India Operations, Hyderabad

Faculty

Name: Prof. Pawan Sharma

Student

Name: ARYAMICK SINGH(2017A3PS0389P)

Student write-up

Short summary of work done during PS-II: Modify the existing firmware path coverage script. A Python script already existed to carry out the firmware path coverage task. The internship objectives were to improve this existing path coverage script. Work focused on primarily two modifications-

1. A new path enumeration algorithm.
2. Implementation of two features to reduce the computational load of a given run.

Tool used (Development tools - H/w, S/w): Python, Verilog, Verdi and Cadence Virtuoso.

Objectives of the project: To improve the existing path coverage script.

Major learning outcomes: 1. Understanding of the NAND flash chip - Program, Read and Erase operations.
2. Understanding of the NAND flash firmware - its operation and the purpose it serves.
3. Hands on experience with scripting and development of in-house software tool.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Micron offers a great place to learn and hone your skills. The team members are very helpful. The mentors take keen interest in your work and organise regular sync-up meetings to help you with your project. The managers too are very friendly and supportive. Teams are close-knit and have a very high level of bonding. And, although the NAND flash industry is very fast paced and the deadlines can be very tight, but still you are given ample time to learn. Also, all the professional and personal requirements of the interns are duly taken care of by the company.

Academic courses relevant to the project: Computer Programming, Digital Design, Microprocessors Programming & Interfacing and Discrete Structures in Computer Science.

Name: YASHAS(2017AAPS0326H)

Student write-up

Short summary of work done during PS-II: To validate firmware developed to control eMMC and UFS protocol based memory devices developed by Micron, and to develop a test suite that is robust and complete, which ensures any gap during firmware development is addressed and any requirement changes are thoroughly discussed.

Tool used (Development tools - H/w, S/w): C++, Python, eMMC and UFS protocol, Micron proprietary hardware.

Objectives of the project: The project is a new eMMC based memory product being launched by Micron specifically to cater the automotive market. It is based on eMMC 5.1 spec and is going to be the frontrunner of eMMC based products out of Micron.

Major learning outcomes: Sharpened coding skills, learnt about various memory interface protocols in significant depth, exposure to real time industry environment with real life challenges.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is extremely good, with chances to learn every minute if one is proactive. The company treats their employees really well, and treated us interns on par with the full time employees. They expect performance but they do not believe in micro management. The company is growing exponentially and it is a great opportunity to work here.

Academic courses relevant to the project: Microprocessors and interfacing, C programming, OOPS, Computer architecture.

Name: CHIRAG VIJ(2019H1120045P)

Student write-up

Short summary of work done during PS-II: Validation of Authenta security features of the Micron products were done during the PS-II. The work done on each feature are as follows:-

1. Every device has it's own Unique Identification No. (UID), for which the calculation and validation coding was done.
2. Every device could get corrupted due to sudden power loss or any other reason. The code were written to identify if the given partition of the flash memory is corrupted or not.
3. Failure analysis and bug removal tasks were assigned to us to rectify the known errors of the already existing API's.
4. API was created to read the read-protected partition of the flash memory, without changing the read-protection attribute of the flash partition.
5. The entire work schedule gets updated on the Jira platform to track the work progress done by the team managers.

Tool used (Development tools - H/w, S/w): H/w - Metha Board, eMMC Sample.

S/w - EFA Tool, Visual Studio C++ Express Edition 2010.

Objectives of the project: Validation of Authenta security feature added to the Micron product.

Major learning outcomes: Understanding the flow regarding working of hardware from booting of firmware to the implementation of API's at the user end. Inculcating good programming practices. Understood the importance of documentation work of the tasks completed.

Details of papers/patents: We were given a Technical Requirement Documentation (TRD) on the basis of which all the development activity were implemented.

Brief description of working environment, expectations from the company: The working environment of the company was very professional and also the ambience was very good. The expectations of the company included understanding of the flow of how hardware works, its inner implementation of firmware and corresponding validation etc. and last but not the least timely delivery of the tasks assigned to us. So far, we're able to live up to the expectations of the company and hope for the same in the future.

Academic courses relevant to the project: Programming - C,C++, Software Testing Methods(STM), Object Oriented Analysis and Design(OOAD), Software Architecture(SA).

Name: MATHEW T GEORGE(2019H1230046H)

Student write-up

Short summary of work done during PS-II: Functional verification of SSD controller SoC's.

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

Objectives of the project: Write scripts and C based tests to perform functional verification of SSD controller SoC's. Debug design to identify failing cases and raise the issues to the respective design teams.

Major learning outcomes: Scripting for VLSI verification flow. Writing C tests for functional verification.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment onsite was excellent. The expectation from interns is quite reasonable and well within achievable territory.

Academic courses relevant to the project: Advanced VLSI architectures.

Name: NAMAN GUPTA(2019H1230071P)

Student write-up

Short summary of work done during PS-II: I worked on the reliability flow development which will check the basic functionality of the device and checks if everything is working fine in the flow and gives the required output. In this flow development, knowledge of C programming, C++ OOPs, Linux shell commands and software development is required. This flow is basically a Linux user level program. This flow calls the APIs (power on, get controller name, erase, read, write, get system info, etc.) from different classes and run them in the flow and then dumps the generated result/output in the log files. This project has really introduced me to a lot of new concepts in the software development domain. The experience received till now as part of this program has been overwhelming.

Tool used (Development tools - H/w, S/w): Linux Ubuntu, Linux Redhat, Mobaxterm, Filezilla, Git, Yocto project.

Objectives of the project: To develop reliability flow development using C/C++ programming language.

Major learning outcomes: Linux, Software programming, Embedded concepts.

Details of papers/patents: No

Brief description of working environment, expectations from the company: The working environment was great. In the time of corona, Micron provided opportunity to work from office and provided good accommodation.

Academic courses relevant to the project: VLSI architecture.

Name: PAITHANKAR DEVASHREE RANJEEV(2019H1240086P)

Student write-up

Short summary of work done during PS-II: My PS-II work was mainly on the development of quality planning tool that the team was working on. The basic skeleton of the web-app was already developed and I was required to carry forward that and add the required functionalities to the web-app.

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

Objectives of the project: Web-app development.

Major learning outcomes: Python flask, Python scripting, Quality tests done in the QRA team, version control system Git.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment was very friendly and supportive. The teammates were always there to help and proactive in making the new members comfortable in the team.

Academic courses relevant to the project: VLSI design.

Name: PARUL JYOTI(2019H1240093P)

Student write-up

Short summary of work done during PS-II: As I am part of Micron SQRA qual group, whose work is to run reliability tests on drives and analyse the SMART logs collected. During my PS-II tenure, I wrote Python scripts to automate the analysis work for different test flows and generate automated report. Apart from this, I was part of another project where I did manual analysis of logs and prepared reports which was used to check for any errors in drive behaviour.

Tool used (Development tools - H/w, S/w): VS code(for Python scripting), JMP.

Objectives of the project: To write Python scripts to automate QRA data analysis work in order to reduce time consumed in manual analysis of drive logs.

Major learning outcomes: Functioning of SQRA qual team, SSD architecture, SATA, PCIe interface, NAND flash basics, Python scripting, Use of JMP software, Root cause analysis of drive failures.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Great working environment and helping seniors/colleagues. Team members are easily approachable and they insist on clarifying doubts by asking them. I expect to learn more and more from the experienced team members and contribute to self as well as team's growth.

Academic courses relevant to the project: Network Programming, ANN for Python and coding point of view.

Name: VIKAS GUPTA(2019H1400541G)

Student write-up

Short summary of work done during PS-II: Firmware and library development for NAND flash memory.

Tool used (Development tools - H/w, S/w): C, Perl, Git, Visual studio.

Objectives of the project: Developing firmware and library for NAND flash.

Major learning outcomes: Firmware concepts, Embedded concepts.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Great work culture, friendly colleagues.

Academic courses relevant to the project: Embedded System Design, Real Time Operating Systems, Device Drivers.

Name: VIRENDRA SINGH CHAUHAN(2019H1400580P)

Student write-up

Short summary of work done during PS-II: During my PS, I worked on a live project which deals with the validation of key based security feature included in firmware, used in MNAND controller, which actually used for the authentication of the device and its security from the hackers.

Tool used (Development tools - H/w, S/w): 1. eMMC Device used in FPGA board(3rd party) to validate the firmware used inside eMMC device 2. Visual C++ software.

Objectives of the project: Objective of the project was to develop a firmware with an extra layer of security (Anthenta feature) and to validate that feature using the test code developed by validation team.

Major learning outcomes: 1. Learnt test code flow2. About the company work (it uses Agile methodology) 3. Designing of test code 4. Various ways of failure analysis and its debugging.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Expectation were high from our team leaders and manager since the project was lagging behind but anyhow that project is about to complete and our team is also satisfied with the work. Working environment is good. Everybody supports and helps if I am not able to understand but still deadline is the priority.

Academic courses relevant to the project: Basic requirement: 1. Basic C and C++ mandatory
2. GIT Knowledge
3. Architecture knowledge is needed.

Relevant courses: 1. Embedded System Design
2. Device Driver
3. VLSI Architecture.

Name: SUDHARSHAN K V(2019H1400581P)

Student write-up

Short summary of work done during PS-II: Platform development for SD/uSD devices using FPGA.

Tool used (Development tools - H/w, S/w): Hardware: Xilinx Zedboard, uSD/SD card
Software: VS code, Linux, Yocto.

Objectives of the project: The main objective of the project was to come up with a working prototype to validate SD/uSD devices.

Major learning outcomes: 1) Good understanding on the working of Linux
2) FPGA working
3) Yocto project
4) Knowledge on device trees in linux
5) Github, SVN and Jira tracker
6) Coding guidelines which is very much essential in professional environment.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: Micron Technology is a pioneer in DRAM, SSD and storage devices. I did my PS in the NVMQRQ department of Micron which qualifies client and enterprise SSD's. The working environment is very flexible. My peers and mentor were accommodative and always encouraged me to keep trying. At the same time the work is challenging. Mentors ask you to learn new tools and implement them in the project.

Academic courses relevant to the project: Device Drivers, Software for Embedded Systems.

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

Faculty

Name: Prof. Kranthi Kumar Palavalasa

Name: P SAI SREE RAM(2019H1230055G)

Student write-up

Short summary of work done during PS-II: Development of inductive sensor, Verilog design, validation and evaluation.

Tool used (Development tools - H/w, S/w): Cadence Xcelium, Simvision, Maestro view, Virtuoso.

Objectives of the project: An inductive sensor is a device that uses the principle of electromagnetic induction to detect or measure objects. An inductor develops a magnetic field when a current flows through it; alternatively, a current will flow through a circuit containing an

inductor when the magnetic field through it changes. This effect can be used to detect metallic objects that interact with a magnetic field. Non-metallic substances such as liquids or some kinds of dirt do not interact with the magnetic field, so an inductive sensor can operate in wet or dirty conditions. To develop optimized synthesizable Verilog code to design the digital part of the inductive sensor for the automobile industry to detect the object placement and orientation and also verifying its operation with vast test cases.

Major learning outcomes: The SENT protocol has been used to communicate with the sensor by the Electronic Control Unit(ECU).This project made me understand all the processes employed in the semiconductor industry.Inductive sensors comprise both analog and digital components thus making the project a mixed-signal project.Communication between analog and digital has been made with the Verilog AMS code.System Verilog has been used for the verification of digital parts of the project.Got a clear understanding of the Linux machine.Learnt system Verilog, AMS simulation setup. Understood the work culture of the industry, the process of design and verification of the digital parts in the semiconductor industry.

Details of papers/patents: None

Brief description of working environment, expectations from the company: I am satisfied with the experience I got from Microchip Technology during PS-II. The work culture is good. I had the opportunity to communicate with different team members from different domains to get clear idea of the work each domain does in semiconductor process.

Academic courses relevant to the project: Industry expects hardware engineer to know system Verilog and UVM, If we were given VLSI test and testability that would have been very much helpful.

Name: PONDURU MANOJ KUMAR(2019H1230526H)

Student write-up

Short summary of work done during PS-II: I studied the specifications of the memory block to be verified and based on that I made verification plan and test plan.I practised systemVerilog,UVM,SVN repository concepts and basic Linux commands.I also learnt how to use different verification tools like QuestaSim, Libero.

Tool used (Development tools - H/w, S/w): Mentor graphics questa sim, Visualizer, libero, Linux environment.

Objectives of the project: Verification of the memory block.

Major learning outcomes: SystemVerilog, UVM, QuestaSim tool.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Microchip has excellent working environment.Team is so helpful and cooperative which provides the motivation to work. Everything is well organised which makes the work smooth and easy. There is recognition for the hard work we have done. Provides good work life balance.

Academic courses relevant to the project: VLSI verification.

Name: JANGAM AKSHAY ANANT(2019H1230532H)

Student write-up

Short summary of work done during PS-II: Learnt about DFT profile and related tools, verified designs and developed tests for some blocks.

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

Objectives of the project: Design for testability.

Major learning outcomes: Good knowledge of profile and related tools, improved debugging skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Very good learning environment, very good team which helps you everywhere and motivates you to take up the responsibilities.

Academic courses relevant to the project: VLSI, OS.

Name: RAKESH KUMAR MOHANTY(2019H1400554H)

Student write-up

Short summary of work done during PS-II: I joined Microchip Technology as a firmware engineer intern. My work was primarily based on inductive position sensor ICs'. I was working in the software team of sensor apps team. The team was responsible for developing a software which can simulate and calibrate the ICs' by controlling various parameters. I designed some new features for the software. It was based on c++ OOPS concepts. I also worked on creating an additional software where we implemented TCP/IP protocol to capture data, process it and send back it to the user.

Tool used (Development tools - H/w, S/w): S/w- Qt, H/w- Lx3301 & Lx3302 evaluation boards

Objectives of the project: To add additional features in an existing software and creating an additional installer for the software package.

Major learning outcomes: Learnt about OOPS concept, how it's used in software development.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: The working environment was energetic. It was small team where I was working with a lot to learn. Learnt about time management and how to work under high pressure situations. I got to work on the existing software development. Team members were supportive and co-operative most of the time.

Academic courses relevant to the project: Embedded systems design, C++ OOPS concepts, Operating systems.

Name: DEVARAKONDA VENKATA SAI PRAKAS(2019H1400607H)

Student write-up

Short summary of work done during PS-II: Need to read many FPGA user guides, work on FPGA application designs. Need to learn and write TCL scripts, worked on system builder, learnt Questa for checking clocking issues. Need to work on SARs where you start learning new things related to FPGA and tools.

Tool used (Development tools - H/w, S/w): Libero SoC, Softconsole, MSS configurator.

Objectives of the project: Mainly to design applications related to FPGA, so that our customers can utilize them.

Major learning outcomes: Majorly learnt how to access or utilize different resources upon FPGA, build our application and also learnt few tools like Libero SoC, Softconsole, MSS configurator.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Company has good environment and everyone teammate of mine was very supportive and cooperative. They used to assign me a decent amount of work so that I can enhance my knowledge. To be recruited into the company needs basic knowledge of FPGA, VLSI, Embedded protocols, Device drivers.

Academic courses relevant to the project: Embedded systems design, Operating systems.

PS-II Station: Mindshire Consulting, Hyderabad

Faculty

Name: Prof. Y. V. K. Ravi Kumar

Student

Name: CHITTALURI KRISHNA SAHIT (2015B5A40528P)

Student write-up

Short summary of work done during PS-II: Building a web application using MERN stack and functional testing.

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

Objectives of the project: Building a web application.

Major learning outcomes: MERN stack development, nest.js framework, functional testing.

Details of papers/patents: None

Brief description of working environment, expectations from the company: As the company is start-up, there's few people working on it. So there's lot more responsibility and learning on your shoulders. As for the working environment, it was really good as we got to interact with the developers as well the mentors daily. The mentors were really nice and supportive of the work you do.

Academic courses relevant to the project: None

Name: BHUSHAN RAGHUVIR THUMSI(2017A4PS1167P)

Student write-up

Short summary of work done during PS-II: Worked using MERN stack to build working web application. Also used react native to begin developing a mobile application. Front end work mainly included using React to build a website for schools and institutes to manage subjects, classes, schedules, homework, etc.

Tool used (Development tools - H/w, S/w): MERN Stack, React Native.

Objectives of the project: To create functional web application and mobile application.

Major learning outcomes: Learnt end to end production of making web application.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: We had morning google meet call and would interact with each other throughout the day.

Academic courses relevant to the project: Computer Programming.

PS-II Station:Mocxa Health Pvt. Ltd., – Non-Tech, Bangalore

Faculty

Name: Prof. Kranthi Kumar Palavalasa

Student

Name: ADWAIT KULKARNI(2017A3PS0901G)

Student write-up

Short summary of work done during PS-II: Worked in a startup environment in General Operations vertical. Learnt a lot about startups and how a medical startup company navigates through the regulatory and commercial environment.

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

Objectives of the project: Company operations.

Major Learning Outcomes: Business Management/Startup, Operations Management/Strategy.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: My work was work from home due to the pandemic. The company expects you to be on a standup call everyday and track progress continuously as part of an agile working environment. The mentors can be contacted anytime through mail or whatsapp for any issues or doubts you may have.

Academic courses relevant to the project: Principles of Management.

PS-II Station:Morgan Stanley - Strats and Quant Role, Bangalore

Faculty

Name: Prof. Ambatipudi Vamsidhar

Student

Name: AYUSH VACHASPATI(2016B3A70398P)

Student write-up

Short summary of work done during PS-II: Worked in fixed income division to analyse cashflows and price data to find and analyse historical returns.

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

Objectives of the project: Create dashboard to analyse historical returns on securitized bonds.

Major learning outcomes: Learnt about financial engineering and analysis of the same.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Professional working environment. Great colleagues who help you learn a lot and are supportive throughout the internship.

Academic courses relevant to the project: DRM, Financial Engineering, DSA, DAA.

PS-II Station:Morgan Stanley Advantage Services, Mumbai

Faculty

Name: Prof. Chetana Anoop Gavankar

Student

Name: SARTHAK GOEL(2016B3A70394H)

Student write-up

Short summary of work done during PS-II: As part of the Credit Risk Model Performance analytics team, we used to set standards and monitor credit risk models for the assets in the banking book. Our job was to carry out statistical tests, set standards, generate regulatory reports and find out the major risk drivers behind credit risk models.

Tool used (Development tools - H/w, S/w): R, MATLAB, VBA for Excel.

Objectives of the project: Performance analytics for models.

Major learning outcomes: Credit Risk Analytics.

Details of papers/patents: No papers published or patents filed.

Brief description of working environment, expectations from the company: Extremely talented working peers, challenging work in some teams and excellent growth opportunities.

Academic courses relevant to the project: Probability and Statistics, Fundamentals of Finance and Accounting, Applied Econometrics.

Name: SOURADEEP CHAKRABORTY(2017A3PS0170G)

Student write-up

Short summary of work done during PS-II: Morgan Stanley risk managers decided to migrate from 4 year calibration period based reporting to 1 year based risk reporting standard following the latest BASEL III guidelines. This transition, coupled with the COVID-19 pandemic's effect on the financial markets, gave rise to multitude of challenges like identification of processes that require automation and enhancement in quality, most importantly optimization of the underlying models to be more robust towards outlier shocks like the one generated during the pandemic. I was part of this project responsible for analyzing and implementing new risk model methodologies, automating existing reporting, load sharing over daily risk analysis and modeling tasks throughout the transition.

Tool used (Development tools - H/w, S/w): RiskFactor Engine, kdb+/Q, Python, R, STATA, MS Office.

Objectives of the project: Corporate Credit Risk Model Optimization.

Major learning outcomes: - Risk models: This was my first experience in the field of quantitative risk management and I learnt great deal about different kinds of risk management methodologies.

- Programming for finance: Languages like kdb+/q and STATA apart from Python and R were used which are becoming widely used in the financial industry.
- Corporate culture: Being one of the top investment Banks of the world, Morgan Stanley gave ample opportunities to interact with several international stakeholders from different parts of the organization and even learnt often ignored details like what sets apart a good mail from a great one in a professional environment.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Morgan Stanley gives a unique blend of independent learning and deliverable-oriented culture where

everyone is given sufficient freedom to explore, learn and contribute way beyond their structured project plan. The timings are friendly (most teams log in after 12PM) and even in a virtual environment, the onboarding was seamless. Culture wise team members, managers, senior team leads are all approachable, and occasional international events give many opportunities to interact with other employees.

Academic courses relevant to the project: Finance/Eco: DRM, FinMan, SAPM

Maths: P&S, MATH 1,2,3

CS: ML, NNFL, CP

Name: VAISHNAVI KOTTURU(2017A7PS0088P)

Student write-up

Short summary of work done during PS-II: Main project was to develop a prototype in Python for PIT backtesting. I also worked with 3 other automation projects along side.

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

Objectives of the project: To develop a statistical model in Python.

Major learning outcomes: Python, Excel, Statistical analysis, Backtesting.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Slightly flexible working hours in a remote setup.

Academic courses relevant to the project: Probability & Statistics, Derivatives & Risk Management.

PS-II Station:MSCI, Mumbai

Faculty

Name: Prof. Krishnamurthy Bindumadhavan

Student

Name: BHAVESH KUMAR TEKWANI(2017A3PS0338P)

Student write-up

Short summary of work done during PS-II: Used MSCI's Flagship risk management products namely:-

1)Barra®One

A multi-asset class, multi-currency risk and performance analytics platform that enables investors to use its risk forecasting model, correlated stress test engine and performance analytics together in an integrated fashion.

2)RiskMetrics® RiskManager

A multi-asset class, scalable SaaS framework for enterprise-wide risk management. RiskManager's powerful analytical capabilities enable clients to quickly set up custom reports, run ad hoc analyses, perform exception management, design stress test scenarios and conduct what-if analysis.

To identify and analyse risk profiles of various portfolios as per clients' requirements.

Tool used (Development tools - H/w, S/w): RiskManager, BarraOne, MsExcel.

Objectives of the project: To provide risk assessment reports to a diverse clientele.

Major learning outcomes: I learnt a lot during my internship. The learning were not only related to type of work we do i.e. about equipment finance, but also about many life lessons. I was able to understand the nuances of leasing and lending decisions. Exposure to corporate life

have made me more organized and goal oriented. I am now more confident while interacting with new people and giving a presentation in front of an audience.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: MSCI pays special attention towards fostering a better working environment for the employees so that they can work without facing any issues. The working environment is encouraging and provides enough freedom to the employees to work flexibly. All are very supporting and ready to help you whenever needed. I was provided with all the tools which were necessary to do my tasks and regular feedback was taken by mentors about our day to day activities. The firm was very supportive to the employees during the lock-down. It organized many programs to ensure the well-being of employee's mental as well as physical health.

Academic courses relevant to the project: Derivates and Risk Management, Security Analysis and Portfolio Management, Financial Risk Analysis and Management.

Name: GAHLOT HARSHIT SURENDRA (2017A4PS0912G)

Student write-up

Short summary of work done during PS-II: Index research projects - Understanding & implementing various index methodologies. To create various types of indexes & run their simulations on historical period. Analyzing & debugging various simulation failures. There are various small projects or client requests to be handled on a daily basis. Work on various data science projects which requires knowledge of Python or any other programming language.

Tool used (Development tools - H/w, S/w): Microsoft Office, MATLAB, SQL, Jupyter Notebook, Notepad ++.

Objectives of the project: To understand about various index methodologies, to implement them & also work on their enhancement.

Major learning outcomes: Got very good experience of working in the financial corporate sector, how to deal with clients. Also improved my knowledge of Python & SQL while working on various projects.

Details of papers/patents: None

Brief description of working environment, expectations from the company: MSCI has a very healthy working environment. All seniors are cooperative & helpful. I learnt a lot from my team members during my internship. On some days, the working hours can be extended till late nights due to work load. But overall, the environment is very friendly & encouraging.

Academic courses relevant to the project: DRM, BAV.

PS-II Station:MTAB Engineers Pvt. Ltd., Chennai

Faculty

Name: Prof. Glynn John

Student

Name: GIRISH G M N(2019H1410083G)

Student write-up

Short summary of work done during PS-II: I have been assigned to project which requires an alternative measurement system for testing pose performance characteristics of articulated industrial robots using ISO 9283.

1)Carried out extensive study on ISO 9283 test standards 2)Compiled available measurement solutions using sensors based on test setups 3)Design of fixture: Robot end-effector and Artifact 4)After doing extensive literature survey and discussions with guide was able to identify suitable sensors required for robot accuracy test measurements.

Tool used (Development tools - H/w, S/w): NX and Autocad Inventor software, MS Excel.

Objectives of the project: To replace already available laser measurement system with simple and less costlier measurement system for testing industrial robots according to ISO 9283 using suitable sensors and data acquisitions system(DAQ). Tests have to be done on industrial articulated robots with varying payloads such as 6kg and 10kg.

Major learning outcomes: Learnt NX, Autocad inventor design software and how companies modify the design parameters according to manufacturing feasibility. Selected a good measurement setup for testing robots by comparing various methods available. Identified the suitable sensors and DAQ for my project after had discussion with my guide and also contacted many companies regrading the same, there by initiated purchase through company.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is really good and company staffs are also helpful specially my mentor.

Academic courses relevant to the project: Mechanisms and Robotics, Product Design and Development.

PS-II Station:My Smart Price – Non-Tech, Hyderabad

Faculty

Name: Prof. Anjani Srikanth Koka

Student

Name: SIDDHANTH DWIVEDI(2016B3A40315P)

Student write-up

Short summary of work done during PS-II: Brightchamps Technology Pvt. Ltd., a subsidiary of Smart Price is a very early stage ed-tech startup started in May, 2020. Everything was in the initial set up phase when I joined. My work at BrightChamps was not in the form of single project but was divided into many small project areas across operations, logistics, sales, human resource, growth and product. In short, I got the experience of working in many cross functional teams and learnt about most of the aspects of setting up all the processes and workflows in an early stage startup. I worked on few growth and customer engagement projects, diversification of the product offering, automation of the workflows within the company using Zoho One applications, data cleaning, analysis using Excel and handling sales department for brief period.

Tool used (Development tools - H/w, S/w): Complete Zoho One Package: Zoho CRM, Zoho People, Zoho Books, Zoho Payroll, Zoho Recruit, Zoho Sign, MS Excel.

Objectives of the project: There was not one single project, the objective of the entire work during PS-2 was to deal with the challenges and undertake the work which is required by the company, automation of as many workflows as possible. The ultimate aim was to improve accuracy, reduce man hours and cut down the cost wherever possible.

Major learning outcomes: The overall experience of PS-2 provided me with a deep understanding on how early stage startups operate, the challenges that come in the way and the ways to overcome those challenges. I also got a detailed understanding of all the Zoho applications for streamlining and automating the internal operations of the company. I also spent fair time on data analysis using Excel and learnt about plethora of work that could be done using Excel.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The biggest advantage of working for an early stage startup such as BrightChamps is that there is no fixed domain in which you are expected to work. There were a lot of cross functional opportunities assigned to me. I got to work across all the major domains like growth, product, operations, logistics and HR. It's a good place to work if you are looking to explore different domains of functions. There were no fixed timings and everything depends on the nature of work.

Academic courses relevant to the project: Principle of Management, International Business, Market Research.

PS-II Station:National Council for Cement and Building Materials (NCCBM), Ballabgarh

Faculty

Name: Prof. Mahesh Kumar Hamirwasia

Student

Name: MANJUNATH PAGADALA(2017A2PS0711H)

Student write-up

Short summary of work done during PS-II: A systematic literature review was carried out on the reliability of corrosion monitoring techniques by conducting comparative analysis of the results of prior studies to accomplish the project's objective.

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

Objectives of the project: The project's first objective is to perform a literature study to recommend a suitable work setting for efficient working of widely used corrosion monitoring techniques: Linear polarization resistance (LPR), Electrochemical Impedance Spectroscopy (EIS), Galvanostatic Pulse Technique (GPT), and Half-cell Potential (HCP). The second objective is to showcase the dependence of corrosion measurements on rate influencers (General & Instrument specific) and suggest preventive measures to delay corrosion.

Major learning outcomes: Working on this project showed me the importance of conducting a literature study. It gives other researchers and us the information required to quickly understand the currently used techniques and find research gaps in the existing research. It also gave me the experience to continuously browse through research papers, which I feel is essential for someone aiming to become a future researcher.

Details of papers/patents: Final draft is prepared and will be sent to journal in the near future.

Brief description of working environment, expectations from the company: As the entire PS was online, I cannot say much about the NCCBM campus environment, but as far as I have experienced, the company is very professional. We ourselves need to be forward in enquiring about projects and any other things. No one is going to push you to do work. So be enthusiastic and ask them if you need anything. The mentors were very helpful in giving positive feedback to improve our projects. So, overall if you have the incentive to work, you can comfortably finish the work within the PS timeframe.

Academic courses relevant to the project: Soil Mechanics and Construction Management.

Name: CHANDRA PRAKASH JOSHI(2017A2PS0910P)

Student write-up

Short summary of work done during PS-II: Developed a systematic procedure to design concrete mix for 3D printing setup, modified design mix from established results, case studies and predictions.

Tool used (Development tools - H/w, S/w): MS Office & Octave.

Objectives of the project: Designing concrete mix for 3D printing setup.

Major learning outcomes: Material Science, Proportion Designing, Empirical Analysis, Work Reporting.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Research facility and helpful mentors.

Academic courses relevant to the project: Soil Mechanics

PS-II Station:CSIR-National Institute of Science, Technology and Development Studies (NISTADS), New Delhi

Faculty

Name: Prof. Shree Prasad M

Student

Name: ROHIT GOYAL(2016A8PS0359G)

Student write-up

Short summary of work done during PS-II: Worked on making a suitable report on "The effectiveness and assessment of policy strategies towards India's solar and wind energy missions" and publishing it in a good journal at the end of the PS2. Worked on solar and wind energy history, distribution graph, potential, policies of government, pollution due to energy sector, cost, technical advancement, India's achievements and current projects towards renewable sector and comparison of Indian technology with global technology in renewable sector.

Tool used (Development tools - H/w, S/w): MiniTab, Microsoft Word, Microsoft ppt.

Objectives of the project: The effectiveness and assessment of policy strategies towards India's solar and wind energy missions.

Major learning outcomes: Learnt about how solar and wind can bring revolution in the field of energy consumption and generation in next decade and how we will be affected by it.

Details of papers/patents: None

Brief description of working environment, expectations from the company: It was a WFH PS session because of covid pandemic. I was in touch with my allotted NISTADS faculty twice per week and worked upto expectations. The expectations of NISTADS is that I will be able to provide a decent work at the end of PS2 which can be published in good journal.

Academic courses relevant to the project: My DEL course (Wind energy system) and other electrical related core courses helped me.

PS-II Station:National Instruments Systems (India) Pvt. Ltd., Bangalore

Faculty

Name: Prof. Rekha A

Student

Name: RAJAT DADHICH(2019H1240540H)

Student write-up

Short summary of work done during PS-II: I was the part of calibration team at NI Bangalore. My role was to study about the ongoing project which is the Phase Characterization of Vector Signal Analyzer. It started with getting knowledge about the Comb Generator because this hardware is new to the team and being used for the completion of project. I also studied about Vector Signal Analyzer, Vector Network Analyzer. Post mid-sem, I learnt about VNA calibration techniques and implemented the algorithm in Labview.

Tool used (Development tools - H/w, S/w): Vector Signal Analyzer, Vector Network Analyzer, Comb Generator, Labview.

Objectives of the project: To characterize the phase response of Vector Signal Analyzer.

Major learning outcomes: Learnt about hardwares like Vector Signal Analyzer, Vector Network Analyzer, Comb Generator and about various VNA calibration techniques.

Details of papers/patents: None

Brief description of working environment, expectations from the company: As it is WFH, I am not sure about the actual work environment. May be this online mode is going to be seen as new work environment for the companies.

Academic courses relevant to the project: RF Microwave Engineering.

PS-II Station:NBC Bearings, Jaipur

Faculty

Name: Prof. Nithin Tom Mathew

Student

Name: PRASOON KUMAR(2019H1410547G)

Student write-up

Short summary of work done during PS-II: The project was based on CFD based simulation in order to optimize cage stability at very high rotational speed of bearing. Drag force analysis over bearing cage pocket & roller has been done to compare the behaviour of cage in different submerged condition of bearing lubrication. This has been achieved by using multiphase modelling using VOF method.

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

Objectives of the project: Optimization of drag force under sub-murged condition of bearing lubrication.

Major learning outcomes: Product development processes using CAE techniques.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was WFH during entire duration of PS. I was supposed to report my daily outcomes to the team leader. I got lot of support & motivation during entire duration of PS from organization. There only drawback was that I couldn't visit organization due to pandemic & I have to work with very limited resources (like my own laptop, didn't got any license for software).

Academic courses relevant to the project: COMPUTATIONAL FLUID DYNAMICS.

PS-II Station:NetApp, Bangalore

Faculty

Name: Prof. Mohammad Saleem Bagewadi

Student

Name: ROJAN SUDEV(2019H1030008H)

Student write-up

Short summary of work done during PS-II: Explored, understood the architecture and working of Snapcenter, a software for backup management by Netapp. Implemented a feature related to disk resize and resolved bugs related to host management in Snapcenter and in that process learnt about C#, ASP.NET MVC, WCF, LINQ and SAN protocols. Configured NVMeoF setup on the ONTAP storage system and accessed the storage from Linux client.

Tool used (Development tools - H/w, S/w): S/w: Visual Studio, Git, ASP.NET MVC, C#, Snapcenter.

H/w: Netapp Ontap Storage Systems.

Objectives of the project: Understand the architecture of Netapp's Snapcenter software which provides application consistent data protection for databases, applications, VMs, host file systems, resolving bugs and implementing features related to Snapcenter.

Major learning outcomes: Learnt the architecture and working of Snapcenter, C#, ASP.NET, MVC, WCF, LINQ and SAN protocols by implementing a feature related to disk resize and resolving bugs related to host management in Snapcenter. Learnt about NVMeoF SAN protocol for accessing SSD storage over network and also built NVMeoF setup on the ONTAP storage system accessing the storage from a Linux client.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment was very supportive and people were always ready to help. A lot of measures were taken by company to tackle the overburden due to WFH during pandemic like company shutdowns, wellness holidays, covid leaves etc. Expectation from the company included understanding their backup management software, its core components, working on bugs and features related to it. I was really privileged to work with such organization that cares for the employee.

Academic courses relevant to the project: Distributed Database, Operating System.

Name: DEVARAKONDA MOHIT VARSHA(2019H1030026G)

Student write-up

Short summary of work done during PS-II: Initially started with learning about fundamentals, that included Data ONTAP, File System Fundamentals, Write Anywhere File Layout (WAFL) file system, RAID, etc... Next involved in a project, that deals with Compliance Management and Data Retention which uses NetApp's SnapLock, a part Data ONTAP operating system. It is a high-performance compliance solution with main objective of data retention. The project is team based project, which had two main aspects, extending retention times for files and snapshots. My work mostly is around the later aspect of retention times for Snapshots. Along with the project, I solved bugs, few of them related to the area of the project and few of them in other domains as well.

Tool used (Development tools - H/w, S/w): The project requires coding at Kernel level in NetApp's Data ONTAP operating system.

Programming Languages used: C, C++ for core, Python, Perl for testing purposes.

Version Control: Perforce.

Simulators: VSIM for actual hardware simulation, reporting bug.

Objectives of the project: Retention times set by SnapLock are currently limited till 2071 and beyond that data retention is not supported. The main objective is to extend the retention times far beyond the year 2071.

Major learning outcomes: Learnt about NetApp's Data ONTAP Operating System, Compliance Management and Data Retention.

Details of papers/patents: Since the project is about extending an existing functionality, there are no new papers or patents being published.

Brief description of working environment, expectations from the company: Due to current COVID situation, the internship has been WFH mode. Despite the WFH scenario, the team was enthusiastic and motivating. In the course of six month internship, the main expectation is to add value by improving an existing product which is must for the product to remain competitive and meet customer needs.

Academic courses relevant to the project: Advanced Operating Systems.

Name: BHUMIKA JOSHI(2019H1030501G)

Student write-up

Short summary of work done during PS-II: SnapCenter is a data management and protection tool that provides faster and frequent application crash consistent backups, faster restores and recovery, support for physical and virtual servers, policy-driven backup and recovery, use case of being easy to manage. I worked on SnapCenter Plug-in for Oracle (SCO) and SnapCenter Plug-in for Unix (SCU). Developed a microservice in Spring Boot framework for discovering the available oracle databases, along with the volume details on which they are present. SC server discovers them, then I created a microservice for it to be able to support cloud and tested it on PostMan. Created a Docker image for this microservice and deployed it on Kubernetes cluster.

Wrote UTs for SCU for covering the code for new features added in next release. Increased the coverage, worked on Security issue for Apache Maven jars: Wrote a shell script for getting the jars from the plug-ins installed on AIX or Linux host along with their SHA1 checksums.

Wrote a Python script to scrap Maven repository to get the actual checksums of the corresponding jars, Compared them. This all is automated.

Worked on upgrading Java version for SnapCenter.

Tool used (Development tools - H/w, S/w): Eclipse, VMware Horizon Client, Visual Studio 2012, Git, VS Code, SpringBoot Framework, Docker, Kubernetes, Perl, Linux and AIX hosts, C#

Objectives of the project: To performs tasks related to SCO and SCU to provide application-consistent data protection centralized web-based GUI, providing a single-pane-of-glass to the customers to monitor and manage backup, restore, and clone operations for Oracle databases on Linux and AIX hosts on NetApp storage, across the Data Fabric. This will help to accelerate application and database development, preserve data integrity, and simplify management of traditional complex backup and restore processes.

Major learning outcomes: Got experience of using new tech stack.

Learning about various new things like Oracle on LVM and non-LVM SAN layouts and Luns, volume groups, logical volumes and created them as well on volumes on ONTAP cluster, performed unit test, debugging and refactoring legacy code based on new feature release requirements, understood product evolving process according to customer requirements in a better way, better about working in a big team and collaborating with teammates for different purposes and learnt from them.

Details of papers/patents: NIL

Brief description of working environment, expectations from the company: WFH throughout the internship, team follows Agile Scrum methodology. Working environment is good and people are very helpful and considerate, so was able to do work efficiently from home. Company provided various benefits like no meetings on second Fridays of each month so as to concentrate more on work instead of lot of meetings and reimbursements for purchases made for increasing efficiency during WFH. Expect company to keep innovating and keep growing.

Academic courses relevant to the project: Advanced Data Mining, Advanced Algorithms and Complexity, Software Architectures.

Name: RATTI SAI PAVAN(2019H1030505G)

Student write-up

Short summary of work done during PS-II: NetApp being a data storage and management company has its own operating system as well as a proprietary file system called WAFL(Write Any Where File Layout).As an intern, I started working on WAFL team which works on core file system. The main aim of the project is to improve the write performance of the ops that will be coming from the client. There are so many ops mainly read, write and meta ops(create, update etc),even though most of the ops are optimized for improved write performance there are still some ops for which this optimization need to be done. The aim of this project is to improve the write performance of a meta op which are different from normal ops as they don't have any user data to be written to the disk.

Tool used (Development tools - H/w, S/w): My work in Netapp was majorly in kernel which is written in C programming language and also perforce in order to maintain version control and also Vsims(virtual simulator) to run as well as test the code.

Objectives of the project: The main objective of the project is to improve the write performance in WAFL filesystem.

Major learning outcomes: Understood NetApp's proprietary file system (WAFL-Write Anywhere File Layout) and also about ONTAP operating system.

Details of papers/patents: The work done has improved the performance of existing feature but it doesn't involve creating new features due to which there is no patent.

Brief description of working environment, expectations from the company: Due to pandemic, the internship was done in WFH mode and the main aim of the six months internship

in terms of expectation is add value or feature or solve existing problem within the NetApps file system.

Academic courses relevant to the project: Operating Systems.

Name: SANDEEP LOCHARLA(2019H1240131H)

Student write-up

Short summary of work done during PS-II: Worked in virtualization team at NetApp. I've worked on Scaleout VASA for VMware and am currently part of project Astra. Worked on bug-fixes, unit testing using Java, springboot and powermock as a part of Scaleout VASA project and also involved in few POCs (proof of concepts) to better understand the technologies available in implementing the product effectively. Currently, as part of project Astra, working on operator for VASA using Golang, operator SDK and VMware vSphere.

Tool used (Development tools - H/w, S/w): Java, springboot, mockito, powermock, kubernetes, docker, VMware vSphere, golang, gokit, operator-SDK, ONTAP storage.

Objectives of the project: To enhance the customers feasibility to scale-out their architecture when their need arises instead of acquiring new equipment or borrowing hardware necessary.

Major learning outcomes: Learnt a lot of new technologies, understood how a project is built from scratch keeping in mind the customer's current and future requirements. Learnt to work as a team and the value of peer support.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: WFH throughout the period of internship. Usually, meetings were conducted online to talk on everyday updates and see if anyone's blocked with any issues. When stuck, people were

supportive in offering their help irrespective of the team or product they are working on. The main expectations from the company were that, one should be savvy enough to learn and build new things, people were always eager to hear any opinions or concerns, so they expect anyone to think and speak out their minds.

Academic courses relevant to the project: Distributed Systems, Cloud Computing, Computer Networks/Communication Networks.

PS-II Station:Niyo Solutions Non-Tech, Bangalore

Faculty

Name: Prof. Sandeep Kayastha

Student

Name: MEGHA PALIWAL(2016B2A30927P)

Student write-up

Short summary of work done during PS-II: Developed SQL queries and dashboards for the Niyo Bharat product team. Strategized and implemented campaigns and journeys on CleverTap that involved the use of Push notifications, In-App Inbox, SMS and WhatsApp to increase the number of transactions (Money transfer & Recharges). Set up dynamic links using Google Campaign Builder and Firebase to track UTM performance. Complete product breakdown to find scope of improvement that lead to UI/UX changes. Updated board decks and conducted user interviews as side activities

Tool used (Development tools - H/w, S/w): Amazon Redshift (Metabase), CleverTap, Google Campaign Builder, Firebase, Microsoft Excel.

Objectives of the project: 1. Development of Metrics Dashboard 2. Development and implementation of communication based growth strategies for money transfer and recharge features of Niyo Bharat App.

Major learning outcomes: 1. Development of SQL queries 2. Data visualization techniques 3. Data presentation 4. UI/UX enhancements 5. Role of communication in adoption and retention of a product.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Fast paced working environment with a lot of ownership, high impact projects. The projects were both collaborative and individualistic in nature. There wasn't any interaction outside of work meets.

Academic courses relevant to the project: Market research, Derivatives and risk management.

Name: SHREYASH SAWANT(2017A1PS0294G)

Student write-up

Short summary of work done during PS-II: Mainly tried to increase customer retention for Bharat App with major success along with data analysis and drafting a user personal for domestic stocks.

Tool used (Development tools - H/w, S/w): PowerPoint, spreadsheet, metabase, clevertap.

Objectives of the project: To capture wallet share of the user and increase M3 retention.

Major learning outcomes: Inside working knowledge of company, communication skills, researching and analysis of data, product designing and managing it.

Details of papers/patents: No publications.

Brief description of working environment, expectations from the company: Everyone was on time for meetings, extremely helpful and respected every other employee, even if being an intern you can talk to anyone, learn from anyone.

Academic courses relevant to the project: Market research, Derivatives and risk management.

Name: DRISHTANT RAGHAV(2017A2PS0094P)

Student write-up

Short summary of work done during PS-II: I conducted the user research to improve the M-3 Retention of Niyo Bharat Users. It involved gathering data by interacting with users, refining data, presenting data and then checking the impact of our suggestions. Work also involved dashboard building in metabase and clevertap for various features.

Tool used (Development tools - H/w, S/w): Recording Device, Metabase.

Objectives of the project: To improve the M-3 retention of users.

Major learning outcomes: Interacting and interviewing people, SQL for data gathering and generating insights.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Company gives you ample time to learn and catchup with the workings of the company. There are no hard deadlines and you can ask for help at anytime. Everybody is eager to help but there is not much interaction apart from work with the co workers.

Academic courses relevant to the project: Market research, Derivatives and risk management.

Name: KRITHIK GARG(2017A3PS0609H)

Student write-up

Short summary of work done during PS-II: The business analytics project/work allotted consists of writing complex SQL queries for segregation of customer data into various categories according to the customer quality, age, occupation, income, kyc status and many more in various fields such as customer onboarding, investments, fund transfer, customer support. These types of queries extract results from the database and present them to various stakeholders and product managers. These provide insight on customer behaviour and help the company improve customer satisfaction and customer relationship.

Tool used (Development tools - H/w, S/w): SQL, Complex SQL Queries, Metabase.

Objectives of the project: Work of a business analyst include analysis of data from database using SQL and provide insights into various stakeholders and product managers in the graphical form.

Major learning outcomes: Learnt complex SQL querying, Data visualization.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was very thrilling experience. Everyone was very supportive and always available to help with various obstacles and clarify doubts. The mentorship received from this company is unmatched.

Academic courses relevant to the project: Statistics and Mathematics, Basic Programming.

PS-II Station:Nomura - Change Management Team, Mumbai

Faculty

Name: Prof. Ambatipudi Vamsidhar

Student

Name: SAURABH TIWARI(2016B3A70352G)

Student write-up

Short summary of work done during PS-II: I worked on automating manual tasks in the CAO office and created financials for this year's budget. Along with that also worked as a part of the project management team for integrating all compliance portals on to a single vendor platform.

Tool used (Development tools - H/w, S/w): Alteryx, PowerBI, SharePoint and Confluence.

Objectives of the project: To transform and automate the manual processes in the CAO office and integrate single portal for compliance teams.

Major learning outcomes: Stakeholder management, time management, work-life balance, alteryx, sharepoint, powerbi and confluence.

Details of papers/patents: No patents

Brief description of working environment, expectations from the company: Very good culture and working environment, the senior management and team members are helpful.

Academic courses relevant to the project: BAV, FuFa, Finman and SAPM.

Name: HARSHIT SHRIVASTAVA(2017A2PS0085P)

Student write-up

Short summary of work done during PS-II: My job role was of BA/PM within the firm, it was more of management role with an exciting and challenging work. I worked on 4 different projects during the internship in which helped company with cost optimization and BAU process. Digital tools like PowerBI and SharePoint designer were an integral part of my work, my job role involved lot of communication with the senior stakeholders as the team mostly acts as a bridge between them and the business people.

Tool used (Development tools - H/w, S/w): PowerBI, SharePoint Designer, Nomura Internal.

Objectives of the project: Cancel and Amends – Root cause identification, benefit and budget tracking, approval process for business changes.

Major learning outcomes: Digital tools, PowerBI, Confluence, SharePoint, InfoPath, advanced Excel. As part of different projects and engaged in the capacity of BA/PM, learnt insights of the role, project management techniques and tools.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Nomura CMT professionals are extremely helpful and guided me throughout the internship, team do trust interns with the work we do and this gives proper experience of the job, managers make sure that the work we do as an intern is continuously reviewed and provide us with feedbacks.

Academic courses relevant to the project: Derivatives and Risk management, Technical Report Writing.

PS-II Station:Nomura – Fin-Tech, Mumbai

Faculty

Name: Prof. Ambatipudi Vamsidhar

Student

Name: RAHUL SUNDARESHWARAN(2017A3PS0264P)

Student write-up

Short summary of work done during PS-II: Evaluated fintech opportunities across South East Asia region for Nomura to venture into by adopting emerging technologies in their lines of businesses or making a strategic investment in start-ups.

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

Objectives of the project: The objective was to scout for pockets of opportunity within the fintech landscape that Nomura can venture into. I had to form coherent view points around focus areas within fintech and evaluate start-ups and their business models within these areas.

Major learning outcomes: Major learning outcome would be robust understanding of how the financial services industry, specifically fintech, operates globally. I also learnt how to evaluate strategic fit of companies with the organisation, conduct research and diligence around early stage start-ups and promote an internal culture of innovation.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is great in the fintech team, where interns' opinions and views are considered strongly while working on major project pieces. Since it is a lean team, there is lot of focus on individual project interests and mentorship. The company expects you to be adaptable to changing landscapes and requirements, come with curious mindset and put in the number of

hours when deadlines are critical. It would be great experience for anyone looking to work at the intersection of finance, strategy and start-up ecosystem.

Academic courses relevant to the project: Business Analysis and Valuation, Financial Management.

PS-II Station:Nomura - Wholesale Strategy, Mumbai

Faculty

Name: Prof. Ambatipudi Vamsidhar

Student

Name: AARADHYA JAGGI(2017A4PS0630H)

Student write-up

Short summary of work done during PS-II: Worked on research and analysis for global wholesale strategy division in various asset classes like ECM, DCM, ALF and M&A, along with leveraging Nomura's position in AeJ via inorganic projects and comparing with competitor banks' earnings in aforementioned domains. Also worked on ESG space and investing opportunities in the same.

Tool used (Development tools - H/w, S/w): VM Ware Horizon Software, Citrix VPN, MS Office

Objectives of the project: Research and analysis for Nomura

Major learning outcomes: Finance application

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Excellent supportive work environment conducive to higher order thinking, seniors guide all the way through, company expects diligence and hardwork.

Academic courses relevant to the project: Business Analysis and Valuation.

PS-II Station:Nomura Global Markets, Mumbai

Faculty

Name: Prof. Ambatipudi Vamsidhar

Student

Name: MAYUR DHWAJ SINGH KHANGAROT(2016B3A30543P)

Student write-up

Short summary of work done during PS-II: I was part of Algo Strategies team (Mumbai) in Global Markets division. The team is part of the Global Quants team which is spread across London, New York, Singapore and Mumbai. The team supports Quantitative Investment Strategies(QIS) business verticals and directly works with QIS traders and structurers on developing index calculators and scripting new indexes in the proprietary Reflex platform. The project primarily focused on understanding the proprietary Reflex platform, which is used to calculate EOD index and risk levels. Migrating the QIS indices from End User Computing (EUC) i.e Excel workbooks to Reflex is the primary project which my team is currently doing as it is a long-term project. Got exposure to index construction methodologies for various asset classes (FX, Commodities, Rates) and I have scripted the FX and rates indices like G11 IRS, NMFX G10, and EMFX indices on the Reflex platform.

Tool used (Development tools - H/w, S/w): Python, Excel, C#, Reflex - Nomura's proprietary Index Calculator Platform, Microsoft Visual Studio, Git.

Objectives of the project: 1) Automation of indices on the reflex platform making the index calculations more robust and error free 2) Monitoring our trading and hedging portfolios on a daily basis to control any mismatches between the reflex and EUC calculation.

Major Learning Outcomes: 1) Learnt about the database management which helped me in understanding the flow of calculations used in Reflex.
2) Understood the complete workflow of a firm and its functioning.
3) Gained a business perspective for a project. Improving certain soft skills and confidence while having 1-1 discussions with senior executives.
4) Understood backend framework of Reflex which was built using C++ libraries.
5) Developed endurance to work for 10-12 hours per day.
6) Developed corporate work culture ethics.
7) Enhanced software knowledge: Ms Excel, Ms Powerpoint, SQL and internal Nomura frameworks like Reflex, Totoro, etc

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Treated like any other permanent employee and with that comes an expectation to deliver quickly as well as accurately. Also, lot of responsibility as decisions will be made on the information you provide. Sometimes, it was stressful but you get accustomed to it and also it's totally worth it. If you want a PPO in Nomura Global markets, then do opt for double sem PS.

Academic courses relevant to the project: Applied Econometrics, Mathematic and Statistical Models(MSM), Probability and Statistics, Object Oriented Programming, Data Structures and Algorithms, Derivatives and Risk Management.

Name: KHAMBHATI NIRAL DEVANG(2017A7PS0130H)

Student write-up

Short summary of work done during PS-II: I worked on migrating indexes from old excel sheets to their new Reflex system. There were one-off side project such as helping in decommissioning an old database and experimental work using deep learning for trading.

Tool used (Development tools - H/w, S/w): Excel, Visual Studio, Jupyter.

Objectives of the project: 1) Migration of index to new system 2) Decommissioning old database 3) Deep learning project.

Major learning outcomes: Got exposure to the financial world and got to work on the QIS business and understood it in depth. Improved my technical as well as communication skills. Got to work on diverse projects.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Nomura Global Markets is a great place to get into finance. The people are very smart as well as helpful. They give enough time and training to learn the required stuff. The projects depend upon requirements but you are encouraged to take full ownership as well as explore new project ideas to work on.

Academic courses relevant to the project: Security Analysis and Portfolio Management, Derivatives and Risk Management.

PS-II Station:Nomura Global Risk, Mumbai

Faculty

Name: Prof. Ambatipudi Vamshidhar

Student

Name: PARIPALLY THANMAY REDDY(2017A2PS0774H)

Student write-up

Short summary of work done during PS-II: Work is mostly project-based like automation of reports previously created manually through business intelligence software, writing and updating codes on Python and VBA to assist the day-to-day activities of the team.

Tool used (Development tools - H/w, S/w): VBA,Python,Business Objects and Excel.

Objectives of the project: Automated reports to be produced regularly, analyse and perform functions on large datasets through Python and VBA.

Major learning outcomes: Deeper understanding of VBA, Python and also knowledge on various financial products.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Helpful team members, good working environment, work hours can be long.

Academic courses relevant to the project: Derivatives and Risk Management, Financial Risk Analytics and Management.

Name: TEJAS NIMISH SHAH(2017A3PS0024P)

Student write-up

Short summary of work done during PS-II: My division, the HMD group, is responsible for the upkeep and management of data required for analysing Nomura's positions in various securities. There are checks in place to ensure that errors in the data are caught. I designed a new algorithm to catch errors like these, which were not detected until now. I developed the algorithm, created the SQL query required to obtain the data for the same, and programmed the check in Excel VBA. I also created an automated tool to update specific data graphs that are used by HMD group. This was a manual task until now, but it will now be done via a Python scheduler, which will automatically start and end the tool created by me.

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

Objectives of the project: Creation of an automated process for data updation and design of an algorithm for highlighting errors in HMD data.

Major learning outcomes: Learnt about softwares like Excel VBA, Power BI etc. Also obtained the interpersonal skills required in a corporate setup.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was a great working environment, even while working from home. It is fast, challenging, and needs critical thinking. The colleagues are extremely helpful, and put in efforts to ensure you understood the work thoroughly.

Academic courses relevant to the project: Computer Programming, Probability and Statistics

PS-II Station:Nutanix Technologies India Pvt. Ltd., Pune

Faculty

Name: Prof. Chandra Shekar R.K

Student

Name: PAI AMOL VIJAYANAND(2017A7PS0038G)

Student write-up

Short summary of work done during PS-II: As a part of Clusters team, there were two projects allotted to me. The first one was to help in reducing the cluster creation time by creating a new image of CVM. This was achieved by creating an image already having some services running, which won't need to be installed at runtime. I wrote the code in Python and tested it by creating cluster on AWS.

The second project was to create new image for every async release of AHV. The code for this project was also written in Python. I also wrote all the unit and integration tests for both the projects and integrated it with the master. Other than these, there were couple of side projects also. One was to design a soft curriculum in AWS services for the new employees joining Nutanix.

Tool used (Development tools - H/w, S/w): AWS, Packer, Qemu, Python, Java, Golang.

Objectives of the project: 1. Optimizing the build process to reduce the cluster creation time.
2. Removing a serious bug related to async AHV release.

Major learning outcomes: Writing efficient and clean code, learning and exploring different services of AWS, tools like Jira and Github to keep track of progress. Going deep into systems code to debug issues while creating cluster.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: All the people working at Nutanix are very helpful in solving all your doubts. The projects given were quality projects as they directly affected the production. Nutanix only expects that you have a will to

learn and participate actively. My mentor and manager were always helpful whenever I got stuck. Even if the whole internship was virtual, I did not feel any pressure of work anytime. The timings were flexible and the meetings were evenly spaced.

Academic courses relevant to the project: OS, DSA, Cloud computing.

Name: ADITYA VASUDEVAN(2017A7PS0175P)

Student write-up

Short summary of work done during PS-II: During PS, I worked on an ongoing project. The files analytics team was creating an AWS-based version of their existing utility. My work was divided into sub-tasks to facilitate this movement. In the first part, I worked on creating the infrastructure on the cloud database platform which would store the incoming data and process it. The process involved using the functions and features provided by the cloud database management system to mirror the tasks done on the on-premises database. The next part dealt with creating a password rotation manager Lambda on AWS to manage the credentials for this cloud database. Another subtask dealt with creating the infrastructure to facilitate the sending of ransomware notifications to the user based on certain events. The last task dealt with the design and implementation of path generation feature that would create the object paths for all objects in the system in an efficient manner and update these paths to be consistent with new incoming events.

Tool used (Development tools - H/w, S/w): AWS, Snowflake, JIRA, Gerrit.

Objectives of the project: The project was not an independent project in itself, it was part of a larger objective (creating an AWS version) that the team was undertaking.

Major learning outcomes: Software development in a corporate environment, development cycles followed and working with other teams to achieve common objectives.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Nutanix has a great company culture. Apart from an open environment, work related details (the project, its extent, timelines) are flexible and simply talking to your manager (or the relevant contact) will enable you to decide how you want to work. The company does not strictly monitor your hours (in a WFH setup), but expects you to set up deadlines for your work and take responsibility of completing it in time. Almost everyone you interact at the company will be willing to help you or will redirect you to someone who can. It is a great opportunity to work with teams across continents. If your team is spread across continents, it is possible that the working hours might get extended beyond the usually expected 9-5. However, teams are usually mindful of the same and timings never extend to unreasonable degrees. As an intern in the company, you will be treated on par with regular employee, receiving the same benefits (albeit watered down). The Engineering enablement team will also ensure that there are activities lined up to keep the interns occupied and will help provide access to a plethora of resources to learn and grow.

Academic courses relevant to the project: Cloud Computing, Database Management Systems, Data Structures and Algorithms, Operating Systems.

PS-II Station:Nutanix Technologies India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Chandra Shekar R.K

Student

Name: ABHISHEK GUPTA(2016B3A70576P)

Student write-up

Short summary of work done during PS-II: I worked with the AIOps team at Nutanix. Integrated the new collector framework end to end. It was a backend development project which involved working with open source framework opentelemetry to ingest metrics.

Tool used (Development tools - H/w, S/w): Golang, Docker, Git.

Objectives of the project: Design and implement opentelemetry framework for metrics collection.

Major learning outcomes: Better understanding of writing code in Golang. Understanding the significance of unit tests, some golang frameworks to write them as well as about product development.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is very good, the teams are generally very supportive and everyone listens to your opinion.

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

Name: HARPINDER JOT SINGH(2017A7PS0057P)

Student write-up

Short summary of work done during PS-II: I worked on creating a community edition of objects product for team objects at Nutanix.

Tool used (Development tools - H/w, S/w): C++, Gerrit, Git, Bash, JIRA.

Objectives of the project: To develop a community edition so that developers can play with it and it is easy for demoing to enterprises.

Major learning outcomes: Product Development, SDLC, Teamwork, Collaboration.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Great work environment, good learning outcomes, helpful mentors, managers and other team members.

Academic courses relevant to the project: Cloud Computing, Network Programming, Data Structures and Algorithms.

Name: VISHAL MITTAL(2017A7PS0080P)

Student write-up

Short summary of work done during PS-II: My work at platform solutions as an intern is to analyze the hardware data collected by a new tool NuCollector and compare it to the existing tool in production (NCC). My task involved automating this data analysis part so that it can be run on new clusters in future with one-click and all the analysis is available to the end-user. Based on this, I raised the JIRA tickets for solving the bugs in the Hardware Abstraction Library (HAL). Another task is to fix these bugs in the HAL by writing plugins for different hardware entities. After fixing the tickets, last job was to create a scalable database of command outputs on every hardware node that act like a cache.

Tool used (Development tools - H/w, S/w): Python, Gerrit - Code review, Git and GitHub, Sourcegraph, JIRA and Confluence, Jenkins – Build, SQL - DB Ops, Protocol Buffers - Serialization and Deserialization, VSCode - Remote SSH, Dremio - Data lake.

Objectives of the project: Establishing a unified, streamlined set of tools and processes for enabling, integrating, and qualifying all hardware with Nutanix software. Decoupling Nutanix software from the underlying hardware by developing a complete HAL. Allowing hardware vendors and other partners to bring up and qualify new hardware components and platforms on their own using the FleX tools.

Major learning outcomes: Team-work: Reading and working together on a common large code-base, computer server hardware, database designing, clean and maintainable coding style.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is chill (at least in WFH case). Meetings are neither too less, nor too much. Overall good learning environment.

Academic courses relevant to the project: Database Systems.

Name: DESAI JINEET HEMAL(2017A7PS0168G)

Student write-up

Short summary of work done during PS-II: As a part of Team Medusa, my work was distributed across three projects. First project was about improving the Cassandra progress monitor that would help us track the progress of dynamic ring change operations inside the cluster i.e. the transfer of metadata files among various nodes during ring change operations. Second project was about finding out the best technique for flat buffer compression in medusa cache, since compression would allow more entries in the cache; hence achieving a better hit rate. The third project was more of a developer productivity task which involved creating a new Auto Cherry Pick service that would help developers cherry pick important bug fixes in the

master branch to the desired release branches easily without worrying about the prescribed order rules, branch open/close status, etc.

Tool used (Development tools - H/w, S/w): C++, Python, GIT, Bash, Docker, Kubernetes.

Objectives of the project: First project's object was more of a feature enhancement task. The second project involved extensive testing over the cluster. Whereas the third project was a developer productivity task.

Major learning outcomes: Clean code writing, learnt best management practices, good view of how things in distributed systems work.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Work environment of Nutanix is quite good. People are quite helpful and are always willing to help. Also the company lays more emphasis on you getting to learn more things rather than just completing your projects/tasks. You are always included in all your team sync-ups and treated more as an employee rather than just an intern.

Academic courses relevant to the project: OS, Computer Architecture, Computer Networks.

Name: AKHIL AGRAWAL(2017A7PS0190H)

Student write-up

Short summary of work done during PS-II: Inside Nutanix, the PC-PE un-registration workflow was causing a lot of bugs and uncertainty. The registration workflow was also in a similar state earlier but was refactored recently, the same was done for un-registration in this project.

- 1) A task-based framework has been added over the un-registration workflow - We create one parent task which tracks the progress of several child tasks .Currently in the un-registration flow, there are several small sub processes, we make a child task for each of these sub-processes.As the child tasks get completed, we move forward the progress of parent Task. In case any of the child task fails, the parent task automatically fails. Only if all the child tasks get successfully completed, we mark the parent task as completed.
- 2) Cleanup, which was earlier performed using a Python script, now has been added as a part of un-registration workflow - For migrating these clean-up scripts, I had to understand how to construct complex IDF queries inside the prism gateway codebase. In order to successfully implement these I coordinated with the IDF team and got their review as well after successful implementation.
- 3) An annotation based method of declaring pre-checks and cleanups - This solution involves creating two custom annotations, one for pre-check and one for clean-up. Any team can declare their pre-check and clean-up functions in their own class with these annotations. The annotation processor will automatically add these to the un-registration workflow.

Tool used (Development tools - H/w, S/w): Maven - Apache Maven is a software project and dependency management tool. Based on the concept of a project object model (POM), Maven can manage a project's build, the version of dependencies to be used and several other properties in a central manner.

Objectives of the project: The objective of the project was to refactor the un-registration workflow and get rid of the flaws associated with it. Some of refactoring changes: 1. Adding a task based framework 2. Adding Zookeeper check to avoid race condition 3. Writing a custom annotation processor and generator.

Major learning outcomes: I learnt how to use Nutanix tools and libraries to quickly and efficiently create, manage new packages and services.Creating detailed and descriptive documentation was another key learning I had. The design docs helped me to understand how to analyse a problem and its requirements, come up with multiple solutions, identify their assumptions, pros and cons, etc.Some of the frameworks and libraries I learnt as part of this project are spring boot, Rest, JUnit, Java Poet, etc. I also learnt how to write proper unit tests that cover all possibilities and scenarios.I learnt the importance of proper logging through this internship. All the bug tickets that were assigned to me in this internship had the log files. Ability

to read and search the logs in an efficient manner was one of my key learnings. This also helped me realize what all things I should log in my own code for good readability of my logs in future. Code reviews helped me a lot to improve the quality of the code I write and familiarize myself with the various tech practices present in the industry. The review also helped me to understand how to find bugs and resolve them.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment at Nutanix is extremely positive. All the team members were available to me and were very helpful at every stage. They provided constant support, motivation and guidance throughout my internship. This internship was great opportunity for me to interact with people in different roles at Nutanix. It made me aware about the latest technologies used in the industry. It was a great place to experiment, learnt from the mistakes and find my interest field. It was also wonderful chance to improve my communication and presentation skills. After completing this internship, I am confident that I have learnt a lot and I am much more confident for my career ahead.

Academic courses relevant to the project: Computer architecture and Nutanix Codebase.

Name: ANURAG MADNAWAT(2017A7PS1923G)

Student write-up

Short summary of work done during PS-II: I worked in the Hypervisor team at Nutanix. The primary focus of our work was to develop novel approach to handle virtual machine live migrations. One of the major problems in VM live migration is memory dirtying. Dirtying refers to the modification of any memory page owned by the VM. Frequently dirtied memory needs to be transferred repeatedly over the entire duration of migration. As a result, when the memory dirtying rate is high and network bandwidth is limited, migration may not converge. Throttling VMs to reduce vCPU execution time is the current approach in QEMU to handle such cases of

high memory dirtying. Existing throttling algorithms throttle all the vCPUs of a VM, penalise read and write processes across all vCPUs equally. We developed new dirty quota based throttling algorithm that selectively throttles vCPUs based on their individual contribution to overall memory dirtying and also dynamically adapts the throttle based on the available network bandwidth. Our approach drastically reduced migration times and also enabled the convergence of migrations in P99 and P99.9 cases which was not possible before.

Tool used (Development tools - H/w, S/w): C, Vim, Git, Crash, kprobe.

Objectives of the project: Devise a vCPU, aware VM live migration algorithm that enables faster convergence of live migrations.

Major learning outcomes: Strengthened my OS and memory management concepts, learnt virtualisation from scratch, good understanding of KVM and QEMU codebases, gained Linux kernel development and debugging experience.

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. People were always a slack away and my doubts were taken care of immediately. I got really good project and was able to learn a lot from it. The internship program was managed very well and was beyond my expectations.

Academic courses relevant to the project: Operating Systems, Data Storage Technologies and Networks.

PS-II Station:Nvidia Graphics - Hardware, Bangalore

Faculty

Name: Prof. Brajabandhu Mishra

Brief write-up on each PS-II : NVIDIA Authorities are quite helpful supportive in integrating the student interns into the mainstream activities. The interns work on live projects of NVIDIA and they often interact with the teams located across globe. Indeed it is a great opportunity for an intern to work in NVIDIA (both Hardware and Software divisions).

The PPO percentage in NVIDIA is also quite high.

During the Covid-19 crisis, they supported the interns fully. Since the students were working from home, NVIDIA shipped company laptops to the interns. The mentors and managers also were in constant touch with the students so that students could contribute as per their potentials.

Followings are the details regarding the nature of the work and the expectations from the interns in NVIDIA Bengaluru.

1) NVIDIA Graphics Hardware, Bengaluru

The Hardware division of NVIDIA Graphics, Bengaluru deals with architecture, design, development and verification work related to GPUs and SoCs of NVIDIA. The work requires expertise in Digital Design, VLSI Design, Architecture Modelling of chips, Synthesis, Low Power Design, Circuit Design, Physical Design and Place and Route of complex VLSI chips. A large chunk of the work at each stage of the Chip involve Verification and Validation. Since the complexity is very large, entire design and verification process require a lot of automation. Hence such a work demands expertise in various scripting languages like Unix Shell Scripting, Perl and Python. Programming languages like Verilog, System Verilog, System C and C++ are necessary for design and verification of such complex circuits. Knowledge of Computer Architecture is essential for working in NVIDIA chips. Of course it is known that the interns may not have expertise in all of the mentioned topics. But it is expected that the interns should be fairly good in on Digital Design, Computer Architecture, Microprocessors, Verilog, Unix Shell Scripting, C++ etc. Knowledge on Python, Perl, System Verilog, System C, Low Power VLSI design, Physical Design, Circuit Design will definitely reduce the ramp-up time. Moreover enthusiasm to learn, faster ramp-up, proactiveness, a positive attitude are must have qualities required for the industry.

Student

Name: MANSI NAHAR(2016B2A30538G)

Student write-up

Short summary of work done during PS-II: Timing analysis: Work was based on the static timing analysis, using automation tools for doing timing runs etc. and then fixing the setup, hold and trans violation for the given chip.

Tool used (Development tools - H/w, S/w): Primetime and internal ECO tool of Nvidia.

Objectives of the project: Fixing the timing violation of the given chip.

Major learning outcomes: Static timing analysis.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Great people to work with. Helpful environment. Here, you will get sufficient time to ramp up and they will help you a lot in the process. Just be consistent and punctual.

Academic courses relevant to the project: ADVD and DD.

Name: KISLAYA KUMAR(2016B2A30754P)

Student write-up

Short summary of work done during PS-II: Was allotted to work in the PnR (Place & Route) team. Initial 2 months training was provided by the organisation for the same. Also was asked to learn TCL language. Next, project was allotted to perform Power, Performance and Area (PPA)

trials for a given block to help in IR (Voltage Drop) improvement. The project required modifying the existing PnR flow at Nvidia so that IR aware optimisation can be performed at an early stage. Was also given a smaller scripting project to work as well as allotted to work on a live Nvidia project.

Tool used (Development tools - H/w, S/w): NVIDIA confidential & proprietary tools, TCL, Python.

Objectives of the project: To Modify the existing PnR flow in a way that the tool performs IR aware optimisations at an early stage.

Major learning outcomes: Learnt in detail about physical design and PnR flow. Also gained some expertise in TCL language. Understood various reasons for IR drops in a design and how these problems can be fixed.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: People are very friendly and always ready to help. They are encouraging and expect certain level of independance post the training period.

Academic courses relevant to the project: Analog & Digital VLSI Design.

Name: MIHIR PRATAP SINGH(2016B3A30491P)

Student write-up

Short summary of work done during PS-II: The project I undertook aims for the improvement of signal-to-noise ratio (SNR) of clock domain crossing signals in unit RTL design flows. Addressed the issues related to metastability, reconvergence and gave a clean output through each clock domain. Set up regular regressions and dispatched reports of the output.

Tool used (Development tools - H/w, S/w): Perl, TCL, Meridian CDC, Unix Shell.

Objectives of the project: SNR improvement for Clock Domain Crossing.

Major learning outcomes: Clock Domain Crossing, Perl Scripting, FIFOGEN Regressions.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Nvidia is very thoroughly involved with the interns and conducted various seminars during the internship to address issues faced by the interns. Seminars were conducted to encourage involvement with mentors, managers and discuss problems being faced by interns. On a personal level, I felt that my mentor was regularly involved and helped me with on-boarding and getting accustomed to the work and work environment.

Academic courses relevant to the project: Digital Design, ADVD.

Name: VUPPALAPATI SAI JASWANTH(2016B5AA0908H)

Student write-up

Short summary of work done during PS-II: Worked on Perl plugins used in CPU NOC, ARM CHI implementation.

Tool used (Development tools - H/w, S/w): Jasper Gold, Verdi, Spyglass.

Objectives of the project: Implementation of network bridges and components in CPU NOC.

Major learning outcomes: ARM CHI, hardware design principles, timing closure, etc.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Very supportive work environment.

Academic courses relevant to the project: Computer architecture, Digital design, FPGA prototyping LAB.

Name: VIBHUI VERMA(2017A3PS0189P)

Student write-up

Short summary of work done during PS-II: Project involved the modification of PERL based tool to make changes in UPF code and policies to introduce clamps and level shifters in the RTL design path. It also required changes to the way Power Intent of chips was captured. Other part of project involved deployment of new functional verification of low power features deployed in GPUs at various points in time depending on the use case to save emissions.

Tool used (Development tools - H/w, S/w): Synopsis VCSt, Synopsis Verdi, PERL, Python.

Objectives of the project: 1) Modification of UPF code to make it consistent with RTL design 2) Deployment of new functional verification flow to test low power features in GPU.

Major learning outcomes: Concept of Power Aware Verification of circuits is something widely used in industry yet not found in conventional college curriculum. I learnt more about these concepts and how power structures are important to ensure that any power saving method is implemented correctly in silicon. Along with this, I also learnt other tools I used like Synopsis VCSt , Verdi and PERL/Python which enabled automation in this process.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Very good working environment, all team members are helpful you just need to approach them. Supportive in ramp-up, flexible working hours and interns getting the chance of working on live projects.

Academic courses relevant to the project: Digital Design, Computer Architecture, ADVD, Computer Programming.

Name: RITHIK DILIP RATHI(2017A3PS0266P)

Student write-up

Short summary of work done during PS-II: Major work involved understanding Formal Verification (FV) concepts and building testplans and executing them using FV techniques and working on property verification, sequence equivalence checking in SLCG(Clock Gating) enabled blocks and verifying constraints in standard simulation environment. Along with this, Implemented some automation scripts using Python as per team requirements.

Tool used (Development tools - H/w, S/w): System Verilog, Jaspergold, Synopsis VCF, Unix, Perforce.

Objectives of the project: To understand importance of verification in industry and in particular gain experience in using FV techniques.

Major learning outcomes: Building testplans for verification and their execution, bring up of formal flow, debugging using tools like Jaspergold and VCF, using version control tool - Perforce, using NVIDIA internal tools.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working culture and environment is very healthy. My team members were very supportive and helpful throughout the internship and you get treatment as good as full time employee and are

expected to make progress as you continue learning. In my team, there were different tasks I was assigned over time, and I was expected to report progress, ask for help whenever needed and deliver results. We also had some informal meets, which helped in building connections and also the working hours are flexible as long as you get your job done.

Academic courses relevant to the project: Computer Architecture, Digital Design, ADVD.

Name: PRAJWAL RAJESH DEVENE(2017A3PS0407H)

Student write-up

Short summary of work done during PS-II: Semi-formal verification of clock gating for various subunits of GPU pipeline, using sequential equivalence checking tools. Clock gating helps to reduce the power consumed in the chip when the unit is stalled or idle due to various bottlenecks in the design. Apart from this, build time optimizations were made to allow faster builds of the unit.

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

Objectives of the project: Semi-formal verification of clock gating in subunits of GPU pipeline.

Major learning outcomes: Semi-formal verification methodologies, digital design structures for large chips.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Everyone was really helpful in providing guidance whenever I asked for it. The company expects us to perform the projects and meet deadlines if any, although there is no pressure to do so.

Academic courses relevant to the project: Digital Design, Computer Architecture

Name: CHETAN CHAUHAN(2017A3PS0514H)

Student write-up

Short summary of work done during PS-II: As a part of the timing team (ASIC PD), I was involved in timing analysis at chiplet level, timing fixes and ECO apply. Timing signoff is one of the last steps in the IC design process. It ensures that signal propagation speed or delay in a newly-designed circuit such that the circuit will operate at the desired clock frequency. Timing signoff is performed with highly accurate models of the circuit under multiple sets of assumptions regarding expected variations, called “corners.” Process-voltage-temperature (PVT) corners are based on assumptions regarding variations in device operation from one IC to another, supply voltage and operating temperature.

Tool used (Development tools - H/w, S/w): Synopsys PrimeTime, Python scripting, Nvidia proprietary tools etc.

Objectives of the project: Objectives of the project includes performing the timing signoff of GPU chiplets and Python scripting to parse different types of warnings, errors, information, custom-errors etc. in zipped log files.

Major learning outcomes: Learnt VLSI flow, STA concepts - timing paths, skews, delays, PVT, OCV, clock reconvergence pessimism removal, process corners and Python scripting. The knowledge about backend data flow, chip tapeout workflow and timing analysis at chiplet level is acquired.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Nvidia has very professional and friendly working environment. Despite being a fully WFH internship, the company ensured interns not to face any issues. My team was extremely helpful and always

willing to clear any doubts. One is always encouraged to learn more about the tasks that one is completing rather than just finishing them. The work is full of learning, understanding and implementation of new concepts.

Academic courses relevant to the project: Analog and Digital VLSI Design, Advanced VLSI Design, Electronic Devices, Python Scripting.

Name: BHUPESH NIHAL(2017A3PS0597H)

Student write-up

Short summary of work done during PS-II: Carried out power test plan execution and analysis for the GPCARB unit (a memory subsystem unit for NVIDIA GPUs) for estimation of unit-level power efficiency in the pre-silicon phase of the chip design cycle for three different GPU projects.

Tool used (Development tools - H/w, S/w): Linux platform, Perl scripting, Perforce, C++, Verdi, Verilog and NVIDIA-internal tools.

Objectives of the project: The entire project was aimed at executing the flow used for estimation of unit-level power consumption in pre-silicon stage. Power tests were created that helped find out the dynamic and leakage power numbers under various operating modes and conditions; the various levels of clock gating, their coverage and efficiency metrics; power vs performance and power vs area tradeoffs; and also to perform comparisons between power numbers from different kinds of traffics, or from different GPU projects.

Major learning outcomes: Understanding of GPU ASIC design flow; architecture; motivation behind and ways of reducing power wastage in ICs; different levels and implementations of clock gating and their corresponding impact; ways of analyzing and improving clock gating coverage and efficiency; experience of working on several live projects in parallel.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Very relaxed working environment, emphasis is made on understanding the motivation behind carrying out tasks. Ample time given to understand and implement tasks. Plethora of sources to learn stuff from excellent mentorship. Communication holds the key, especially because of WFH setting.

Academic courses relevant to the project: Digital Design, Computer Architecture, Analog and Digital VLSI Design, Microprocessors and Interfacing.

Name: VIREN KHEMCHAND RAMCHANDANI(2017A3PS1000H)

Student write-up

Short summary of work done during PS-II: Worked on implementing the UFS protocol on FPGA. UFS is part of the high speed IO of the Tegra SOC. The functionality of the RTL for UFS needs to be verified before the chip is taped out. The project began with creating a GT wrapper, which is an IP present on Xilinx Ultrascale FPGAs and supports prototyping of HSIO. Then, the wrapper was integrated with FPGA-PHY layer of the RTL. UFS operates in various gears (i.e. speeds) ranging from G1 to G4 in LS and HS mode. Behavioral simulations were then performed on the design to ensure the functionality of the wrapper. Later, the design was partitioned and bitfiles were generated. Then, the UFS was brought up on the board and tests were run for various gears and power modes.

Tool used (Development tools - H/w, S/w): Vivado, NVIDIA's proprietary HDL, Verdi, nWave, HAPS Protocompiler, Gvim, Visio, Perforce, Shell & Python Scripting & Unix.

Objectives of the project: Implementing UFS portion of Tegra SOC on the HAPS prototyping system.

Major learning outcomes: RTL level modifications in the design; IP wrapper creation in Vivado; Debugging using Verdi & nWave; Creating bitfiles with proper constraints; debugging on

the board using protocompiler; creating and launching Shell &Python scripts; team work; documentation.

Details of papers/patents: Not Applicable

Brief description of working environment, expectations from the company: Nvidia is a company well known for its decent and healthy work environment. I was welcomed very nicely by my team and my manager and was also mentored well. The work is totally task oriented with flexible time constraints. The initial training sessions by HR and technical teams are very helpful in ramp-up of various things. One can build up skills in various domains along side work by accessing their enormous library of technical courses.

Academic courses relevant to the project: Digital Design, FPGA based System Design, Communication Systems & Networks.

Name: MIHIR AJAY CHAVARKAR(2017A8PS0026P)

Student write-up

Short summary of work done during PS-II: Work done involved setting up and sanitizing various verification flows like XPROP, GLS and Power stim. Build related issues found were resolved and new bugs both TB and RTL found were fixed. Worked on enabling BLCG and SLCG for a particular PCIE unit and resolved RTL/architectural issues found. Also, developed scripts to automate different verification flows and worked on debugging/triaging bugs found in regressions including general bugs and feature specific bugs (TB and RTL). Worked on ILA feature verification which included going through test plan, verification strategy, enabling ILA detectors and developing randomized tests to verify it along with TB side changes to add additional signals to the ILA.

Tool used (Development tools - H/w, S/w): Synopsys VCS, Synopsys Verdi, Perforce.

Objectives of the project: Understanding the basics of RTL frontend verification and various aspects of verification cycle along with hands-on learning of various verification flows for RP units followed by its unification across chips. Also learning the basics of UVM and PCIE architecture, followed by contribution to debug/fixes. In addition, working on ILA feature verification and developing scripts to automate various verification flows.

Major learning outcomes: Learnt about flows like XPROP and GLS and got hands-on experience. The entire DV code base developed by Nvidia uses UVM and does constrained random testing. So, learnt about UVM, system verilog and PCIE architecture and was able to learn and gain hands-on experience on various aspects of frontend verification. Also, learnt about clock gating in detail and was able to enhance scripting skills. Learnt how feature verification is done, how verification strategy is developed, test plan is developed and how a particular feature is enabled and verified completely. Knowledge of PCIE architecture was also used in identifying RTL issues.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment was conducive to encourage learning. All the interns were assigned live projects. A perfect balance of learning and execution of tasks was maintained. Manager always encouraged me to consider every task as a learning opportunity, provided extra reading material like articles, research papers, etc. so as to understand a particular topic in greater detail and not just stick to Nvidia specific aspects of the topic. It was easy to interact with people across different teams, who went a step further to clarify doubts or explain about particular topic in greater detail. Mentor was instrumental in initial ramp-up training which included learning about UVM, system verilog and PCIE architecture for me. The company expects you to take initiative and explore different aspects of the task and basically take ownership of the task. Timely completion of the internship deliverables while maintaining the quality of work is crucial. Having a concrete understanding of basic concepts is also important. To conclude, the work environment was amazing and provided ample opportunities for overall growth of the intern.

Academic courses relevant to the project: Digital Design, ADVD, Computer Architecture.

Name: ATEEKSHA MITTAL(2017A8PS0431P)

Student write-up

Short summary of work done during PS-II: On-chip debugging uses the provision of an additional debugging interface to the live hardware, in the production system. It provides features such as inspection of internal state or variables and ability to set checkpoints, breakpoints and watchpoints. The project taken care under the internship duration primarily aims at setting up a brief background and significant details regarding the ongoing work for Tegra Chip Bring-up, followed by covering technical aspects of learning that includes debugging tools. It also covers the major SOC command lines testing done on FPGA as part of the internship. In addition to this, the work also encompasses learning about feature additions in existing tools. Chip's logic analyzer can be programmed and handled by debugging tools. The work was focused on automating the flow of capturing debug signals from chip internal units into VCD file to efficiently analyze the debug signals by a waveform viewer tool like Verdi, GTKwave etc.

Tool used (Development tools - H/w, S/w): H/W - FPGA, S/W - C, C++, Python, Verdi.

Objectives of the project: Chip debugging tools feature development for Next Generation Tegra Chip Bringup.

Major Learning Outcomes: 1. Learnt about how chip debugging tools are developed2. Explored how is the feature addition in existing tools are carried out 3. Testing of the debug features on platforms like system FPGA 4. Learnt how is work carried out in professional work environment.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work environment at NVIDIA is certainly very agile as well as challenging. The people across the teams are collaborative, friendly and inspiring. My manager and mentor are very supportive

throughout the period of internship. Overall, the experience was undoubtedly wonderful that allowed me to explore more through the Electronics core sector and provided me with opportunities where I could learn and experiment things with both guidance as well as flexibility.

Academic courses relevant to the project: Digital Design, Microprocessors and Interfacing, Computer Architecture, C, C++, Python.

Name: BHAGYAM GUPTA(2017A8PS0525P)

Student write-up

Short summary of work done during PS-II: My work at Nvidia consisted of two projects. First project was on functional coverage analysis of the functional verification process of a memory controllers fabric. The task was to write the functional coverage codes (using System Verilog constructs) for the unit's interfaces as well as the Address Map features and analyze the coverage reports to find any holes in the verification process. Second project was to enable an automated code coverage flow, which using Formal Verification application improves the efficiency of the code coverage analysis. This was done for all units present inside a cluster level design, later a script was written to make the flow user friendly.

Tool used (Development tools - H/w, S/w): System Verilog, UVM, VCS (Simulation tool by Synopsys), VCF (Formal tool by Synopsys), Perl Scripting, Unix, Nvidia internal tools.

Objectives of the project: 1. To meet the functional coverage requirements for a unit's coverage driven functional verification process 2. To enable/ enhance the formal verification application driven automated code coverage flow inside a cluster, to improve the performance of code coverage analysis used in a coverage driven verification process.

Major learning outcomes: 1. ASIC verification flow 2. Functional verification concepts 3. Formal verification concepts 4. Coverage driven verification 5. SV, UVM concepts 6. Overview on design architecture of the units 7. Scripting techniques.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment at Nvidia is really amazing. Mentors and manager are supportive and friendly, they are experts in their field and one can learn a lot from them. Flexible working hours, well managed work from home situation, regular sync ups and well planned projects are some of the key features. Nvidia provides with a lot of opportunities, one has to be inquisitive and proactive to make the best out of it.

Academic courses relevant to the project: Computer Architecture, ADVD, Digital Design, Microprocessor Programming and Interfacing.

Name: VARSHA SINGHANIA(2017A8PS0563P)

Student write-up

Short summary of work done during PS-II: The project geared the XUSB team for making of the scoreboard over the testbench. Flow flushing with monitor enabled was required to convey the correct information to the scoreboard. It also improved the quality of the testbench by introducing overcurrent scenarios and different low power entry scenarios.

Tool used (Development tools - H/w, S/w): Verdi, Linux, gvim, System Verilog.

Objectives of the project: The objective of this project was to flow flush the Port State Machine transitions for USB3.0 with monitor enabled. The project also covered introduction of the Over Current scenario in the testbench and different possible scenarios while transitioning to a Lower Power Mode (LPM).

Major learning outcomes: 1. System Verilog (SV), Universal Verification Methodology (UVM)2. Deeper insight into XHCI and USB functioning3. Port state machine for USB 3.0 4. Situation of overcurrent 5. Low power modes for USB 3.0 and different concurrent entry scenarios.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Work environment was friendly and professional at the same time it required timely completion of work. Team members were very helpful and often went out of their way to unblock my work.

Academic courses relevant to the project: Computer Architecture, Digital Design.

Name: SAMANE NAGESH SANJAY(2017A8PS0612P)

Student write-up

Short summary of work done during PS-II: i. Understood current crossbar architecture and design in details. Learnt formal verification method through sample examples and reference reading material.

ii. Looked into already existing set-up/code base for previous crossbar. Found few bugs in the code and after fixing them, upscaled the code for current crossbar.

iii. Created a testplan for formally verifying new starvation avoidance logic in scheduler block. Discussed the plan with team/manager and tuned it based on their feedback. Plan is very exhaustive and covers all the interesting scenarios to verify the design.

iv. Implemented the testplan in phased manner. Reported RTL bugs found during debug of counter examples (failing assertions).

v. Documented all the results on confluence page, submitted well commented testbence code to the organization's internal servers.

vi. Presented findings of work to my team along with one of the cross-teams at organization's headquarter.

Tool used (Development tools - H/w, S/w): Cadence JasperGold FPV tool.

Objectives of the project: To deliver formally verified scheduler unit block in NVSwitch crossbar.

Major learning outcomes:

- i. On a broader picture, I understood the importance of NVSwitch for 1:1 GPU-to-GPU communication in high performance computing, and AI data-center market segment. Also the importance of formal approach used in the project on top of traditional verification approach for verifying such complex chip.
- ii. Detailed understanding of high-speed interconnection network architecture and design through discussions with team members and internal documents.
- iii. Developed good understanding of formal verification methodology- through reading theory behind it, hands on training using JasperGold tool. I learnt to use FPV tool very effectively.
- iv. Learnt formal testbench planning approach. It developed my thought process for thinking about the interesting test cases to verify the design.
- v. Improved upon my verification and debugging skills, Verilog coding skills, RTL design understanding approach, and presentation skills.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: Excellent working environment. The team members/mentor were always available to resolve my queries and helped me develop understanding of the chip architecture/design in very detailed manner. My manager always encouraged me to ask "why" on top of "what" and "how" for a given task. This helped me to be curious all the time and understand the work I am doing at larger picture- how it fits into organization's larger goals and the same is expected from the interns. It is expected that one should always ask the questions to understand nitty gritty details of your work, but before asking you should do proper homework.

Academic courses relevant to the project: Digital Design, Computer Architecture.

Name: PAREKH PRASHIL BHAVESHBHAI(2017AAPS0227G)

Student write-up

Short summary of work done during PS-II: There is no intern project as such so all the work done were live projects going on in Nvidia. I was in the Memory subsystem RTL design team, so my projects were based on scripting, synthesis and RTL design. There was not a uniform project for me but there were multiple projects spread throughout the internship.

Tool used (Development tools - H/w, S/w): Perl, Synopsis Verdi, Spyglass, Nvidia propriety tools.

Objectives of the project: To get a basic idea about the VLSI front-end design flow.

Major learning outcomes: Learnt about the microarchitecture of various memory related components, got introduced to some aspects of RTL design and synthesis.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment is very good. All the team members are really nice and would solve all my questions and are approachable. I used to have daily sync ups with my mentor and biweekly sync ups with my manager. All my doubts were solved either by my mentor or someone else from the team. The interns are given ample time to finish their projects.

Academic courses relevant to the project: Digital Design, Computer microarchitecture, ADVD

Name: GONA YASWANTH REDDY(2017AAPS0243H)

Student write-up

Short summary of work done during PS-II: I was part of Full Chip Verification team. The initial objective was chip execution support where I was assigned to debug failures for an ongoing chip verification. The process of debug involved going through all logs and looking through waveforms of the simulation to understand the failure and fix it. The failures were mostly from a selected group of tests. Later, I was assigned with automation tool enhancement which helps reducing the time taken to trigger debug runs and file bugs for which I used PERL for scripting.

Tool used (Development tools - H/w, S/w): Perl, Perforce, Verdi Waves, Unix.

Objectives of the project: For the first 3 – 3.5 months, the objective was chip execution support for an ongoing project. Later, it was automation tool enhancement.

Major learning outcomes: Apart from learning scripting languages like PERL, I also got a deeper understanding of the GPU Architecture, the units and their functions and dependency. I got to see how verification is done in industry, the important role it plays in manufacturing of a chip and what are some important aspects considered during a full chip verification like bug tracking etc.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Despite it being a WFH PS, we were ensured that we face no issues during the internship. NVIDIA has a wonderful work environment. Everyone is willing to help and answer questions at any time. Interns are treated no different from employees. Both my mentor and manager helped me improve not only professionally but also personally. People expect you to be proactive while learning things and forthcoming about work.

Academic courses relevant to the project: Computer Architecture, Computer Programming, Basics of Operating Systems.

Name: SUHAS H V(2017AAPS0252H)

Student write-up

Short summary of work done during PS-II: I was part of the GPU architecture team at Nvidia. The GPU arhitecture team is involved in finding solutions to improve graphics performance in GPUs. Work involved implementing new features for future chips in the functional model of different GPUs. The functional model serves as the golden reference for RTL. Work also involved discovering bottlenecks and issues in current GPUs such as power consumption and scaling, exploring solutions to optimize these in future GPU generations. There were some bugs that needs to be fixed during the course of internship too.

Tool used (Development tools - H/w, S/w): Linux, Perforce, C++, Nvidia internal tools.

Objectives of the project: To introduce new features in the functional model of future GPUs. To explore solutions to overcome issues identified in current GPU generations by running various experiments and tests.

Major learning outcomes: GPU architecture and algorithms at play in diffferent GPU pipeline units.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment at Nvidia and in particular the GPU architecture team is very supportive. Interns are given enough time and resources to ramp up and understand the existing infrastructure. Everyone on the team is enthusiastic to help and resolve queries. It is expected that interns are as indepedent as possible and inquisitive.

Academic courses relevant to the project: Computer Architeture, Advanced Computer Architecture, Digital Design.

Name: MEHTA SAMIDH VIMISH(2017AAPS0288G)

Student write-up

Short summary of work done during PS-II: I was part of GPU Memory Subsystem Performance verification team and worked on multiple projects during the internship.

1. Bring up and test a performance Simulator (C++ based) for GPU Memory Subsystem of a chip. A comparison with RTL simulator was made to get additional details about bottle-necks and possible bugs in the memory architecture.
2. Build an infrastructure to calculate latency and identify starvation issues in the memory system. It tracks the packets at all interfaces across various workloads and provides additional graphs and statistical interpretation. (C++, Python scripting)
3. Add task protection to prevent breakage at the top-of-tree. It protects the changes made to Perforce (software management system) where a piece of code is verified automatically before being available to all users.
4. Create a configuration of the memory subsystem for RTL testing. The memory subsystem configuration for RTL testing aims to create similar system as the full-chip for accurate testing of RTL workloads. (Viva, Verilog, Perl, Synopsys Verdi)

Tool used (Development tools - H/w, S/w): HDL- Viva, Verilog.

Scripting- Python, Perl

High-level language- C++

Simulators- NVIDIA internal simulators, Synopsys Verdi

Objectives of the project: The infrastructure built across projects was used to improve productivity and provide additional scope for performance testing for the memory subsystem of GPUs. Researched into different systems which the team had not explored before.

Major learning outcomes: Introduction to the architecture of the Memory System of a GPU. Worked on 2 different GPU tracks (Data Center applications and Gaming) and understood differences between them. Worked on simulators based in high level language and RTL. Scripting done in Python and Perl for automation of tasks.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Entire PS was WFH. Flexible timings, you just have to get the work done- doesn't matter how many work hours you clock. Manager and team-mates are helpful and it was a great learning experience for me. NVIDIA doesn't distinguish between an intern and full-time employee and thus you'll be working on real time projects and will be able to see how your work is significant for the company.

Academic courses relevant to the project: Computer Architecture, Digital Design, Computer Programming.

Name: DIGVIJAY SINGH(2017AAPS0317H)

Student write-up

Short summary of work done during PS-II: Two projects were finished during this internship. The first project involved the Timing Verification and Closure of a chip. Analysis of timing paths was done in PrimeTime. Timing fixes and Engineering Change orders were applied repeatedly. For the second project, uncertainties were determined for voltage domain-crossing paths by comparing the path delays in PrimeTime timing reports and SPICE simulations.

Tool used (Development tools - H/w, S/w): Linux CLI, PrimeTime, hSPICE, NVIDIA proprietary software.

Objectives of the project: 1)Timing Closure of Chip 2)Determination of MV Uncertainties for signoff.

Major learning outcomes: 1) ASIC design workflow 2) Timing analysis 3) Usage of CLI.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment was excellent. Employees are helpful and extremely caring. No overtime is expected from intern as long as the assigned work gets done, which is not much - workload is average only.

Academic courses relevant to the project: Analog and Digital VLSI Design.

Name: SHREYAM KUMAR(2017AAPS0346H)

Student write-up

Short summary of work done during PS-II: Work was done in automation of Formal Verification of ISO 26262 compliant modules. Aim of the project was to reduce license usage of formal tool during verification process.

Tool used (Development tools - H/w, S/w): Tools were mostly Perl and Python programming. An understanding of SystemVerilog Assertions was also required.

Objectives of the project: Objective was to reduce license usage of Formal Verification tool. Also, enhancements were made so that the verification flow can be made tool agnostic.

Major learning outcomes: I learnt a lot about Formal Verification, a lesser known form of verification. I also learnt how the flow of verification works and got hands on experience using formal tools and understanding how they work to verify the modules.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The environment was friendly. My mentor encouraged me through the whole internship and helped me whenever I was stuck. A healthy growth environment was provided at the company.

Academic courses relevant to the project: Computer Architecture, Digital Design.

Name: PRANAV ANAND P(2017AAPS0379H)

Student write-up

Short summary of work done during PS-II: The project was geared towards developing and implementing a procedure to automate the retiming process for SoC interfaces. An algorithm was designed and subsequently implemented in Python to estimate the number and exact location of the retiming stages in the floorplan given the source and destination partition. Subsequently, the corresponding retime spec files for all interfaces were modified to populate them with the obtained retiming details, and separate codes were written for automating this process as well.

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

Objectives of the project: The core aim is to automate the retiming process for SoC interfaces as this will help save valuable time and cost during the chip design process. It will also be easier to handle any last-minute floorplan changes if required.

Major learning outcomes: The internship gave me the confidence and ability to solve a problem analytically and implement it. I was able to improve my Python coding skills and became familiar with the Unix platform. More importantly, it gave me a detailed insight into how many different teams collaborate together in the chip design process. It taught me how to collaborate with team mates and people from other teams instead of working all by myself, and gave me a taste of working in corporate environment.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The best part about NVIDIA has to be the flexibility and the trust that the company has on its interns. It takes

care of its interns really well and offers them all kinds of support whenever needed. This was especially beneficial in WFH environment in the midst of a pandemic. Every intern is given same treatment as a full-time employee whether it comes to perks or speaking one's ideas out. My mentor always ensured that I understand the importance of my project and learnt something new in every step. People are very welcoming, you can reach out to anyone you want and they will be happy to help you out.

Academic courses relevant to the project: Digital Design, Analog and Digital VLSI Design.

Name: DIVYAM SHREEVATSAL(2017AAPS0384G)

Student write-up

Short summary of work done during PS-II: Performing Electrical validations of clock modules on a chip as part of Post-Silicon characterization is an important step to verify the proper functioning and operation of chips/SoCs, post manufacture and to detect, fix and localize escaped bugs from Pre-Silicon verification phase before mass production. The project had an objective to understand the clocking architecture of discrete GPUs and to learn the use of measurement equipment such as High-end Oscilloscopes and techniques required for Electrical validation. A significant goal of my project was to optimize Post Silicon characterization flow through automation in Electrical validation of clock modules present in discrete GPUs and Tegra SoCs thereby reducing manual interventions, meeting strict timing constraints, and ensuring efficient utilization of expensive hardware resources involved in the characterization process flow.

Tool used (Development tools - H/w, S/w): Nvidia Internal Tools, JavaScript, Python Scripting, Shell Scripting, Perl Scripting.

Objectives of the project: Post Silicon Validation.

Major learning outcomes: Industrial work mainly, Professional and Technical Skills, Personal Development.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was a wonderful experience working at Nvidia. I was thrilled by the work I was involved in and enjoyed completing those tasks. Manager, mentor and the entire team was so supportive and friendly.

Academic courses relevant to the project: ADVD, CompArch, ESD, DD, MuP, CP, MuE, ES, ED.

PS-II Station:Nvidia Graphics - Hardware, Hyderabad

Faculty

Name: Prof. Krishnendu Mondal

Student

Name: POTLA SAI ADITYA.(2017A3PS0268P)

Student write-up

Short summary of work done during PS-II: Worked with Bangalore team as PS II is completely WFH. Worked on two different projects. First one is development of area estimation tool to estimate the area of interconnect fabric design based on the area of old designs. A GUI is also developed for the tool. Perl, HTML and JavaScript which I learnt during PS II are used mainly. The second project is automation of the generation of the formality waivers to reduce the number of violations reported by the formal verification need to be reviewed manually. Worked mainly using Perl and also worked with synthesis tool.

Tool used (Development tools - H/w, S/w): Perl, HTML, JavaScript, Synopsys synthesis tool.

Objectives of the project: Development of GUI based area estimation tool for interconnect fabric and formality waiver generation automation.

Major learning outcomes: Learnt Perl, HTML, JavaScript, synthesis and formal verification.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work is from home due to COVID 19 restrictions but the team members, mentor and manager are very helpful, supportive and are approachable at anytime. They are helpful to solve the difficult problems. There was a weekly meet with manager and mentor to sync up regarding the process and some suggestions were provided related to project. They expect us to solve all the problems and do not compromise at any situation and they will help us to solve the problem if we are stuck.

Academic courses relevant to the project: Programming, Digital design, Computer architecture.

Name: KORRIPADU THARAK RAM(2017AAPS0464H)

Student write-up

Short summary of work done during PS-II: Verifying DSI DPHY protocol.

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

Objectives of the project: Creating a UVM based TB.

Major learning outcomes: UVM

Details of papers/patents: None

Brief description of working environment, expectations from the company: Pretty chill environment.

Academic courses relevant to the project: Computer Networks, Microprocessor Interfacing.

PS-II Station:Nvidia Graphics - Software, Hyderabad

Faculty

Name: Prof Krishnendu Mondal

Student

Name: TANMAY DIXIT(2016B2A30593G)

Student write-up

Short summary of work done during PS-II: First part was integration of SDKs into the NBX application. This included adding new effects to the camera. Many of these effects are really innovative and proprietary Nvidia products. Part two was creating demos for the implemented camera effect. That included a lot of programming and understanding past code. Third was to create a system in order to create a modular method for easy and quick testing of new SDKs via the NBX application.

Tool used (Development tools - H/w, S/w): Visual studio code.

Objectives of the project: Add new effects to the Nvidia broadcast app and improve the existing follow of development for those features.

Major learning outcomes: Learnt how to code on a massive codebase was an important experience. Along with that version control and writing clean code was a new challenge. It was fun integrating amazing SDKs on customer facing products.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Nvidia has very positive and fast paced work environment. Focus is on innovating even at the smallest scale. People and the staffs are super responsive. The motto is to create at the speed of light and surpass obstacles quickly.

Academic courses relevant to the project: Object oriented programming, Computer programming, Digital image processing.

Name: ANIMOY SINHA(2017A3PS0472H)

Student write-up

Short summary of work done during PS-II: The work involved design of a web portal to generate entity configuration files which are essential to the software development life cycles of the organization. Previously these files were hand typed, were slow and inefficient. The web portal sped up the process and removed manual parts of the project. The project involved full stack development.

Tool used (Development tools - H/w, S/w): Angular, Springboot, Flask, CORS.

Objectives of the project: To make a web portal for the use of the organization.

Major learning outcomes: Project planning, SDCs and web design.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Since it was WFH, the working environment was good. The mentors and managers were incredibly helpful. 2-3 meetings per day was a common thing. Company expects dedication and minimum sense of programming from the student.

Academic courses relevant to the project: DSA, OOPs.

PS-II Station:Nvidia Graphics -Software, Bangalore

Faculty

Name: Prof. Shri Prasad M

Student

Name: NIKUNJ MITTAL(2016B2AA0546G)

Student write-up

Short summary of work done during PS-II: I was part of the Conversational AI project, where we worked with the ASR(Automated speech recognition) side of things. My tasks involved optimizing the different sections of the pipeline. I had the opportunity to curate training and evaluation datasets from raw data and develop a tool to do ASR with other supports such as detailed reports of analysis on models and datasets.

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

Objectives of the project: Improve ASR pipelines.

Major learning outcomes: Bash, Python, NLP, ASR.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment at Nvidia is amazing. An intern is giving ample and equal opportunities to contribute and is treated just like any other permanent employee. Work timings depend on per team basis but its mostly flexible. An intern is expected to continuously adapt and deliver the tasks within deadlines. All the managers and team members are really helpful.

Academic courses relevant to the project: DSA, OOP.

Name: SAGAR BOGADI MANJUNATH(2016B4AA0396G)

Student write-up

Short summary of work done during PS-II: The main project was related to NVIDIA Jarvis - a platform for building conversational AIs. My role in the project was to complete a feedback mechanism for bot developers to test chatbots, fix errors in chatbot response, easily update datasets used for bot training with new data and train a new bot/model - by planning and creating a tool called 'Interactive Learning'. Other tasks included writing tests and benchmarks to gauge the accuracy of the chatbots - and analyze the results in a meaningful way for QA teams.

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

Frameworks: NVIDIA Transfer Learning Toolkit (TLT)

Misc: Git, Gerrit, Jira, etc

Objectives of the project: To develop a pipeline for chatbot developers to maintain and improve the performance of their chatbots.

Major learning outcomes: Learnt a lot about NLP, Python, Version control (via Git), good coding practices and conventions, documentation, etc

Details of papers/patents: NA

Brief description of working environment, expectations from the company: By its own testimony, the company is informal but not casual. Interns are treated as employees, and high expectations are held. However, all employees are very approachable and conversations between employees do not directly work with also frequently occur (even in a work-from-home setup). Managers are patient with you, and the only main expectation is to learn from your mistakes. From a technical standpoint, there are plenty of opportunities to work on various technologies of your interest. You are expected to show interest in projects/tools that you might not directly be working on, but are related to your main assignments.

Academic courses relevant to the project: Data Structures & Algorithms, Machine Learning.

Name: PRATEEK MAHAJAN(2017A3PS0317P)

Student write-up

Short summary of work done during PS-II: Worked with infra team in Nvidia. Basically this team's responsibility is to develop tools for architecture teams to use while testing prospective features of GPUs. I worked on a novel event handling mechanism for their trace generating tools to provide greater flexibility to users. This will enable increased speed and efficiency in GPU development. Most of this work was based on OOP and DSA concepts. However, it requires some knowledge of Gpu architecture and hardware.

Tool used (Development tools - H/w, S/w): Git, Gerrit, Jira.

Objectives of the project: To design and implement a novel event handling mechanism.

Major learning outcomes: OOP design, DSA, GPU arch.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work environment was good, team was very helpful, the company expects an output from your project, nothing else.

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

Name: GUPTA MEGHA RAJEEV DIVYA(2019H1030117H)

Student write-up

Short summary of work done during PS-II: The work focused on compression of residues for video streaming. The work initially started with compression of video residual latents from existing autoencoder based deep learning model in the proposed pipeline using lossless entropy coding techniques like Huffman coding, Arithmetic coding and others. Later, the work was being done on the entire residual compression model. It required enhancement of the current model to achieve better compression and bitrate. The work involved understanding the video codecs, video quality metrics, understanding deep learning models, and doing extensive research in the field of deep learning based video compression models. The work further focuses on finding other similar models in the domain, giving their proof of concept, training and testing them (done in tensorflow/Pytorch), enhancing them for the use case, suggesting and using innovative ideas as the pipeline in the project is entirely new.

Tool used (Development tools - H/w, S/w): Python, Tensorflow, Pytorch, C++, Linux, Perforce

Objectives of the project: Improve video quality through fusion of video CODEC and deep learning frameworks.

Major learning outcomes: Different lossless and lossy entropy coding techniques, Video codecs, Implementation of deep learning models in Tensorflow and Pytorch, autoencoder based deep learning models.

Details of papers/patents: N/A

Brief description of working environment, expectations from the company: Treated as an equivalent employee, suggestions and ideas are always heard and considered if has potential. Very helpful mentor, team and great to work with manageable workload. Lot of opportunity to learn and enhance many technical skills and life skills from the company.

Expectations: Dedicated, getting work done on time, interest towards work and subject, proactive and good communication skills, thinking out of the box.

Academic courses relevant to the project: DL, ML, Foundations of data science.

PS-II Station:NXP India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Krishnendu Mondal

Student

Name: PARVADHA K(2019H1230037H)

Student write-up

Short summary of work done during PS-II: The internship offered me an opportunity to learn and understand various PDK validation tasks like Digital flow, General checks and Backend validation checks.

Tool used (Development tools - H/w, S/w): EDA tools for P&R, EMIR and QRC flows, TCL, Perl.

Objectives of the project: Validation of PDK.

Major learning outcomes: I was given a great chance to work on various PDKs and get myself exposed to various issues which led me to improve my debugging skills. Further, I experienced working with various EDA tools and those that were in-built by the organization. It further helped me to get exposed to few scripting languages and automation.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The internship offered me an opportunity to learn and understand various PDK validation tasks like digital flow, general checks and backend validation checks. I was given a great chance to work on various PDKs and get myself exposed to various issues which led me to improve my debugging skills. Further I experienced working with various EDA tools and those that were in-built by the organization. It further helped me to get exposed to few scripting languages and automation.

Academic courses relevant to the project: CAD for IC design.

Name: SANTHOSH K(2019H1230046G)

Student write-up

Short summary of work done during PS-II: Using spectre circuit simulator standalone measurement-delay, leakage, energy was done for worst case PVTs for different libraries and body bias effect was observed through trend graphs.

Tool used (Development tools - H/w, S/w): Spectre, Virtuoso, Silicon smart.

Objectives of the project: To do impact analysis using ring oscillator.

Major learning outcomes: Impact analysis, standard cell characterization.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Project working environment was good. Mentor gave assignments with no hard deadlines. They expect interns to learn more, approachable and helping a lot.

Academic courses relevant to the project: CAD for IC design, VLSI design.

Name: MANNE CHANDRAKALA(2019H1230050G)

Student write-up

Short summary of work done during PS-II: I am part of physical design team (backend team). The training was on block level implementation of SOC starting with synthesis, floorplan, placement, CTS and routing (PnR). Synopsys Lynx flow is used for physical design flow, all scripts and tools are incorporated in it. For synthesis, Design Compiler (DC) is used and also physical synthesis flow is used in the project where we give floorplan as input to DC topographical for synthesis. ICC2 is used for PnR. Along with PnR runs, I have also explored DRC using caliber for base clean. I was assigned to do RDL routing for the IO's in this project.

Tool used (Development tools - H/w, S/w): Design Compiler - for synthesis

ICC2 - floorplan and PnR

Caliber - DRC

Cadence virtuoso - RDL

Synopsys lynx flow - Physical design flow

Objectives of the project: The main objective was to ramp up on flow for future projects and get deep insight into the work.

Major learning outcomes: Physical design flow, UNIX, TCL.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Even it is WFH, everyone in the team helped a lot so that we can understand the concepts properly. Work environment is good, managers and team members are friendly and co-operating.

Academic courses relevant to the project: VLSI design, CAD for IC design, Advanced VLSI design.

Name: DEVIKA S(2019H1230058G)

Student write-up

Short summary of work done during PS-II: Learnt VLSI physical design flow and applied that to one of the blocks assigned. The steps involved were synthesis, floorplanning, placement and routing(pnr). For synthesis, Design Compiler was used, ICC2 for pnr. The environment for executing the flow was given by Synopsys Lynx design system. DRC checks were done using Calibre and Cadence Conformal for LEC checks.

Tool used (Development tools - H/w, S/w): Synopsys lynx design system, ICC2, Calibre, DC, Conformal.

Objectives of the project: The main objective was to get acquainted with various stages in the PD flow and the tools used.

Major learning outcomes: Get to know various stages in the PD flow and the tools used.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: People were very helpful and friendly. They were always available to clear doubts.

Academic courses relevant to the project: VLSI design, CAD for IC design.

Name: KARTHIK G(2019H1230069P)

Student write-up

Short summary of work done during PS-II: The work was focused on quality checks on SoC. Sanity checks and lint checks were covered. Lint checking was the main area of focus. Initially, learnt how to run lint and to use the software for lint. Later, analyzed and debugged the errors. Time was also utilized to understand the architecture of the SoC which is required for checking the RTL and understanding violations.

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

Objectives of the project: Perform quality checks on SoC.

Major learning outcomes: Learnt to use the quality check tools, understood various violations that can typically occur in RTL design.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment was very pleasant and the team was very supportive. During the course of PS, the expectation was to ramp up on the required software to be used for checks and also to understand the architecture.

Academic courses relevant to the project: VLSI architecture(verilog).

Name: HITESH AHUJA(2019H1230070P)

Student write-up

Short summary of work done during PS-II: I was in the Mixed Signal IP design team of the firm. I did layout and schematic of various analog and digital blocks which included PLL, PoR circuit. Layout was in recent FINFET based technology (not revealing the technology library because of the company requirement), but it is the most recent. Moreover, I designed schematics in 16 and 40 nm technologies. I learnt Cadence virtuoso to deeper level and many of the NXP's in house tools for simulations.

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

Objectives of the project: To release IPs to be used in firm's inhouse microprocessors and to be given to the third party vendors.

Major learning outcomes: Very strong grip on intricate layout designing concepts. In circuit designing part, I got well experienced in how to analyze the data and tweak the parameters in order to meet the specifications.

Details of papers/patents: None

Brief description of working environment, expectations from the company: It was a great learning experience along with good stipend. Work is also not very hectic, but at the same time it keeps you occupied to a decent extent. Seniors are very helpful, they organized a systematic training for us to make us learn the layout designing and other things, it was smooth ramping up. Expectations are not very cut throat, the work can be done in the allotted deadlines.

Academic courses relevant to the project: Analog IC design, VLSI design.

Name: VIDHYA S(2019H1230081P)

Student write-up

Short summary of work done during PS-II: IP verification.

Tool used (Development tools - H/w, S/w): Cadence irun, Synopsys verdi.

Objectives of the project: Verification of IP.

Major learning outcomes: Verification flow, Testcase development, Debugging.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was great experience to work there. Even though, it was WFH situation due to pandemic, all the team members including my manager and mentors are very supportive and helpful.

Academic courses relevant to the project: VLSI test & testability.

Name: PENUKULA SAVINEETH(2019H1230533H)

Student write-up

Short summary of work done during PS-II: IP design flow was learnt on hands-on basis and then executed the flow on an assigned IP according to its requirements.

Tool used (Development tools - H/w, S/w): Linux, Spyglass, Design Compiler.

Objectives of the project: To perform IP qualification checks for digital IP's, synthesis setup script generation for newer technology nodes.

Major learning outcomes: IP design flow execution on a IP and its release.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: As the mode of work was WFH, the work atmosphere was mid paced and ambient. Interaction with each of the team members, mentors and managers was to my liking. Expectations of company would be same as any company i.e. complete work on time without any errors and for this the mentors and team would help whenever needed.

Academic courses relevant to the project: VLSI design, Analog design.

Name: ARJUN KANTILAL DESAI(2019H1230547P)

Student write-up

Short summary of work done during PS-II: My PSII is in validation team. So, few months I worked from office and than later WFH. During internship I worked in the lab. I worked on physical tools and later my work is on data analysis.

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

Objectives of the project: To detect any gliches and volatge level measurement in waveform.

Major learning outcomes: Data analysis, Validation flow.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Since I have worked from office for few months. So, I experienced office culture and met team members. The experience is great, all team members were so helpful and supportive.Even in WFH

situation, their support is good. So, over all internship experience is great in terms of industrial experience and for personal growth.

Academic courses relevant to the project: VLSI test & testability.

Name: JAGIRAPU NIKHIL REDDY(2019H1400544G)

Student write-up

Short summary of work done during PS-II: I have been assigned in a physical design department. Did power grid analysis like power consumption, IR drop, checking for shorts or missing vias in the power grid. I have published static power and rail analysis results for the blocks in the chip and identified a few issues in power grid connectivity.

Tool used (Development tools - H/w, S/w): Cadence voltus, Synopsis ICC-II, Redhawk.

Objectives of the project: To find the power grid robustness.

Major learning outcomes: Learnt how a power grid is present in a chip, what are different metal layers used as a power grid, power consumption, how IR drop happens in a power grid, reasons for IR drop and how can we try to reduce it.

Details of papers/patents: None

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

Academic courses relevant to the project: VLSI design.

Name: REDDEPPAGARI KUSHALA PRIYA(2019H1400556H)

Student write-up

Short summary of work done during PS-II: STA runs are performed at synthesis, placement, route stage for a specific block using Synopsys PrimeTime tool. The constraints are generated so that one can understand the timing requirements. The delays of the cells in the critical paths that are responsible for the timing violations are observed and try to optimize the design to meet the timing requirements.

Tool used (Development tools - H/w, S/w): Synopsys PrimeTime, Synopsys LYNX flow for STA.

Objectives of the project: To run STA for SoC/ block level and conforming the sanity checks.

Major learning outcomes: Performing static timing analysis for validating the timing performance of the block.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Great working environment with highly qualified working staff who are always ready to help and share their knowledge. My team has always been approachable whenever I was stuck at something. NXP has very good work culture.

Academic courses relevant to the project: VLSI design, VLSI architecture, VLSI test and testability.

Name: SHASHANK SUNIL AMATI(2019H1400557H)

Student write-up

Short summary of work done during PS-II: Got training on basics of IO and areas on which team is working. Silicon validation project was assigned and programing of USB 8452 using LABView part was given to me. Made the Vi for USB to send the test vectors to the test chip using SPI protocol. Implemented basic circuits and IO circuits in Cadence Virtuoso. Learnt ADE explorer and assembler from Cadence tutorials. Ran the simulations on all corners on MFIO cell.

Tool used (Development tools - H/w, S/w): USB 8452, LABView, Cadence Virtuoso, ADE.

Objectives of the project: Silicon validation and IO cell simulations.

Major learning outcomes: SPI protocol, IO design.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment was very good and healthy. Everyone was very helpful and supportive. The company was better than my expectations, no excessive work loads and good timings. Manager and mentor made my entry into work flow very seamless and easy.

Academic courses relevant to the project: VLSI design, Embedded systems.

PS-II Station:NXP Semiconductors, Noida

Faculty

Name: Prof. R.K. Tiwary

Student

Name: JAISWAL AKSHAYKUMAR SATISH(2019H1230053G)

Student write-up

Short summary of work done during PS-II: ATPG pattern generation, Simulation and debugging of Stuck-at, IDDQ and At-Speed fault models, Implemented an LBIST test point insertion flow, and wrote multiple Perl scripts for automation.

Tool used (Development tools - H/w, S/w): Mentor Graphics Tesson tool, Synopsys VCS, Verdi, etc

Objectives of the project: Design for testability.

Major learning outcomes: ATPG, Simulation, Debugging, Basics of MBIST and LBIST, Scripting.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: NXP provided excellent opportunities for learnings, the environment was super friendly and everyone was very helpful.

Academic courses relevant to the project: Design for testability, VLSI design.

Name: SHUBHAM(2019H1230075P)

Student write-up

Short summary of work done during PS-II: I started with basic linux commands and Perl scripts and tried to become used to it and then further as we moved forward I went on digging the basic DFT concepts. Further, we were allotted some assignments in the project which were related to optimization work. So before working on our assignments, we learnt the scan insertion tool flow and then followed by ATPG flow. As soon as these things were completed, we started working on our assignments and currently working upon it.

Tool used (Development tools - H/w, S/w): H/w -Tessent by mentor graphics.

Objectives of the project: Understand DFT techniques and optimization through fault grading.

Major learning outcomes: a) Basic linux commands and Perl scriptb) Scan insertion tool flowc)ATPG flow and fault grading.

Details of papers/patents: No papers published

Brief description of working environment, expectations from the company: NXP semiconductors is the giant semiconductor corporation and a dream company for many electronics engineers. So through our campus placements, I got the opportunity to be in this company. Initially when I started I thought there would be too much of work pressure and there would be no work-life balance (what we say in the corporate) but as soon as I joined, started working and interacting with mentor and manager they were so helpful and involved in understanding the doubts we have and sorting it. I will expect the same working environment as I will proceed further and become a full time employee.

Academic courses relevant to the project: Design for testability, VLSI design and CAD courses were really helpful in getting the concept.

Name: SAYAN BANERJEE(2019H1230076P)

Student write-up

Short summary of work done during PS-II: The first phase of my work is all about a brief overview of resets. The topic for reset design is surprisingly very complex but unfortunately it is poorly emphasized. Generally, Engineering schools do not adequately allude to detailing pitfalls of improper reset design. Improper reset design may lead to the problem of metastability as a result of which short circuit path may be formed between Vdd and ground which is undesirable as it can lead to huge short circuit powerdissipation. Here, I will discuss the correct coding style for reset design and what variables need to be set prior to running synthesis tool for correct synthesisability of reset, what is the need for reset tree, how to set synthesis parameters such that building of reset (like adding buffers to meet timing) tree becomes fully automated like that of building clock trees and how to handle resets of multiple clock domains. The second phase of my work is all about overview of static verification and synthesis tools. This section talks about the need of various static verification and synthesis tools in IC design flow (e.g. why lint why not traditional C type compiler), what is the importance of CDC tool and some of the checks performed by it, what are the steps involved in synthesis, based on what files synthesis tool performs the task of optimization, what goes as input and what comes as output in the synthesis tool, all these facts I addressed in the second phase of my work.

Tool used (Development tools - H/w, S/w): Spyglass(for Lint, DFT), Design Compiler(for synthesis), Questa(for CDC, RDC checks).

Objectives of the project: To get acquainted with reset trees and IC design flow.

Major learning outcomes: Learnt about reset synchronizers, merits and demerits of both synchronous and asynchronous resets in digital design and also the tools used in IC design flow.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment in NXP semiconductors is very professional, mentors are very helpful, I was assigned many assignments those are intended so that I can understand the tool in a better way.

Academic courses relevant to the project: Digital VLSI design, CAD for IC design.

Name: RAGHAV MISHRA(2019H1230526G)

Student write-up

Short summary of work done during PS-II: Worked in the SOC verification & emulation department, in the starting went through the basic verification training that includes writing testbenches in system verilog and UVM. Did coverage analysis and debug, hands on experience with VCS, Verdi tool by synopsys, then started working on the live project, contributed in completing the protocol model and ran testcases on ZEBU emulators, wrote Perl script then worked in Cache coherency verification.

Tool used (Development tools - H/w, S/w): VCS, VERDI, URG, ZEBU EMULATOR.

Objectives of the project: Ethernet & cache coherency verification.

Major learning outcomes: System verilog, UVM, testcases, how things work in a complex SOC.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is really good, everyone helps a lot. During internship, got assigned a live project which actually teaches a lot and tells you the difference with how practically things work and what you read in a book. This is one of the best companies to start your career in semiconductor industry.

Academic courses relevant to the project: Design test & testability.

Name: ANAND KUMAR SINGH(2019H1230542P)

Student write-up

Short summary of work done during PS-II: The project PS was divided in two parts,

1) Implementation of Physical Design Flow on a partition of a low power SoC

(I) Synthesis - (Tool : Cadence Genus) - Formal Verification of Synthesized Netlist

(Tool: Cadence Conformal Logic - Equivalence Checker (LEC))

(II) Floorplanning - (Tool: Cadence Innovus)

(III) Standard Cell Placement and Optimization - (Tool: Cadence Innovus)

(IV) Clock Tree Synthesis - (Tool: Cadence Innovus)

(V) Routing - (Tool: Innovus)

2) Hierarchical CPF (Common Power Format) Bring up of the same Low Power SoC - Captured the Power Intent of the SoC using CPF. There were three major stages of overall CPF bring up:-

(I) Understanding the Power Architecture (Power Domains, Supply Voltages, Power Shutoff Domains, Analog IPs and Hard Macros, etc which work on different supply sets and shutoff conditions).

(II) Creation of Top level Power Domains.

(III) Mapping of lower scope Power Domains to Top scope Power Domains.

Tool Used to Verify CPF - Cadence Conformal Low Power (CLP).

Tool used (Development tools - H/w, S/w): Tools - Cadence Genus, Cadence Innovus, Cadence Conformal LEC, Cadence CLP.

Objectives of the project: 1) Get hands on experience on physical implementation of an Architecture written in RTL by taking the architecture through various stages of physical design flow 2) Capture the power intent of the defined power Architecture.

Major learning outcomes: 1) Physical Design Flow2) Building up Power Intent of an SoC.

Details of papers/patents: Not Applicable

Brief description of working environment, expectations from the company: The work environment was excellent in terms of support that was provided from the teammates, project lead and the managers. All of them were quite helpful and reachable. One can definitely learn a lot from NXP if he/she is vocal enough and non hesitant to ask questions.

Academic courses relevant to the project: CAD for IC design.

PS-II Station:OfBusiness, Gurgaon

Faculty

Name: Prof. Preeti N.G

Student

Name: VIBHOR(2019H1030517P)

Student write-up

Short summary of work done during PS-II: The work primarily depends on the in depth knowledge of the crawler, as it is a huge project developed over a span of many years, with many features and functionalities. The primary work was of writing the crawling code, which not only requires in depth knowledge of crawler but also the website we are trying to crawl, the various authentication mechanism used by it, various HTTP request and different type of session that is maintained by server, all have to taken into account. Sometimes, Deep learning is required which is used to break Captchas, and that requires research sometimes to break tough Captchas. Also sometimes, new services are needed that we need to develop from scratch as no libraries are available or the tools are paid that get job done. So basically, I wrote crawling code for 20-25 websites, as well as developed helper tools like HTMLtoPDF converter for conversions of HTML to properly formatted PDF's, also wrote various REST api's for

different task's required.Attended workshops on new technologies and improving overall technical skills.

Tool used (Development tools - H/w, S/w): Java 8, REDIS, S3,MongoDB.

Objectives of the project: Contribute to the SPIDER project by writing crawling code of various websites, as well as improvements to the crawler and adding utilities and services.

Major learning outcomes: All this in-turn greatly improved my understanding of REST services and HTTP request, concurrent programming, use of producer and consumer, design patterns in practice, various deep learning concepts .

Details of papers/patents: NIL

Brief description of working environment, expectations from the company: The crawler is most important to the organisation as it produces the required data, that is used by other teams like back-end,front-end, to maintain their websites, design required services and provide them also, the contribution to the SPIDER project should boost the productivity of the other teams, as well as increase the amount of CORRECT data available to them,so code written should be such that full fill these tasks, so the PR's that we submit are rigorously tested, and attention to details are given, so as to not Ingest incorrect data. A high standard of coding practice is required by company.

Academic courses relevant to the project: Operating system, Design and analysis of algorithms, Deep learning concepts.

PS-II Station:One97 Communications (Paytm), Noida

Faculty

Name: Prof. Ritu Arora

Student

Name: ABHAY RAJ BAGUN(2016B2A40562G)

Student write-up

Short summary of work done during PS-II: I interned in Paytm as a backend developer. It was all in all a good experience as I learnt a lot. I would say my skill set expanded exponentially.

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

Objectives of the project: To learn about onboarding engine.

Major learning outcomes: Java, Spring boot, Hibernate.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Good working environment and is of 5 days / week.

Academic courses relevant to the project: Computer Programming.

Name: HIMANSHU GUPTA(2016B5A10650P)

Student write-up

Short summary of work done during PS-II: Due to confidentiality issue, I am constrained to provide any information but during this project I got to work with various software like Redis, Git, BitBucket, Postman Client etc.

Tool used (Development tools - H/w, S/w): Postman Client, Redis, IntelliJ, Git, BitBucket, Tomcat Server, Java.

Objectives of the project: 1.Analyzing routing engine working to build payments API for merchant for integrations and design dashboard 2. Analyzing key metrics to improve success rate for different bank and 3rd party gateways 3. Building highly scalable transaction processing platform for payments integrations with bank channels.

Major learning outcomes: 1.Learnt various skills & softwares like Postman, Redis etc. 2.Understood the workings of Backend development and the company 3.Got to work on a individual project.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Paytm has a nice working culture.A mentor will be assigned to you who will guide you throughout your internship. I got all the help I needed. I have accepted the PPO from Paytm and I will be continuing my work there and hopefully will be able to make some significant contributions to the company.

Academic courses relevant to the project: Computer Programming.

Name: SRISHTI GUPTA(2017A3PS0293P)

Student write-up

Short summary of work done during PS-II: 1. Automation: Test files corresponding to the 'Know your businesses module' were created to cover test cases based on JWT authorization and other positive as well as potential failure cases.

2. Junit testing: Junit testing was performed for the user preferences module, to increase the code coverage from 24 to 75%.
3. Development tasks were performed on the UPS and analytics APIs to add and modify several functionalities.

Tool used (Development tools - H/w, S/w): Java Programming, IntelliJ, Postman, MySQL, JIRA, Bitbucket, Tomcat, Kafka, Maven, Junit& Mockito.

Objectives of the project: Perform automation, Junit testing and development on 'Digital Merchant Experience' module.

Major learning outcomes: Automation, Junit testing and development.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Good learning opportunities for freshers and friendly environment. Good horizontal management and opportunities to work with multiple teams and projects.

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

Name: ASHUL GUPTA(2017A3PS0468H)

Student write-up

Short summary of work done during PS-II: Migration of APIs by creating an alternate pipeline of AWS.

Tool used (Development tools - H/w, S/w): IntelliJ, Bitbucket, Postman.

Objectives of the project: Migration of APIs by creating an alternate pipeline of AWS.

Major learning outcomes: Java, Test cases, Mockito, Junit, Maven, REST APIs.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: A very friendly environment with colleagues ready to help youngsters.

Academic courses relevant to the project: OOP, DSA.

PS-II Station:Oyo Rooms (Tech), Bangalore

Faculty

Name: Prof. Lucy Gudino

Student

Name: PRANAV JHAWER(2016B2A30663H)

Student write-up

Short summary of work done during PS-II: I was part of the OYO vacation homes team, working on the belvilla website. I worked on improving the UI of the web page and fixing bugs. I worked on the sort pop up option changing to a device based scroller. I then moved to the migration team, migrating the website to a React, Redux and Spring boot based stack. Implemented the use case of belvilla website on OYO rooms stack, incorporating the ES6 features.

Tool used (Development tools - H/w, S/w): VS Code as IDE, Slack for communication with team, Postman for testing APIs.

Objectives of the project: Project aimed to migrate the website to new stack.

Major learning outcomes: Learnt working on huge code base, incorporating the best coding practice.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: The colleague were helpful and everyone was motivated to do their work. I was given interesting tasks to work on every week. There were good amount of KT sessions that helped me understand the technologies used and learn the best coding practice.

Academic courses relevant to the project: OOPS.

Name: BAVISHI PRANIT BHAVESH(2016B3A30332P)

Student write-up

Short summary of work done during PS-II: I was part of the Customer Service Tech team as a backend intern, my work revolved around handling two of the products the team owns. One was adding functionalities to the company's chatbot (Yo!) and the other was to enable the option for users with multiple booking for a given day to confirm/cancel their pending status via Whatsapp. The team helped me lot in onboarding, understanding the product and gave me complete ownership of the end to end development of the second project.

Tool used (Development tools - H/w, S/w): Spring Boot, Redis, Kafka, SQL and MongoDB.

Objectives of the project: To improve user experience by allowing a user with multiple pending bookings to confirm his status via whatsapp, eliminating the need of a manual call. Other objectives included downscaling the team's underused resources to reduce overall costs.

Major learning outcomes: I developed a new feature on an existing product with full responsibility and ownership. Understood the software development lifecycle, writing production level code, professional communication and cross team requirements.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment was exceptional, despite it being work from home. The team has been welcoming in nature since day 1, they encourage asking more and more questions till you get accustomed to the product you will be working on. Interns are treated almost like employees(no bias of any kind) when it comes to daily standup meets, work delegation and responsibilities. Great place to grow and experience what SDE roles offer you and demand from you. The company expects you to pick things up fast and contribute along with helping you throughout.

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

Name: YASHAS CHANDRA(2016B4AA0430H)

Student write-up

Short summary of work done during PS-II: Maintaining the Belvilla website for all languages. Fixing bugs that were being reported by the product owners / business team and adding new features to the website.

Tool used (Development tools - H/w, S/w): HTML5, CSS, Javascript, PHP.

Objectives of the project: Maintaining and adding new features to the Belvilla website.

Major learning outcomes: Learnt how to manage a full fledged website which obtains revenues worth millions of dollars / year. Learnt how to quickly adapt to new technologies and ongoing tech migration, communication within and outside the team.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is very friendly. The senior developers try to assist everyone as much as possible. Reaching out to other team members and the team lead/manager is easy and everyone is very responsive. Everyone is expected to have some programming knowledge as we were given tasks from day 1 itself. Ownership will be given for some features in the later half of the internship so it is expected for us to get familiar with the codebase in the first couple of months.

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

PS-II Station:OYO Tech, Gurgaon

Faculty

Name: Prof. Ashish Narang

Student

Name: NIPUN GUPTA(2016B5A30559H)

Student write-up

Short summary of work done during PS-II: The projects I've done at OYO are mainly focussed to reduce the new property onboarding time and make the existing onboarding process easier, quicker and at the same time efficient. Being the part of supply onboarding team, which provides a technological platform to the Business Development Managers via our in-house Orbis App. Orbis is a property onboarding App used to keep a track of each stage of property onboarding from lead to live. All the deployments on each stack are handled using Jenkins. Kubernetes was used to perform the orchestration for all the services that the team

managed. Oftentimes, it was required to make the deployments on the dev cluster for the necessary developments.

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

Objectives of the project: Making the onboarding process of new hotels efficient.

Major learning outcomes: All the changes that I made in the contract were deployed on the production successfully. All the work done was duly tested before being deployed in the main line. Apart from this main project, I have also been the primary on-call of my team, which involves dealing with everyday issues related to the main repository of my team 'cams' or giving information or support to other teams in integrating with my team's repository.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The company has invested heavily in technology in order to keep pace with the competition. Company executives are enthusiastic about the massive potential of machine learning and artificial intelligence to disrupt the hospitality sector. Technology is central to OYO's operations and the company currently uses a combination of in-house and proprietary software to handle its business operations.

Academic courses relevant to the project: None

PS-II Station:OYO Tech, Hyderabad

Faculty

Name: Prof. Pravin Yashwant Pawar

Student

Name: AVINASH NARASIMHAN(2017A7PS0142H)

Student write-up

Short summary of work done during PS-II: The internship involved development and optimization of web APIs. The first 1.5-2 months went in learning about APIs, backend development using SpringBoot, frontend development using React and database development using PostgreSQL. I made a sample API project using these tools. After that the next 2-2.5 months involved working on any development requirements which came in from the business team, for example, some API was working slow and I had to find out the blocker, another task involved optimizing the images showed on the website. The last 2 weeks, I was shifted to the data engineering team where I was asked to expose some APIs and write a Python script for file transfer across servers.

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

Backend - IntelliJ and SpringBoot

Frontend - VS Code and React

Database - PostgreSQL

Objectives of the project: The project mostly involved optimising APIs and working around them only. It was not single project, there were multiple on-call issues and business requirements I had to work on, but the crux of all them was API development.

Major learning outcomes: The internship gave me huge understanding of how web applications and APIs work and how the SDLC operates. The process from developing code to deployment and then maintaining it was a huge learning outcome. It also gave me brief yet important view on how MNCs work as a whole.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The employees were very helpful and more than willing to help you out no matter how small or silly the doubt is. At the beginning, I was given lot of time to do my tasks, but as the internship

progressed, they expect you to take more responsibility and work more efficiently. They do help wherever you are stuck, but expect you to be more independent and accountable for your work.

Academic courses relevant to the project: OOPS and DBMS.

Name: T. NAGA SAI BHARATH(2017A7PS0209H)

Student write-up

Short summary of work done during PS-II: I was involved in multiple projects during my internship. Some tasks involved documenting some of the services by understanding the code and workflows. I worked on implementing a feature to ratings service where sub-group ratings were also added to the final rating of a hotel. I also learnt how to deploy the changes in the services on staging and production environment.

Tool used (Development tools - H/w, S/w): Jira, Jenkins, Rundeck, Sonarqube, Docker, Kafka, Spring Boot (Java) and Ruby on Rails.

Objectives of the project: I was not involved in a single project but was assigned small tasks in different projects. Mostly, I worked on documenting rating and task service. I was also involved in small development work

Major learning outcomes: Learnt how the workflow of development process would be - from pulling from Github, changing the code, fixing the bugs or optimising the code by getting feedback from mentor, pushing changes to staging and then to production environment.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Everyone is friendly and gave sufficient time to complete the tasks. I could easily take help from other senior

developers if stuck somewhere. There is not much pressure and company expects you to be fast learner.

Academic courses relevant to the project: Software Engineering, OOP.

Name: SIMRAN BATRA(2019H1030024H)

Student write-up

Short summary of work done during PS-II: I first learnt about basics of backend and then used that knowledge to implement in basic project. Then, I learnt react, implementation and make one hotel review application. After that I worked on fixing frontend issues.

Tool used (Development tools - H/w, S/w): Used IntelliJ, DataGrip, Postman, Android Studio, Xcode, Git and Github, Database-Postgres.

Objectives of the project: To understand basics of SpringBoot and react.

Major learning outcomes: Learnt SpringBoot and react, how to use Git and Github as well as debugging.

Details of papers/patents: Not applied

Brief description of working environment, expectations from the company: Working environment is very good and all are very supportive.

Academic courses relevant to the project: DBMS.

PS-II Station:PayPal - Analytics, Chennai

Faculty

Name: Prof. Akshaya Ganeshan

Student

Name: KESHAV SAINI(2017A3PS0240P)

Student write-up

Short summary of work done during PS-II: Data analytics to look for possible loss savings, chiefly from handling chargeback disputes better.

Tool used (Development tools - H/w, S/w): SQL, Python, Jupyter Notebooks, Big Query, Tableau, Excel.

Objectives of the project: Loss savings from policy making for disputes.

Major learning outcomes: Extensive knowledge on payments systems in card not present scenarios.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Virtual mode so mostly irrelevant. Team members and manager were friendly, provided a good environment.

Academic courses relevant to the project: Foundations of data science, Data mining, Probability and statistics and AI.

PS-II Station:PAYPAL, Bangalore

Faculty

Name: Prof. Uma Maheshwari

Student

Name: DHAIRYA V PAREKH(2016B2A80703H)

Student write-up

Short summary of work done during PS-II: Work at PayPal differs from team to team very widely. My team worked at emerging markets such as Japan, Mexico, Brazil etc. I was part of Brazil team in which my work involved developing internal API for merchant receivables, which can be used by frontend part of software or the developer for viewing the additional details of receivables. I also worked on building the dashboard for the same API's which was further deployed internal to PayPal.

Tool used (Development tools - H/w, S/w): Tech Stacks - Spring for Backend and React.js & Kraken.js for frontend and middleware.

Version Control- Git & GitHub and CI/CD Jenkins and GCP among others for deployment.

Objectives of the project: The complete project was utilised for internal PayPal PD.

Major learning outcomes: Various tech stacks, PayPal's business mode in the market and other skills such as presentation, communication etc.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: The working environment is pretty good at PayPal, there is no such specific time for the developers as our work was WFH purely but they expect you to deliver in a due time. You'll be responsible for your

deliverables from end-to-end with little help from your mentors. Overall, the people, the place, and the environment is top notch at PayPal.

Academic courses relevant to the project: DSA, OOP, Computer Networks, Software Engineering.

Name: NIBHRIT MOHANTY(2016B2AA0855H)

Student write-up

Short summary of work done during PS-II: Worked as an engineering intern in the Card Platforms team. Added small functionalities to backend services with end-to-end testing. Fixed OSS violations and pushed code to production. Had exposure towards basic automation tools. Worked with an Android application and integrated it with Google Firebase.

Tool used (Development tools - H/w, S/w): IntelliJ, GitHub, VSCode, Jenkins, Selenium WebDriver, Android Studio, Google Firebase.

Objectives of the project: The objective was to provide solutions for the tasks assigned, provide test results and make sure that functional tests were passing. There was lot of learning involved as well with small projects in automation and App development.

Major learning outcomes: Learnt about SDLC followed at the organization. Became familiar with lot of tools used and processes before pushing code to production. Learnt how automation can save time by reducing trivial tasks.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work environment is very good. The manager was very supportive and guided throughout the internship. Team members are very helpful and will try their best to help and point you towards

the right direction. You are expected to learn and adapt quickly. Be proactive and look/ask for learning resources that you require.

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

Name: A. SRI SAI GANESH REDDY(2017A7PS0030G)

Student write-up

Short summary of work done during PS-II: During this internship, I developed batch application using Spring batch framework. One of the batch jobs involved transferring accounts from one database to another database and also writing to a file and uploading the file to an sftp server. I wrote unit tests using Junit framework along with Mockito framework to mock collaborators and functional tests using TestNG framework for the jobs I developed. One of the jobs I developed was deployed to production and its performance was slightly better than existing jobs because of the scaling and parallel features of Spring Batch I used. More specifically, I used local partitioning where master step produces many worker steps in parallel in different threads. I wrote a partitioner that uses paging logic to divide the work among worker steps, this dramatically increased the performance of the batch job.

Tool used (Development tools - H/w, S/w): Java, Spring, Spring Batch, Junit, Mockito, TestNG.

Objectives of the project: Implement batch jobs using Spring Batch.

Major learning outcomes: Learnt about Java, and workings of Spring, Spring Batch. Understood that testing is crucial part of developing code. Learnt about scaling and parallel processing which increases the performance incredibly.

Details of papers/patents: Spring framework documentation.

Brief description of working environment, expectations from the company: The working environment in PayPal was smooth. I got enough time to learn different technologies and used them without hiccups. Weekends are off, PayPal provides many learning resource for free to develop your skills. Timings are based on the team you are assigned.

Academic courses relevant to the project: OOP, DBMS, Computer programming.

Name: PRAVIN R(2017A7PS0108G)

Student write-up

Short summary of work done during PS-II: Built a test tool website using React and NodeJs for improving the functional testing process of Java programs. The website allows user to select and run a subset of functional tests in a cloud environment and view their execution details & log files in an interactive webpage. The website also provides an option to rerun the failed test cases and updates execution details. Also, built Java listener program that collects and sends all important test execution details to the DB which is later displayed in the website.

Tool used (Development tools - H/w, S/w): NodeJs, React, Java, MySQL, GCP.

Objectives of the project: To build a testing tool (webapp) to imporve the funcional testing of Java services.

Major learning outcomes: Learnt to build website using React frontend, NodeJS backend and intergrate DB, REST connections with other services. Learnt to work with Springboot Java application and testing framework.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Friendly and helpful employees. Easy to approach anyone for help. Mentors are assigned to help interns with

any tech/non-tech problems. Interns are expected to quickly learn and adapt to the tech stack required for the project assigned to them.

Academic courses relevant to the project: OOP, DBMS.

PS-II Station:PAYPAL, Chennai

Faculty

Name: Prof. Akshaya Ganeshan

Student

Name: SRAJAN DADHICH(2016B1AA0735G)

Student write-up

Short summary of work done during PS-II: Worked on the development of Data Application Life Cycle Management (DataALM) on-premise platform to optimize the costs, training times and migrate the platform to the public cloud.

Tool used (Development tools - H/w, S/w): React JS, Postman, Git, Linux CLI.

Objectives of the project: DataALM is an enterprise platform used by data developers to run big data queries and to come up with accurate business insights. The project was aimed to develop DataALM platform to migrate the platform to the public cloud. The project had significant improvements in minimizing operating costs for the team, faster deployments, and an easier onboarding experience for the customers.

Major learning outcomes: Learnt about major front end web development tools - HTML,CSS, React JS.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The company follows scrum planning, bi-weekly tasks are assigned along with timelines to complete them. It helps in visible growth, similarly sprints are set for about 15 days. People are helping in nature. They consider interns as full time employees and give similar amount of work to the interns also.

Academic courses relevant to the project: C language, OOP.

Name: ARUSHI CHOUDHARY(2016B2A80872P)

Student write-up

Short summary of work done during PS-II: Ideas compilation lets us see just what customers need, from live conversations with clients to product reviews from end-clients. This platform will be dedicated to user-generated ideas, feedback, content, reviews, and other information regarding the brand. They also give customers a sense of what other customers have requested, along with our team's responses. Also, feedback can provide the leadership team with perspectives that can help them chart a course ahead for every sector of their company, from service to UX to customer service. Feedback is the best way to keep the audience at the center of your efforts. I designed a portal for collecting ideas and feedbacks from the customers using MERN Stack. A MERN Stack is a combination of four technologies: MongoDB, Express JS, React JS, and Node JS.

Tool used (Development tools - H/w, S/w): MongoDB, Express, React, Node JS.

Objectives of the project: To design an ideas and feedback portal.

Major learning outcomes: I learnt to create website using MERN Stack.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Overall working environment is nice. Everyone is allotted two mentors, one for the project and other one for the fun activities. People are helpful and approachable.

Academic courses relevant to the project: C language, OOP.

Name: SHREYASH SHUKLA(2017A7PS0114G)

Student write-up

Short summary of work done during PS-II: Worked in risk department of dispute resolution team. Improve efficiency of dispute resolution process in PayPal by upgrading the storage and retrieval of customer disputes and other information from external API in a reactive and non blocking manner.

Tool used (Development tools - H/w, S/w): Spring Reactive, Apache Kafka, Java, Mockito, TestNG.

Objectives of the project: Efficient storage/ retrieval of customer disputes.

Major learning outcomes: Backend development, Java, Spring, Kafka, Databases, OOP, Unit testing.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Nice working environment. Helpful and motivating teams. You are given enough time to get familiar with codebase and tech stack.

Academic courses relevant to the project: OOP, Databases.

PS-II Station:Pfizer, Chennai

Faculty

Name: Prof. R Bharathi

Student

Name: SAILI SACHIN JAGADE(2019H1460109H)

Student write-up

Short summary of work done during PS-II: Post approval classification changes in US, Canada& EU:To compare and understand the post approval changes in 3 regions i.e. US, Canada and Europe. Post approval changes are changes made to an already approved pharmaceutical product. These changes can be administrative or chemistry manufacturing and controls (CMC) changes, which need prior approval from the concerned Regulatory Authority (RA) if the proposed change is considered to have an impact on the safety, efficacy and quality of the drug. Post approval changes are vital part of the pharmaceutical product life cycle management. There are many reasons for making changes to pharmaceutical products after the original regulatory approval is obtained. These changes are done due to changing needs, new findings and for continuous improvement. Depending on the degree of impact, some changes may simply need the company to document the change being evaluated. Manufacturers should consult the guidance documents specific to the region in order to follow the proper compliance procedures.

For US: Changes to an approved NDA or ANDA guidance provides recommendations to holders who intend to make post approval changes in accordance with section 506A of the Federal Food, Drug, and Cosmetic Act (the Act) and 21 CFR 314.70, to CDER.

For Canada: A post-NOC change is pursuant to section C.08.004 of the Food and Drug Regulations.

For Europe: A Post Approval Change Management Protocol (PACMP) was introduced in EU through variations classification.

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

Objectives of the project: To determine the types of post approval changes in three regions i.e. US, Canada and EU and outline the differences in changes. To understand the approval strategy and various terminologies. To understand the classification of reporting categories and determine the impact of change on the safety, efficacy or quality of a new drug.

Major learning outcomes: 1. To describe the reporting categories in 3 regions effectively 2. To list the various case studies/examples of post approval changes under each reporting category 3. To understand requirements of various regulatory agencies.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: WFH since start of PS i.e. January 2019. Polite, helpful and respectful colleagues and managers. Training presentations were very helpful and insightful.

Expectations: 1. Display leadership abilities through special projects and tasks 2. Contribute to the team 3. To fulfil the company's commitments to patients.

Academic courses relevant to the project: Quality assurance and regulatory affairs.

Name: PRERANA RAJENDRA SALUNKE(2019H1460583H)

Student write-up

Short summary of work done during PS-II: My project focused on meticulous understanding of life cycle management of the drug products marketed in Australia and understanding the TGA(Therapeutic Goods administration) perspective. It predominantly involved understanding the registration pathways, requirements and prerequisites for the same. Understanding the scope and objective of the guidelines and regulatory authority. Reviewing the types of variations followed by apprehension of the conditions and data requirements for the variation. The methodology adopted for the project is predominantly a literature survey from renowned articles and regulatory agency websites.

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

Objectives of the project: To understand in depth the basic acts, regulatory processes, unique regulatory requirements, datasets and post approval changes for the Australian market through extensive study of the guidelines.

Major learning outcomes: The project gave insights into unique regulatory requirements, complexities of the approval processes, life cycle management, and post-approval changes.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Pfizer is an excellent organization with positive working environment that increases productivity and fosters growth. Knowledge sharing meetings and seminars helped to uplift the level of understanding of the subject. The team leads and the guides are very supportive and encouraging. The company focuses on thorough understanding and knowledge gain. The experience of working at Pfizer was immensely rewarding and helped me dive deep in the field of regulatory.

Academic courses relevant to the project: Quality assurance and regulatory affairs, Dosage form design, Biostatistics and Quality by design.

Name: MANISHA PARAMHANS YADAV(2019H1460586H)

Student write-up

Short summary of work done during PS-II: I was allotted a project to study about the regulatory filing pathways for generic drug products in Europe. This included studying the guidelines from the official websites of EMA and various other EU websites to extract the information. Detailed study about four different pathways for market authorisation of generic drugs in Europe were studied.

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

Objectives of the project: To understand various marketing authorisation routes in Europe. To study the medicines regulatory network in Europe and post Brexit filing pathways in UK.

Major learning outcomes: Various guidelines related to market authorisation for different filing pathways of generic drug products in Europe.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Pfizer has a good working environment with great facilities and helpful mentors. They always keep motivating and are very supportive.

Academic courses relevant to the project: Quality assurance and regulatory affairs.

PS-II Station:PharmaACE, Pune

Faculty

Name: Prof. R. Bharathi

Student

Name: BHANSALI MITESH VINOD(2019H1080534P)

Student write-up

Short summary of work done during PS-II: PS-II at PharmaACE began with 5 weeks worth of extensive training starting with basic tools like MS PowerPoint, Excel and continued with deeper understanding of forecasting, secondary research, market assessment, chart audit and lot more. Later, We were assigned to team that caters a specific client. During my time as a team

member I underwent another training session to better understand the practical work and client expectations. I performed multiple analysis on large databases, prepared presentations as per client's needs and contributed to forecast model development and upgrades. Almost everything we learnt in the initial training was put into use as I worked for the client as part of the team.

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

Objectives of the project: To understand the psoriasis market worldwide and formulate relevant forecast assumptions.

Major learning outcomes: Forecasting methodology in pharmaceutical industry.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Done PS-II from home, hence the physical environment is unknown to us. However, the environment created by our peers and seniors during office hours is favorable for a curious learner. All kind for help on legal/ financial/professional fronts are available at ease.

Academic courses relevant to the project: Pharmaceutical Administration and Management, Clinical Research.

Name: KRITIKA GOSWAMI(2019H1460169P)

Student write-up

Short summary of work done during PS-II: I am closely involved in the forecasting team at PharmaACE analytics, Pune. My work majorly involves forecasting the sales, demand and revenue of the US based client's pharmaceutical product. I also attended client meetings and gain valuable insights from there. It helps me understand the business insights more closely.

Tool used (Development tools - H/w, S/w): I mostly work on MS Excel and MS Powerpoint.

Objectives of the project: To learn how the consultancy firms work. Importance of forecasting and how it can influence important decisions.

Major learning outcomes: I learnt lot about how the consultancy firms work. Importance of forecasting and how it can influence important company decisions.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: PharmaACE is a very nice company. All my colleagues are really supportive and helped me gain the maximum out of it.

Academic courses relevant to the project: Pharmaceutical Administration and Management.

PS-II Station:Pilani Experts Technology Labs Pvt. Ltd., (TapChif), Bangalore

Faculty

Name: Prof. Saleem Bagewadi

Student

Name: MILAN JOB JOSE(2017A4PS0160G)

Student write-up

Short summary of work done during PS-II: The old project was to deploy unacademy Pro for courses in sales and full stack development which will have cohort based live classes as a form of instruction. I helped in lead generation, curriculum development and workflow management

for the sales course. An upcoming software, ClickUp, has been used for workflow management among the multiple teams of the company. Naukri premium was used to hire freelancers on contract basis for multiple posts. Workflow management for freelancers who have been hired as content writers, designers and editors were set up using ClickUp.

Tool used (Development tools - H/w, S/w): Clickup, Google Sheets, Linkedin Sales Navigator, Naukri Premium.

Objectives of the project: Launch Relevel within deadline with few bugs.

Major learning outcomes: Hiring, Lead Generation, Sales, Website Testing, Market Research.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: Company was amazing. Expectations from company are not huge. Just do the work given to you without errors. There are people to help even if you make some minor errors.

Academic courses relevant to the project: OOP, Databases.

PS-II Station:PNC Infratech, Agra

Faculty

Name: Prof. Mahesh K Hamirwasia

Student

Name: ADWAIT DHARMENDRAKUMAR DUBEY(2019H1440113P)

Student write-up

Short summary of work done during PS-II: Project Intern at '4-Laning of Aligarh Kanpur Highway Package V, from Mitrasen to Kanpur on Hybrid Annuity model under Bharatmala Pariyojana.

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

Objectives of the project: Highway Construction.

Major learning outcomes: Planning and Monitoring of Execution of Highway Project.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment at site office was good, with all engineers and managers being cooperative and offered continuous guidance.

Academic courses relevant to the project: OOP.

Name: KUNAL SAHU(2019H1440622P)

Student write-up

Short summary of work done during PS-II: PNC Infratech is a construction, development and management company. Mostly works on Highway construction with few projects on Airport Runway development and Industrial area development. I joined during very early phase of the construction of 8 Lane expressway. During the initial phase of the internship, the learning curve was steep. I used to visit different departments. At the end, I continued with Highway Department.

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

Objectives of the project: Construction of 8 lane expressway.

Major learning outcomes: Learnt basics of road construction.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The camp was set in a small village in Gujarat. Everyone in the camp was very friendly and supportive. From my co-worker to manager, everyone helped me in the best possible way they can. My doubts were cleared instantly and used to learn something new every day. Since, it was set near a small village, it lacked various basic needs. Being a student from Infrastructure Engineering and Management, I was hoping for more planning and management related work, but the company majorly deals with the construction of the highway only. The planning division was mainly busy with making bills.

Academic courses relevant to the project: OOP.

PS-II Station:Postman, Bangalore

Faculty

Name: Prof. Ankur Pachauri

Student

Name: MAYANK JAIN(2017A7PS0179P)

Student write-up

Short summary of work done during PS-II: Worked on postman App's core functionality i.e. sending request. Got opportunity to work on both frontend and backend. Started with fixing bugs and moved on develop new features like pdf preview functionality in the App. Most of the work is

related to issues and feature requests on postman's Github account. The work is same as what a full time employee gets and you get to see your features and fixes in the actual production App. It provides really good learning opportunities in terms of technical knowledge, best engineering practices and general day to day working in a software company.

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

Frontend - React

Backend - NodeJs

Testing - Mocha, Sinon

General day to day working - Jira and confluence

Objectives of the project: Work on core functionality of postman by fixing bugs and adding new features.

Major learning outcomes: Learnt full stack development in Javascript.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Particular to my team - runtime squad. A great working environment if you truly want to work. You get good opportunities and responsibilities. Expect to have high learning curve in the start as you will be directly told to work on the production App, though you will be given time and support by seniors to learn whatever you dont know. Expect good quality work which will be used in production by the company. Average work life balance, I personally had lot of work but was never denied leaves or time off if asked for. Expect less number of meetings and mostly in work hours only. The team is helpful, your opinions matter, and they do encourage learning even outside of work.

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

PS-II Station:Qualcomm India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Rejesh N.A.

Student

Name: ANKIT KUMAR SAHOO(2017AAPS0303H)

Student write-up

Short summary of work done during PS-II: TLM (transactions level modelling) runs take very significantly less time than the RTL runs. To handle the steadily expanding complexity of system-on-chips (SoCs) and time-to-showcase pressures, the design abstraction has been raised to the system level to build plan efficiency. This more significant level of abstraction created huge interest in transaction-level modeling, synthesis, and verification.

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

Objectives of the project: Representative inputs for RTL and TLM performance simulation and correlation.

Major learning outcomes: Cache organisation and protocol verification.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The team is goal driven. Depth of knowledge on our field is tested during the presentations. Frequent presentations with the manager can be expected.

Academic courses relevant to the project: Computer Architecture.

Name: AKKENAPALLY KRISHNA CHAITANYA(2019H1030011H)

Student write-up

Short summary of work done during PS-II: I read about Machine Learning compiler named GLOW, which was introduced by facebook in 2018 so its major purpose is to accelerate the performance of deep learning frameworks on different hardware platforms and worked on some stuff in it like knowing what all components GLOW consists of, how code flow run through GLOW, about cross compilation and how to add backend etc.

Tool used (Development tools - H/w, S/w): An Editor to run .cpp and Python files, Cscope, Ctags.

Objectives of the project: To integrate GLOW with their own backend.

Major learning outcomes: Learnt greatly about Deep Learning.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The environment was good and the team is very supportive. The task assigned was bit challenging because it was entirely new and slowly emerging.

Academic courses relevant to the project: Computer Architecture.

Name: KAVIKONDALA VENKATA SAI SANKALP(2019H1030120H)

Student write-up

Short summary of work done during PS-II: I was part of ADK development team in Qualcomm's voice and music department. ADK's are similar to SDK's and they are used to build

earbud or headset applications for qualcomm's audio chipsets. I got work on fast pair and swift pair features developed by google and microsoft respectively which were integrated into qualcomm's audio products by my team.

Tool used (Development tools - H/w, S/w): Perforce, Earbuds H/W Dev boards.

Objectives of the project: Build earbud or headset applications using ADK.

Major learning outcomes: Bluetooth Classic, Bluetooth Low Energy, ADK development Process, Debugging, Porting applications.

Details of papers/patents:NA

Brief description of working environment, expectations from the company: Working environment was really good, mentor and my manager were really helpful. You are given enough time to learn about the work that is being done in the team.

Academic courses relevant to the project: Digital Logic Design, Computer Architecture, Operating Systems.

Name: MANVITHA G(2019H1230041H)

Student write-up

Short summary of work done during PS-II: My work involved understanding debug infrastructure and helping in better automation of debug ips. I learnt programming languages Perl and Python while working on scripts. I had to run flows to find out if anything goes wrong in the RTL. I also worked on analysing trigger interfacing on SoC for hardware saving which can be achieved by reducing number of triggers.

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

Objectives of the project: Automation of Debug IPs and detailed analysis of Embedded Cross Trigger.

Major learning outcomes: Scripting, RTL coding, Design flows, Version control.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was great. Everyone is very helpful. Inspite of the internship being online I got an opportunity to learn lot.

Academic courses relevant to the project: Advanced VLSI Architecture, Advanced VLSI Design.

Name: PHARANDE NEIL CHANDRAKANT(2019H1230056G)

Student write-up

Short summary of work done during PS-II: Direct programming interface between System Verilog and Python.

Tool used (Development tools - H/w, S/w): Synopsys VCS Mentor VSIM.

Objectives of the project: To establish a communication between System Verilog and Python.

Major learning outcomes: Clock domain crossing, ARM BUS protocols, ARM SMMU architecture.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment was perfect following the support of managers and mentors.

Academic courses relevant to the project: VLSI test and testability.

Name: ABHAY RAJ(2019H1230077P)

Student write-up

Short summary of work done during PS-II: Learnt SV/UVM testbench structure and environment for verification and AMBA 5 CHI protocol basics. Also learnt scripting languages for unix environment i.e. Python and Bash. Created an automation framework for quickly performing verification of basic tests by developing and reusing scripts.

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

Objectives of the project: Scripting and automation of performance verification.

Major learning outcomes: Verification testbench structure, SV/UVM verification flow, Python scripting, Infrastructure blocks and CHI protocol.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment was very good. My mentor and manager was always available for me if I had any doubts or if I was stuck anywhere, the team supported me in developing the scripts. They involved me in all the project activities and we had daily meeting where my tasks were assigned. They also had presentation of what I have learnt during internship. The company expects us to have good basic knowledge and provided necessary training for learning new skills. Even in WFH environment, lots of learning series were organized by the company.

Academic courses relevant to the project: VLSI Design, VLSI Architecture, Advanced VLSI Architecture.

Name: KUBER NATH DERASARI(2019H1230078P)

Student write-up

Short summary of work done during PS-II: I have correlated latency between RTL and TLM.

Tool used (Development tools - H/w, S/w): Verdi Tool. Language Used: Pearl, System Verilog.

Objectives of the project: Performance analysis of memory.

Major learning outcomes: Architecture learning of memory management unit.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment was very much helpful. Lot of support was provided by colleagues and lot of learning outcomes were there.

Academic courses relevant to the project: VLSI Design, VLSI Test and Testability.

Name: MOHAMMED OBAID OMAIR(2019H1230535H)

Student write-up

Short summary of work done during PS-II: My project is related to power estimation and IOP (Operational current) analysis. I need to take the patterns generated by ATPG team for a particular core of design and run the VCS simulation by dumping the hierarchies for which I

need to do power analysis. The files generated after simulation will be loaded in Verdi tool to observe the patterns (and also we can detect if there is any bug or fault in the design) and select a timing window for specific pattern. For that timing window, run the power analysis commands in PTPX (Prime Time Power Analysis-synopsis tool) tool which gives the final power summary report.

Tool used (Development tools - H/w, S/w): Linux, Verdi tool, PTPX tool and Perl scripting.

Objectives of the project: Power Estimation and IOP analtsis of VLSI SOC design.

Major learning outcomes: The current project made me to understand the correlation between theoretical power analysis techniques and the practical techniques used in industry today. Working with DFT SoC power analysis team made me to explore ways where many tools and techniques are used and given me exposure to some of the most productive IC design tools. The experience got till now as a part of DFT team has been overwhelming.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment in the company is satisfactory. We got our own laptops from the company to work on. My mentor was well experienced person, he always used to help and guide me if I got stuck somewhere in the work. He even taught me how to become a good mentor and how to approach other teams to fulfill our project requirement. Apart from the technical learning, this internship provided an 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.

Academic courses relevant to the project: VLSI Design, VLSI Test & Testability.

Name: SUNITA PANDA(2019H1230541P)

Student write-up

Short summary of work done during PS-II: Learnt scripting languages like Perl, Python, Shell, synthesis activity of ASIC design using design compiler tool.

Tool used (Development tools - H/w, S/w): Design compiler by synopsis.

Objectives of the project: To learn the synthesis process and its stages. To integrate design for testability step in the current synthesis flow.

Major learning outcomes: Learnt scripting languages like Perl, Python and Shell. Learnt synthesis activity of ASIC design using design compiler tool implementing different synthesis flows. also learnt about design for testability.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is quite well co-ordinated. Teammates are always approachable. Manager is supportive and understanding.Expecting a smooth work life at Qualcomm and great learning experience from that.

Academic courses relevant to the project: VLSI design, CAD for IC design, advance VLSI design, VLSI testing and testability.

Name: RISHABH TYAGI(2019H1230551P)

Student write-up

Short summary of work done during PS-II: I am in DDRSS design and power team of Qualcomm. After developing RTL, there is RTL qualification flow to make sure it's quality. I

worked on RTL qualification flow automation by developing Python scripts and Shell scripts. And for the formal verification, some scripts are developed by me in Perl. Apart from this, while running tools, we have waiver file to waive some errors. Waiver automation is also the part of my intern project.

Tool used (Development tools - H/w, S/w): Python, Perl, Shell script, Spyglass tools.

Objectives of the project: Automation of RTL qualification flow, waiver automation.

Major learning outcomes: Perl, Python, Shell scripting, Spyglass tools.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work environment is really great. All the people in team is helpful and help me to learn the flows of Qualcomm.

Academic courses relevant to the project: VLSI design, VLSI architecture, CAD for VLSI design, VLSI test and testability.

PS-II Station:Qualcomm India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Rejesh N.A.

Student

Name: TRISHNA PAL(2019H1240130H)

Student write-up

Short summary of work done during PS-II: Development and testing of software based implementation of coherent signal demodulation of GNSS signals. Analysis of various parameters that affect the performance of the system and testing using live satellite signals.

Tool used (Development tools - H/w, S/w): C/C++, Matlab, Qualcomm tools.

Objectives of the project: Designing framework for efficient demodulation of GNSS signals.

Major learning outcomes: Knowledge of satellite communication systems, efficient coding skills, testing and analysis of codes.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Helpful and friendly mentors to guide on everything, efficient virtual onboarding by HR.

Academic courses relevant to the project: Satellite Communications, Digital Signal Processing, C coding.

Name: JAYAKRISHNAN M(2019H1240538H)

Student write-up

Short summary of work done during PS-II: The continuing evolution of technologies in the automotive industry has led to the development of the so-called Advanced Driver Assistance Systems (ADAS). ADAS is the term used to describe vehicle-based intelligent safety systems designed to support the driver, with the aim to significantly improve his safety, and the driving safety in general. ADAS work with the support of software, hardware and firmware solutions developed on technologies like RADAR, LIDAR, vision and image processing, or AI to help the driver for a safe and smooth driving experience. Out of all the technologies used in ADAS, vision and image processing are the predominant method used by ADAS providers for

understanding the on-road environment, detection of objects, and taking corrective driving decisions. A set of full-HD cameras installed on the sides of the vehicle help in capturing the objects all around the vehicle for further analysis and processing by the ADAS system. The project envisions to the computer vision related application in the low-end hardware implementation based on CPU/DSP architecture. The developed library must be tested in situ with the flow of the system.

Tool used (Development tools - H/w, S/w): Microsoft Visual Studio for C/C++ development, PyCharm for Python scripting, Qualcomm Proprietary tools.

Objectives of the project: The following are the key objectives for the project duration. Developing the test application for Compute SDK latest versions. Developing a benchmarking tool to compare the performance aspects. Developing a downscaling and colour conversion tool file based (camera dumps) for linear camera. Focused on the verification, validation, and performance benchmarking of compute SDK APIs in CPU as well as in DSP. Creating the input test vectors for different image resolutions (generic images and camera frame dumps). Migrating the test strategy into the automation framework. Working with the team for successful Software Product (SP) delivery. Developing the work culture in lining with the organization.

Major learning outcomes: QUALCOMM Package Manager: Flashing, Image visualization, Core dump analysis, Change Request tracking, Test planning and job submission, Code review.

Programming Languages: Python3, C/C++.

Debugging tools: GDB, T32, Eclipse.

Version Control: Git, Perforce.

SDK: Microsoft Visual Studio, PyCharm Community Edition, Hexagon DSP.

Technology: Digital Image Processing and Computer Vision.

Tools: MATLAB Image Processing Toolbox, MATLAB Computer Vision Toolbox, OpenCV.

Details of papers/patents: Not applicable.

Brief description of working environment, expectations from the company: Expectation: The organization expects to have good knowledge in basic C programming and Python scripting. The debugging skills and validation of the modules through developing the application was the other expectation throughout the project.

Work environment: The work environment at Qualcomm is lively throughout the period from trainings to live projects even though it is WFH. The project schedules are quite short but throughout the period, support from the team was quite well. The remote working environment and hardware support was really helpful. The reimbursement for the internet charges is an added advantage. The global training, yoga session and other supportive sessions for the employee well being is really helpful.

Academic courses relevant to the project: Embedded System Design, Real time Systems, Hardware/software co-design, Probability and Random Process, Digital Signal Processing.

Name: CHINTAKUNTA RATNA KUMARI(2019H1400555H)

Student write-up

Short summary of work done during PS-II: The features developed by the developers must be manually tested for valid positive and negative scenarios to validate their intended behavior before providing it to the testing team. Instead of validating manually, the testing efforts to validate each test case are automated using Qualcomm proprietary Python framework. Finally, a feature report is generated which contains information about passed/failed test cases and their reason for failure. During the internship, I worked on bringing up the framework on revision boards A and B and learnt the framework. Then, understood the features (chip to chip and diagnostic feature) and implemented automation to validate all positive and negative test cases using an automation framework for these features.

Tool used (Development tools - H/w, S/w): Teraterm, QFIL, QPST, Filezilla, Pycharm IDE, Notepad++, Eclipse, LinuxView.

Objectives of the project: Work on enabling chip to chip communication on the ADAS hardware platform that has PCIe switch, endpoints and other components.

Major learning outcomes: Learnt system architecture of the project, PCIe technology, Python automation framework and how to develop scripts to implement testcases in framework and trigger them.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Great working environment with highly qualified working staff who are always ready to help and share their knowledge. Regular interaction with mentor and manager helped to improve skills. The company expects to have a clear understanding of basic concepts that has dealt with in the academic curriculum and if not, it is expected to put in extra efforts to understand those concepts (at least which are related to current working project).

Academic courses relevant to the project: Embedded system design, RTOS, VLSI architecture, data structures and algorithms, operating system.

Name: TEJAS B S(2019H1400583P)

Student write-up

Short summary of work done during PS-II: The project I worked was functional coverage exclusion automation for the AXI protocol. The scope of the project is to automate this functional coverage exclusion for AXI protocol, using the dependency table and automation script. There are two type of cover-groups, excludable and non-excludable based on the design parameters. The ones which are excludable are the ones that are invalid for the current design configuration, so a Python script was written which looks if the condition is satisfied based on the design parameter mentioned in the dependency table, and an exclusion file is generated. In the second phase test cases and sequences are written to cover the remaining cover groups.

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

Objectives of the project: To automate the functional coverage exclusions based on design parameters, eliminate the repeated manual effort for all NoC DV closures.

Major learning outcomes: Learnt AXI 3/4 spec, System Verilog functional coverage, UVM, Python scripting, Synopsys VIP.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I worked from home the whole internship, even though office environment was missing, teammates were more than happy to welcome and provided good support and mentorship. On a whole, it was very good atmosphere with a lot of learning and positive energy. The expectation of the company is to have open minded to learn new skills and problem solving ability.

Academic courses relevant to the project: VLSI design, Embedded system design, VLSI architecture.

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

Faculty

Name: Prof. Koneru Gopal Krishna

Student

Name: MULUKUTLA VENKATA AADITYA(2017AAPS0123H)

Student write-up

Short summary of work done during PS-II: My first project was Power Management IC (PMIC) Checklist Extraction, Compliance and Automation. I had to perform S-parameter, loop impedance, loop inductance and DCR extractions for PMICs on high-speed board designs.

These extractions and simulations are required to ensure power and signal Integrity for the high speed signals on the boards. Different tools like Cadence Sigrity PowerSI, PowerDC, Keysight ADS & ANSYS were used. Performing these simulations consume significant time and manual effort. To overcome this, an automation tool has been developed using Python and TCL. My second project was based on Decoupling Capacitor Optimization for Power Distribution Networks. For this, I worked on Cadence Sigrity OptimizePI tool by which we can optimize decoupling capacitors placement with respect to performance, cost and area.

Tool used (Development tools - H/w, S/w): Cadence Sigrity PowerSI, PowerDC, OptimizePI Keysight ADS, ANSYS, Python, TCL.

Objectives of the project: Learnt PMIC checklist simulations and suggest improvisations in the workflow, proposing solutions for Decoupling Capacitor Optimizations.

Major learning outcomes: High-speed board design, Power Integrity, Signal Integrity, PDN Impedance, Automation tool development.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment was good at Qualcomm. My mentor and other team members were friendly and helpful in execution of all my tasks. The senior members encourage to come up with innovative methods and solutions to solve problems. The company expects the interns to have basic knowledge in all domains of electronics (digital, analog, communications). The candidate should also be well versed with basic programming skills, to automate certain tasks.

Academic courses relevant to the project: Digital design, Microelectronic circuits, VLSI, EMFME.

Name: DEWAN KIRTI ANIL(2019H1030018H)

Student write-up

Short summary of work done during PS-II: I was part of the LTE modem ML1 team which was responsible for reducing the power consumption by modem chips. Till mid-sem, I was ramped up with the theory part of LTE, modem architecture, ML1 layer structure and functions to understand the technology in depth. Post mid-sem, I was assigned different types of UE crashes to understand and analyse the various possible reasons behind the crash. I was also asked to understand the CDRX/eDRX technology in depth. Near the end of internship, I was also looped in the internal QC scripts that were being developed to ease the debugging process and automate it to the possible extent. I was also responsible for handling various change requests and working with different teams to provide the necessary builds.

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

Debugging tool: Trace32, Araxis Merge, Qualcomm specific tools.

Editor: Notepad++, Source Insight, Perforce.

Objectives of the project: To reduce the power consumption by LTE modem chips.

Major learning outcomes: LTE call flow, ML1 architecture, CDRX, good coding practice, training certifications.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment in Qualcomm is worth appreciating. It provides transparent, open communication, and the work-life balance is good. The company encourages employees to utilize different learning resources to broaden up their skills spectrum. Colleagues are friendly, approachable and welcoming. Different teams have different expectations. My team, being in LTE, expected me to be good in LTE concepts, C language as well as Python scripting. We should be able to write optimal codes according to the team's need. They have lot of internal tools that are required to understand. Overall experience was positive one with perfect work-life balance even in the WFH condition.

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

Name: HIMANSHU SHARMA(2019H1030030G)

Student write-up

Short summary of work done during PS-II: I built a software tool that takes the snap file as input and converts it into XML format based on certain criteria specified by the team. This XML is used by various camera teams to drive the camera system.

Tool used (Development tools - H/w, S/w): Python editor and other Qualcomm proprietary softwares.

Objectives of the project: Without converter this task used to be done manually which consumes lot of human efforts and time along with that increases the chances of human error. After using this converter, a team can handle all these challenges.

Major learning outcomes: Qualcomm work culture, Qualcomm proprietary softwares, Python and Advance Data Structures.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I have done my internship virtually, so I did not get the chance to meet my teammates in person, but I had a good working experience with them. They briefed me about the agenda and plan of the internship project and guided me to stick with the plan. I followed their guidance which helped me to complete the project on time without any hassle. Apart from that, they used to share feedback about my work monthly, which helped me a lot for staying motivated. I am expecting similar challenging work and a nice team in Qualcomm.

Academic courses relevant to the project: Computer Architecture, Data Structure and Algorithms.

Name: NISHI SINGH(2019H1030108G)

Student write-up

Short summary of work done during PS-II: Wireshark is a network snipping tool. It has the capability to capture any information of the network. However, on industrial scale using Wireshark manually to find out the anomaly like the throughput dips is not only tedious but can also be erroneous. The goal of this project is to generate necessary information by just one click on the executable. The user would just have to give the socket information and all the information, summary, the graphs would be at his/her disposal.

Tool used (Development tools - H/w, S/w): Python, Pandas, Bokeh, QC internal tools.

Objectives of the project: Automation of Wireshark analysis to find the throughput dips and necessary information.

Major learning outcomes: CN taught in college was used in real life. Major learning of all the layers and how it affects the chipset productivity.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Compatible, learning, understanding working environment. Nothing was spoon fed which led to major learning.

Academic courses relevant to the project: Computer Architecture, Data Structure and Algorithms.

Name: NIHARIKA DHAKER(2019H1030506G)

Student write-up

Short summary of work done during PS-II: My first project emphasized on creating responsive plots from logs, depending upon xml files provided by developer, and merged into internal tool to execute end-2-end scenarios. That tool is a common platform capable of analysing logs and crash dumps through visualizations i.e., plots, graphs, timelines etc. Advantage of this implementation is that it can be shared easily, and users can access parsed results anytime. It provides powerful analytics with advanced responsive plots and can compare plots across different logs.

My second project is “log parser for stability”. I designed utility framework which grep and filter traces (data) using Regex from different text log files and present the output in the form of HTML template. Major advantage of this project is that it is scalable, optimized, can be enhanced graphically for visualization, plot the system logs, and plug and play utility which can be integrated to other platforms.

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

Objectives of the project: Project 1: Analysing NR5G logs through visualizations: Creating responsive plots from logs, depending upon xml files provided by developer and merge into existing tool to execute scenarios Project 2: Log-parser for stability: Designing a utility framework to grep and filter traces (data) using Regex from different text log files and presenting the output in form of HTML template.

Major learning outcomes: Understood the purpose, modules and basic utilities used in tools.

- ✓ Most of the coding is done in c++ by me, so getting hands on Python and implementing help in understanding language (Python) better.
- ✓ Got hands on Parsing and analysing logs.
- ✓ Code browsing skills have been improved a lot.
- ✓ Understood the regex implementation and templating part.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Good, friendly, helping, need more support initially in terms of explaining the already existing applications.

Academic courses relevant to the project: Python programming, little bit of ML or data science basics will be cherry on top.

Name: DEVANSH PARADKAR(2019H1230534H)

Student write-up

Short summary of work done during PS-II: This internship project mainly deals with power intent design at SOC level and verifying it through various stages of development cycle. RTL doesn't capture any power related information of the design. It only describes the connectivity and logic sitting inside. Power intent is defined looking at the power rails coming from Power management IC and going into the various sub-systems. There is a format where power intent is written. A language known as Unified Power Format (UPF) is used to write the power intent. After writing power intent, it is verified with the help of tool. That is used to figure out the power domain crossings. These crossings need to be resolved based on the design considerations, either by shifting the power domains of the instances that wire is coming from or inserting specialized cells, which will take care of those voltage crossings. The scenarios where these decisions are to be taken are whenever, a wire is coming from a different domain and going to a different domain or the signal is coming from off domain and going to the domain which is powered on. Mainly these kind of scenarios require modifications. Sensor connectivity and chaining was also the part of the work done in the course of this internship. This is done based on the feedback received from cores, physical design teams and sensor team's recommendation. Sensors are required to be placed on the SOC to capture several parameters such as temperature, voltage, process variations, etc. My role was to get acquainted with all these works and take up small tasks in the team and apply these into the live project.

Tool used (Development tools - H/w, S/w): Company Confidential Information.

Objectives of the project: Power intent design and verification.

Major learning outcomes: Power domain related information, Sensor connectivity.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Great working environment. Company expects to be well versed in Power related domain knowledge.

Academic courses relevant to the project: VLSI Architecture, VLSI Design, Advanced VLSI Design.

Name: ANUJ NARENDRA DESHMUKH(2019H1240556P)

Student write-up

Short summary of work done during PS-II: Audio technology is being driven from its modest roots towards very highly advanced technologies used in the telecommunications industry, thanks to the rise in cell phones and smart devices. Nowadays, smartphone manufacturers like to brag about their devices large displays, the amount and quality of cameras used in their models. The sound quality, on the other hand is often ignored. My project comes into the picture where sound or audio from your applications is heard on the sink devices like mobile phone speaker, headset or other wireless speakers. My team has developed signal processing framework. I monitored the test space and supported the issues.

Tool used (Development tools - H/w, S/w): T32. QXDM, QACT, Perforce, Audacity, Putty.

Objectives of the project: To understand the functional blocks used in the SPF framework and the SPF test framework. To debug the issues and keep the failure count of tests to minimum as well as to avoid any potential issues in target, detected by a software.

Major learning outcomes: I got a good ramp up on the signal processing framework, understood the working of functional blocks and their usage in specific use cases. I am looking forward to learn new things and contribute in all the ways possible. I also understood the process of debugging and the usage of tools required for debugging.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment: All the internship was WFH, alternate day sync-up calls with the mentor and team. For any issues faced, direct call with seniors would be possible and good environment to work. Expectations: Students can expect a PPO, if they work positively on the tasks assigned to them. The manager can give proper feedback to directors. There can be a small discussion/interview regarding the work and technical skills.

Academic courses relevant to the project: Advanced Digital Signal Processing.

Name: ASHOK KUMMAR M(2019H1240559P)

Student write-up

Short summary of work done during PS-II: I joined AI software development team at Qualcomm. Our team's primary focus is to provide hardware accelerator support for Machine Learning based applications running on Android operating system. We are providing software solutions for the bug reports as well as new requirements given by Google and smartphone manufacturers.

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

Objectives of the project: Bug fixes and new module development for Android hardware accelerator support.

Major learning outcomes: Working on this project gave me a good insight of Android OS backend, especially accessing hardware backend from operating system.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: We had well organised training session and regular meetings with my mentor helped me lot to get to know organisation workflow as well as technical details required for working with my team.

Academic courses relevant to the project: Artificial Neural Network.

Name: LAHANE SANJANA HEMANT(2019H1400099G)

Student write-up

Short summary of work done during PS-II: As a part of QCT product and tools stability debug team, it is expected to have profound understanding of Qualcomm's proprietary processor, its software debugging tools and different SoCs. Through my knowledge training sessions, I got opportunity to explore Qualcomm's crash analyzer and different software debugging tools and also gained deep understanding on its Hexagon DSP processor, its real time operating system, MSM architecture, modem boot up framework, power and memory management system, heap and timer services, modem debugging basics. After got comprehensive knowledge, I was put into a project where I explored and triaged different modem related crashes for chipset stability. I have debugged different heap corruption issues which were caused due to buffer overflow, double free and dangling pointer and also heap exhaustion issues which were caused due to memory leak. I have triaged different timer exhaustion, corruption, RCINIT stuck and latency issues for which I provided root cause analysis. Along with it, I was part of the debug vertical

team which is intended to acquire in-depth knowledge in the assigned topics to triage the stability issues.

Tool used (Development tools - H/w, S/w): Qualcomm's proprietary crash dump analyzer, TRACE32 and other software debugging tools.

Objectives of the project: Debugging Product Stability Crashes.

Major learning outcomes: 1. MSM architecture 2. Hexagon processor 3. QuRT RTOS4. RCINIT 5. Heap 6. Timers 7. Modem debugging 8. Power management 9. Triaging different modem related crashes 10. QSOCKETS 11. Interconnection between IPC ROUTER and GLINK 12. 5G wireless technology.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: This internship included training and hands on experience gave me an opportunity to analyze crash dumps and identify the root cause of stability issues helping me to widen my knowledge and form concrete understanding about them, giving me direction for rational approach towards analysis and resolution of the issues in hand. The team was very interactive, helpful, approachable and always ready to clarify our doubts. As the internship was virtual, we didn't get much chance to have peer-to-peer interaction but still this didn't affect our day to day work. I had periodic meetings with my mentor and manager to track my progress. The work was quite challenging as I was part of live project where I had to interact with different test and technology teams which helped me to learn the importance of team coordination and improve my adaptability to work in dynamic environment within a time limit to execute a given task. This internship developed my overall personality and gave me good insight on how things work in the corporate world thus making me understand on how and what to anticipate once I join as a full-time employee. I felt very fortunate to get such an opportunity and exposure from Qualcomm and would try to apply all these learnings in my future endeavors.

Academic courses relevant to the project: Embedded System Design, VLSI Architecture, Adv. VLSI Architecture, Operating Systems, RTOS, Computer Architecture.

Name: MISHRA JOLLY PRADEEP(2019H1400606H)

Student write-up

Short summary of work done during PS-II: My main task was to understand the memory subsystem and generate traffic using an established framework in the company, which targeted particular scenarios in DRAM like page hits, page misses and so. This helped me understand the data flow from master to system Cache and then to memory controller, finally reaching DRAM. It helped me learn SV and UVM. Along with that, I gained experience in working linux environment.

Tool used (Development tools - H/w, S/w): System Verilog, UVM, Verdi.

Objectives of the project: Major aim of my project was to generate traffic to verify certain scenarios of DRAM.

Major learning outcomes: Learnt about memory subsystem and cache hierarchy, AMBA communication protocols. Also, learnt about major changes in memory technology field and latest technology used. Languages like System verilog and UVM.

Details of papers/patents: None

Brief description of working environment, expectations from the company: As the PS this year was WFH, I didn't meet any of the team members in person. Initially, WFH was challenging, as you don't know the other person's expectation. But the team and my manager were very supportive and helpful. This made the internship very smooth. As I was asked to present my work in front of my team every 15 days, it boost my confidence and also helped me get suggestions for improvements. I also expected to gain much technical knowledge, from the company. Along with that better interpersonal skills to enhance me as a team player.

Academic courses relevant to the project: VLSI Architecture, Advanced VLSI architecture.

PS-II Station:Rakuten Inc, Bangalore

Faculty

Name: Prof. Anjani Srikanth Koka

Student

Name: ANANT KUMAR SINGH(2019H1490819P)

Student write-up

Short summary of work done during PS-II: The objective behind this project is to study the lean and agile framework of project management and how it is being implemented in different project teams in order to manage the teams efficiently and effectively. For that to happen, one must have good idea about current framework & methodologies and how is it performing against other frameworks. So far I learnt about the project and its life cycle, lean and agile framework, Scrum methodology and Jira. Through the help of this project, I tend to improve the project management framework inside the team by making sure that the framework is being followed by all the team members. Parallelly, I also assisted another project where I was responsible for creating the tasks on Jira and keep tracking the progress of the project. I was also involved in setting up and measuring the KPIs for the pre-sales team and the support team.

Tool used (Development tools - H/w, S/w): Jira, Confluence, MS Office, Gliffy.

Objectives of the project: Research on Project Methodology in IT Framework.

Major learning outcomes: 1. Project Management 2. Presentation Skills 3. Cloud Knowledge 4. Process Management

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment was good and the staff was very much supportive. The organization provided us the laptops along with the goodies at our doorstep. It is an employee centric organization where they take care about their employees. I didn't feel working from home as being a project manager, I was mostly busy in my calls. They reward their employees at every stage of their achievement. Overall, I had very good experience.

Academic courses relevant to the project: Product & Operations Management, Project Management.

Name: DEEPA SINDHE SIVAJI(2019H1490821P)

Student write-up

Short summary of work done during PS-II: 1. Market research for new product development in Rakuten. Rakuten has an umbrella of brands across the globe and in India they initially started off as a development center but have over a period grown to include and manage several products as well. As a part of this expansion, there are several new product development ideas in the pipeline, and this involves the market research to be done for these projects. The market research involves identifying the current and future possible market for the products, revenue, competitor analysis, etc.

2. Go-to market strategy development for new products

After market research is carried out, it becomes necessary to identify go-to market strategy for the new products. This involves using several management frameworks such as BCG, SWOT analysis, TWOS analysis, Ansoff Matrix etc. to identify the best possible go-to market strategy for the products.

3. Branding and promotion of Rakuten

Carry out the branding and promotion of the Rakuten brand with education institutions during their summits or events by evaluating the proposals sent by institutions for funding and negotiating on deals to maximize the visibility of the Rakuten brand and increase the opportunities and exposure of students from various institutions to Rakuten.

4. Program management

Be a part of organizing and facilitating events such as summits, conferences (virtual mode) and act as a bridge between the company and the external organizations.

Tool used (Development tools - H/w, S/w): MS Office tools and Atlassian Confluence.

Objectives of the project: Program Management.

Major learning outcomes: Product and Program Management.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Rakuten is an employee-centric company. They took initiative to send us MacBook for our work and also paid us extra for food and internet. The company expectations is to be available anytime for work and readily contribute when the need arises

Academic courses relevant to the project: Negotiation Skills, Market Research, Product and Brand Management, Management Frameworks and Functions, Business Process and Strategy Management.

Name: FAHMI SALEHEEN AHMAD HASHSHAM(2019H1490828P)

Student write-up

Short summary of work done during PS-II: I have been part of the product management team in which one of the incident management product is being developed by the team. I have been asked to do competitor analysis, functionality comparisons and pricing strategy. Apart from it, I am also responsible for content creation work for the product confluence page like onboarding guide, feature deck etc.

Tool used (Development tools - H/w, S/w): Confluence, MS Excel, MS office 365, PagerDuty software, Jira.

Objectives of the project: To make product much better compared to competitors.

Major learning outcomes: Research and analysis.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The company is very employee friendly as during this pandemic time they have tried to help each employee by somehow. The team members were understanding and ready to guide in case of any blockers.

Academic courses relevant to the project: Strategic management, Marketing, information system, Management communications and different framework taught in strategy.

Name: LAD ARPIT PRAKASH(2019H1490835P)

Student write-up

Short summary of work done during PS-II: • Assisted Mr. Srinivas Chillara (Coach for Scrum training at Swan Consulting) for developing Agile distributed framework specifically for Rakuten India.

- Worked in agile-scrum environment, with hands-on experience in user story creation, prioritization and sprint creation.
- Involved in developing creative template for agile framework and also prepared product and feature deck for Rakuten India products.
- Have done market research and competitor analysis of different Rakuten India products.
- Carried out cost analysis and developed pricing model for one of the products (used for mobile application testing).

Tool used (Development tools - H/w, S/w): Microsoft Word, Microsoft Excel, Confluence, JIRA & Microsoft Team Planner.

Objectives of the project: Market and Competitor analysis of the Rakuten India Products. Pricing analysis and research of image optimization tools. Detailed study of Agile distributed framework.

Major learning outcomes: 1) Different techniques to do market research 2) Understanding the product development cycle 3) Learnt different tools like JIRA, confluence, kanban board, teams planner etc. 4) Learnt the Agile distributed framework and how it should be implemented in a team.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Best working environment. All the employees of any hierarchy can be easily approached. Though we were intern in the company, we were treated as a full time employees. All the benefits such as insurance, opportunity to interact and take part in various events were given to intern also. Rakuten India is very best company to start your journey where you are given equal opportunity to grow and develop.

Academic courses relevant to the project: Quantitative methods, Marketing, Business structure and process, Management Information and system.

Name: KEERTHI PRAKASH T(2019H1490851P)

Student write-up

Short summary of work done during PS-II: All the work done as part of the PS are related to IT operations. Starts from ideation of the product through market research and development

plans to pricing the product. The work also includes developing a framework for the best practices to follow in the product development.

Tool used (Development tools - H/w, S/w): Jira, Confluence, Microsoft products.

Objectives of the project: To support the product development activities and to create framework to standardise the process.

Major learning outcomes: Steps involved in IT product development.

Details of papers/patents: NA

Brief description of working environment, expectations from the company:
Professionalism is one of the important thing needed to work in this company. Taking ownership of the work assigned to us and completion is also very important.

Academic courses relevant to the project: Project Management.

PS-II Station:Ramboll India Pvt. Ltd., Gurgaon

Faculty

Name: Prof. Mahesh K Hamirwasia

Student

Name: CHIRAG CHANDRAKANT BHAGATE(2019H1430094H)

Student write-up

Short summary of work done during PS-II: I was working with Denmark Bridges & Civils team and was directly involved in some of the ongoing projects requiring analysis and design of

bridge and tunnel structures. I was responsible for design of tunnel ramp section followed by its detailed drawing and quantity calculation. I got several hours for self-study of Euro and Danish codes along with the softwares used by the team.

Tool used (Development tools - H/w, S/w): LUSAS, SOFiSTiK, BDS Modeler, MS Excel.

Objectives of the project: Design of tunnel (Top slab, base slab, ramp walls, etc.).

Major learning outcomes: Practical design approach, various design softwares, structural documentation work and quality assurance.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Great working environment in the office. Team members are helpful and guide you whenever required. Got directly involved into ongoing projects and hence its a responsible task. You are expected to know the very basics of structural design. Although, if the deadlines are very tight, you have to put in extra hours and sometimes weekend hours too.

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

Name: DARSHIL NIKHIL SHAH(2019H1430146P)

Student write-up

Short summary of work done during PS-II: I was working with Finland Bridges team in Ramboll. I was involved in an ongoing project of design and analysis of pile slabs. Besides the project, I learnt about the various components of RCC bridges and retaining walls. I also got good exposure on Eurocodes, Finnish codes and various practical aspects of pile slabs design.

Along with this, I also got the opportunity to learn trending concepts of parametric modelling and design using Rhino-Grasshopper.

Tool used (Development tools - H/w, S/w): LUSAS, TEKLA, Rhino-Grasshopper, MS-Excel.

Objectives of the project: Analysis and design of pile slabs.

Major learning outcomes: Practical design considerations and aspects related to pile slabs design.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is quite good and has friendly atmosphere. All the employees are very kind and patient while helping you. One good thing is that there is regular interaction with the team leader to check the progress of our work and necessary suggestions are suggested for our growth. Overall, it is really a good place to gain practical experience and knowledge.

Academic courses relevant to the project: Bridge engineering, Finite element method, Structural analysis, Strength of materials.

Name: ANU JOY(2019H1430610P)

Student write-up

Short summary of work done during PS-II: Initial works were majorly preparation of project reports and quantity calculation for the ongoing projects. Later, I was involved in geometry modelling, analysis and design of framed bridges.

Tool used (Development tools - H/w, S/w): BDS Modeller, Sofistik, MS Excel.

Objectives of the project: Extension of railway line in Denmark having detailed analysis and design of nine framed bridges in its course.

Major learning outcomes: Preparation of bar bending schedule, project reports. Geometry modelling and analysis of framed bridges.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was very relaxed environment for a beginner. Ample time was given to learn something new while involved in live projects from the get-go.

Academic courses relevant to the project: Structural Analysis and Design.

PS-II Station:Ramco Steels Pvt. Ltd., Faridabad

Faculty

Name: Prof. Sudeep Pradhan

Student

Name: WADHANKAR GAURAV SHIODAS(2019H1420141P)

Student write-up

Short summary of work done during PS-II: Data analysis of rejected parts, OEE implementation, COPQ and visual improvements.

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

Objectives of the project: The ultimate objective was to discuss the organization's current issues and introduce descriptive forms of improving the work environment and plant efficiency to grow corporate excellence.

Major learning outcomes: OEE, COPQ.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Good working environment, excellent mentors and supporting staffs. You are free to work in any domain for organization improvement. Good learning outcomes.

Academic courses relevant to the project: Lean Manufacturing, Structural analysis.

PS-II Station:Rane (Madras) Ltd., Kancheepuram

Faculty

Name: Prof. Benu Madhab Gedam

Student

Name: PRAGATHEESH K(2019H1060514H)

Student write-up

Short summary of work done during PS-II: Rane group has set a goal of increasing their productivity in the upcoming financial year as they are planning to expand their market further across the world. So, the productivity has to be increased either by reducing the TAKT time or man power. There are various machining and assembly lines in the plant. All of these lines have to be studied by doing method study, plot Man-machine chart and yamazumi chart in order to find scope for improvements. Based on these improvements, it has to be implemented and the changes should be sustained. To attain this, the production process flow and line layout is

completely studied and the activities of each operator is recorded. Breaking down the activities in man machine chart and yamazumi chart, operators idle time and unwanted motions were captured and analysed. There is possibility to combine two or more activities, eliminate the unwanted activity and simplify the activity, so that the cycle time of each operator can become less than the actual takt time and the productivity can be achieved.

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

Objectives of the project: To improve the manpower utilization and productivity of the plant.

Major learning outcomes: Lean manufacturing, Machine tool engineering.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment was good. I had full freedom to do everything like an employee. They had very high expectation from a BITS student. They expected to give suggestions related to modern technologies which can be useful for them.

Academic courses relevant to the project: Machine Tool Engineering.

PS-II Station:Rane TRW Steering Systems Pvt. Ltd., Guduvanchery

Faculty

Name: Prof. Benu Madhab Gedam

Student

Name: KARTHIKNATH S(2019H1420140P)

Student write-up

Short summary of work done during PS-II: The work involved identification of productivity improvement measures that can be done in the Rane plant. A method study based approach was undertaken to identify the current status of plant functioning such as standard work times, material flows, process flows and production sequence. Then, improvements based on the data obtained were discussed based on capacity analysis, layout analysis, time study and takt time measures. Further ideas of incorporation of elements on Industry 4.0 technologies were identified.

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

Objectives of the project: Productivity Improvement.

Major learning outcomes: Conducting time study, Motion study, Layout planning.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: The plant workers were very helpful and provided assistance on any issues that I faced. There are no barriers between departments and thus it was very easy to gain lot of knowledge on departments other than Manufacturing Engineering such as Materials, Product Engineering, Finance etc. I was provided transport facility as well as free lunch during the PS tenure. The company expects consistent output based on the project deadlines and schedules.

Academic courses relevant to the project: Industrial Engineering.

PS-II Station:RCI DRDO, Hyderabad

Faculty

Name: Prof. Y.V.K. Ravi Kumar

Student

Name: DEVANAHALLI SUNIL ARCHANA(2019H1030519P)

Student write-up

Short summary of work done during PS-II: Implemented algorithm for object recognition followed by tracking using deep neural networks like YOLOv4 and VGG16. This was implemented in Python using deep learning frameworks like PyTorch and Caffe. For tracking, we used transfer learning using VGG 16 pre-trained weights. The algorithms were able to detect and track small objects in the data collected by the team.

Tool used (Development tools - H/w, S/w): Python, PyTorch, Caffe, Tensorflow, Arrayfire, YOLO,Numpy,Opencv,VGG16.

Objectives of the project: To detect & track small objects like birds in the sky to help in aerial guidance.

Major learning outcomes: Deep learning, Data collection and modeling, reading research papers, team work, soft skills.

Details of Papers/patents: None

Brief description of working environment, expectations from the company: The R&D culture of the organization is very good and motivated me to come up with innovative ideas and explore them.The regular meetings with my mentor and teammates helps me explore techniques and also solve the issues that I come up with. My mentor is always open to listen to new ideas and give his inputs.It was great learningexperience and will be useful lesson for all future machine learning endeavors.

Academic courses relevant to the project: Machine Learning, Artificial Intelligence, Image Processing.

PS-II Station: Receivables Exchange of India Ltd., Mumbai

Faculty

Name: Prof. Shree Prasad Maruthi

Student

Name: SHREYAS CHANNABASAVARAJ BANAGAR(2016B4A30485G)

Student write-up

Short summary of work done during PS-II: Worked on various web development projects at the PS-II station. The 3 major web development projects worked were - onboarding, TReDS application documentation, RXIL website hosting. The onboarding project involved working with an external development team in the development of a completely new web application for the Onboarding process. The TReDS application documentation project involved working with the internal team of developers to completely understand and document the existing web application for TReDS and all its APIs. The RXIL website hosting project involved migration of the RXIL web application from the external team's server to the RXIL's internal server.

Tool used (Development tools - H/w, S/w): HTML, CSS, React, Node.js, Docker, Kubernetes.

Objectives of the project: To improve, enhance and understand the various web applications at RXIL.

Major learning outcomes: Learnt majorly about various web development technologies and how they can be used to develop various web applications.

Details of papers/patents: No papers/patents were published at the PS-II internship.

Brief description of working environment, expectations from the company: Receivables exchange of India Limited being a small organization, had a small IT team with divisions in the IT team being Infrastructure, Quality Assurance and Development. Being a small organization, all the three divisions of the IT team would collaborate on various tasks which sometimes even lead to learning how to perform tasks from a different division like, an individual from the development team had to even take up tasks of the infrastructure team. It being a small organization, there is lot of learning, while working as an intern at the organization.

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

PS-II Station:Reflexis Systems India Pvt. Ltd., Pune

Faculty

Name: Prof. Ashish Narang

Student

Name: RACHIT SHARMA(2017A4PS0178P)

Student write-up

Short summary of work done during PS-II: Worked on web development projects.

Tool used (Development tools - H/w, S/w): STS 4.0, Spring boot, Java, Kubernetes, Docker, MongoDB.

Objectives of the project: Worked on Spring cloud data flow and made few basic APIs using Java and Spring boot framework for the company with the help of STS 4.0. Created cluster of machines in MongoDB using Kubernetes (Kubectl, Minicube and Docker), made multiple pods, containers, and deployments in the same. Created a basic rest API in Spring boot and created

an image to run that application, made test endpoints for the same. Worked on a POC(Proof of concept) project for RTM(Requirements Traceability Matrix) using MongoDB.

Major learning outcomes: Learnt about development of APIs in Java using various frameworks like Spring. Also, got my tech stack knowledge updated through the experience.

Details of papers/patents: Nothing

Brief description of working environment, expectations from the company: The working environment is pretty good. There is no pressure from the higher authorities, deadlines are flexible. The people in the company are supportive and overall it is a chill station.

Academic courses relevant to the project: OOPs, DSA.

Name: ABHINAV KUMAR(2017A8PS0531P)

Student write-up

Short summary of work done during PS-II: The idea of N-layered architecture is to organize the data flow from the client to the server into a well organized and independent series of steps. The value of N is decided by the complexity of the software. In this project, 3 layers have been used. Each of these steps or layers constitute a separate framework for the flow of data. Java object oriented design has been employed to write each layer starting from taking inputs from the user to storing it in the database. The application we are working on is called AI Performance Manager. There are lots of new features being added frequently to the application and this report summarizes all those changes, their implementations, testing that followed and the eventual push into the trunk code repository.

Tool used (Development tools - H/w, S/w): JAVA 1.8, Eclipse, Apache Spark, NiFi, JIRA, Confluence, MongoDB and Spring Framework.

Objectives of the project: The primary objective is to learn new technologies that can be employable by the organisation like SpringBoot, MongoDb, JAVA. An appropriate choice of medium will decide the delay with which they can be learned, as the learning process also should be reasonably time consuming 2) The second objective is to ensure the protection of precious customer data and their atomicity, so that multiple access to the same data cannot take place given a time instant and the changes made to it are consistent. Otherwise, the loss to the organisation will be huge 3) The next objective is to decide a way to write complex software design for AI Performance Manager and AI Decisions. Though every software design has its own pros and cons, the one which has the least cost and efficient needs to be preferred.

Major learning outcomes: Relation between academic concepts and industry applications. Office culture functioning, teamwork. New softwares for specific roles, software architecture in OOP paradigm.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I was part of a team called Advanced Analytics Team, which mainly focussed on two different applications, AI Decisions and AI Performance Manager. With 14 members in the team, everyone is focused in his separate field of expertise. I, along with two others are involved in backend development for these two applications. Also, I have been in touch with the HR team, who constantly make sure that I am doing alright in the internship. My role in the team so far has been, about writing codes under the supervision of fellow senior engineers in my team, at the same time exploring new ideas. I have been assisted thoroughly to develop the backend code. There are daily meetings to ensure removal of doubts, which assists me a lot to improve and learn about the product.

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

Name: BHAVYA JAIN(2017AAPS0987G)

Student write-up

Short summary of work done during PS-II: Worked on the maintenance and improvement of the Reflexis Workforce Scheduler.

Tool used (Development tools - H/w, S/w): JSP, JavaScript, HTML, CSS, Java, SQL.

Objectives of the project: To resolve various bugs arising in the RWS software and to make improvements in the existing functionalities.

Major learning outcomes: Web Development, Debugging, DevOps, Agile methodology.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Decent working environment, flexible timings and professional peers. The company expects every intern to have basic knowledge about web development.

Academic courses relevant to the project: Object Oriented Programming.

Name: TRIVENDRA SINGH(2017B4PS1227P)

Student write-up

Short summary of work done during PS-II: I worked on android development. So I started from basics in starting weeks, then I started working directly on production Apps. Initially, I faced problems in understanding the architecture of the running code, but after few weeks, I got comfortable. Seniors developers are always there to help you out, so I haven't faced any problem. I was working on their workforce management Apps, and I worked on those apps that are in production state, so basically, I was working on small projects like I need to develop a particular feature in the developed App. Mainly, I worked on voice recognition (anyone using the WFM app can perform several tasks like check-in, check out without any manual input), clock

attestation (Due to the COVID-19 crisis, customers want to ask specific questions regarding symptoms or safety during punch in or punch out transactions at the clock. This data are captured in RTA tables as defined in Attestation Functionality - Solution Document. Customers want to create few reports based on those captured data to track the stores), App-update, and WAGA accessibility. Apps were developed using native android development used Kotlin and Java both.

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

Objectives of the project: Working on small tasks / sprints for the Reflexis workforce management mobility team.

Major learning outcomes: I got good software industry experience, the most important thing that the team treated me as a fresher so I got proper training, senior developers supported in learning android development from scratch. I was working on a live project so I got the experience to see all steps involved for any App to go into production state.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: PPO probability is almost 100%. They offer PPO to every BITSian. Zebra technologies acquire Reflexis system, but still products are named on Reflexis. The environment was very nice, we were treated as employees and never felt overburden. The office timing is also flexible, company members were very helpful, they are always ready to help us out. Also, company won't expect much from interns, so anyone can save time to prepare for placements or anything. The overall culture is very good.

Academic courses relevant to the project: OOP, DSA.

PS-II Station:Reynlab Technologies India Pvt. Ltd., (Integrated Automotive Lab), Hyderabad

Faculty

Name: Prof. S. Raghuraman

Student

Name: MAFIZ UDDIN AHMED(2019H1060513G)

Student write-up

Short summary of work done during PS-II: My project was on developing the battery management system and calculating the MPGe(Miles per Gasoline Equivalent) of electric vehicle in Ricardo Ignite.

Tool used (Development tools - H/w, S/w): Ricardo Ignite and Matlab.

Objectives of the project: To calculate the power required by motor to run a motorcycle wheel of 7kg at 45km/h and acceleration of 3 m/s² and calculating the battery pack capacity to run the required motor. Then, compared 5 presently available EV in Indian market and note down the parameters affecting MPGe and optimise each parameters and based on the optimised parameters build our own EV Model and compared with the best of the 4 chosen model.

Major learning outcomes: Learnt about basics of electric vehicle, battery management system, Ricardo Ignite software.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was basically an integrated automotive lab of BITS Hyderabad Campus. WILP (work integrated learning program) basic objective was to expand the lab and setup some learning resources.

Academic courses relevant to the project: DD, DSP.

Name: RAJIV RANJAN GUPTA(2019H1410088H)

Student write-up

Short summary of work done during PS-II: I worked on automobile automation. Basically developing the features of Advanced Driver Assistant System (ADAS).

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

Objectives of the project: We mainly worked on lane detection using Python OpenCV. At first, we tried to detect straight lanes then we extend it to the curvy lanes and also to detect any obstacle near to the vehicle like pedestrian crossing the road, buses, cars etc.

Major learning outcomes: Python, Image processing, ML.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is good, it helps us to learn many tools.

Academic courses relevant to the project: DD, DSP.

PS-II Station:Rite Infotech Pvt. Ltd., Hyderabad

Faculty

Name: Prof. Y.V.K. Ravi Kumar

Student

Name: SREEKAR CHITTI(2017A8PS1928G)

Student write-up

Short summary of work done during PS-II: Created a user registration and authentication application using Django Rest Framework, ReactJS and MySQL.

Created an API using Postman for the same project.

Created a CI/CD Pipeline using Gitlab and AWS for the same project to automate the process of setting up the servers, installing the dependencies and deploying the application.

Tool used (Development tools - H/w, S/w): Gitlab, AWS, Visual Studio Code& Postman.

Objectives of the project: The aim of the project was to create a Continuous Integration & Continuous Deployment (CI/CD) pipeline for a simple Django API project that inputs the first name and last name and is supposed to output the full name together. The purpose of the CI/CD pipeline is to help create an autonomous system that helps in deploying the application, every time a change is made. This helps to identify the problems that occur, when changes are made, as quickly as possible, as the pipeline will set up the sever and commands for us and the user need not create it every time to see the output. This helps save time in development, as the user can devote his time to other projects while waiting for the pipeline to run.

Major learning outcomes: All the projects handled were completely new, so I was able to learn a lot on how to use Django Rest Framework and building CI/CD pipelines using Gitlab and AWS.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: It was a nurturing environment, where the company allowed us time to grow and understand how to

develop the applications after a hasty initial demo project creation. Everyone at the company was nice and were willing to answer any questions that came their way.

Academic courses relevant to the project: OOP, DSA.

PS-II Station:Rupifi Non-Tech, Bangalore

Faculty

Name: Prof. Sandeep Kayastha

Student

Name: JANUPALA GNANESHWAR REDDY(2016B4A40512H)

Student write-up

Short summary of work done during PS-II: UI/uxdesign and Frontend development, design was done in figma where as frontend development was majorly done using Reactjs and I got a chance to explore flutter and compare it with react native.

Tool used (Development tools - H/w, S/w): Figma, React JS,Flutter.

Objectives of the project: UI/ux design and Frontend development for websites and Apps.

Major learning outcomes: Familiarity with react JS and flutter.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Rupifi is an fintech startup set up in 2020, As it is a start up, we got chance to work on real time projects though we were allotted some major projects they gave us the time to adapt to the technologies

they use, they are pretty friendly and encourage freshers, they just expect us to have basic knowledge they give us time and help us in learning the complex software.

Academic courses relevant to the project: DSA.

Name: SAI DHEERAJ GOPALA(2016B5A20565H)

Student write-up

Short summary of work done during PS-II: Rupifi is an LSP, catering to the needs of Small and Medium Enterprises (SMEs) throughout India, following a unique system of lending in partnership with leading aggregators in India. The project involves handling the daily operations for different aggregators, in tie-up with Rupifi. My project work which is in operations area involves approaching new customers from the list given by the aggregators for onboarding, monitoring their status on dashboard, updating and helping the customers, completing the legalities, preparing details of disbursal for transactions by seniors, completing the required formalities after disbursal. In daily operations, verifying the documents and getting the required documents is an important part. The preparation of the customer's profile for underwriting by seniors and the documentation is part of my project. Also, the project domain includes analyzing the existing data with metrics such as turnaround time, approved/ completed ratio so as to get better picture of scenario of the tie-up with aggregator, suggesting improvements and changes in the current organizational process flow so as to optimize and increase effectiveness.

Key Areas - Business Analytics, Risk Analytics, Business Intelligence, Product Management.

Tool used (Development tools - H/w, S/w): Google Sheets, SQL, Power BI, R Programming.

Objectives of the project: Managing Business Analytics and Growth at Rupifi.

Major learning outcomes: Analytics, Product Management, Process Optimization.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Small team of 25 that is very approachable and friendly.

Academic courses relevant to the project: DSA.

Name: SAI PRASANTH REDDY SYAMALA(2017A1PS1200H)

Student write-up

Short summary of work done during PS-II: Started by learning different credit products and competitors in the MSME/SME lending market. Slowly got integrated into Rupifi operations team, learnt different steps like customer onboarding, passing leads with cash flow data to credit team, passed approved leads to NBFC partners, uploading final offers to customers through anchor partners, selling the product to the client if they're fielding multiple offers, managing drawdowns and credit lines, finally drafting documents and collecting digital signatures.

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

Objectives of the project: Get as much disbursed (amounts) as possible and meet targets set.

Major learning outcomes: Customer interaction and acquisition, B2B lending interactions and operations, collections, KYC checks, eligibility for credit through bureau history and sales.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Startup culture, long hours often 12 h / day. Colleagues are all very nice and it's a good learning environment. They give you a lot of responsibility once you pick things up. Always looking for improvement in efficiency and production. Expects ideas in reducing TAT for steps in the process and how to get more customers converted. Do everything you can to meet the target.

Academic courses relevant to the project: DSA.

PS-II Station:Samsung R & D Institute, Bangalore

Faculty

Name: Prof. Lucy J. Gudino

Student

Name: SHIVAANK AGARWAL(2016B4A70675H)

Student write-up

Short summary of work done during PS-II: The first project was on Audio classification to detect sounds such as baby cry, alarm,etc. and hence immediately send a signal to the user in case of such an activity. It involved training on customly collected data and improving pre-existing YamNet model.

The second project was on video summarization for surveillance cameras. It involved automatically identifying uninterested frames in security cameras so that the user would only have to see the summarized version.

Tool used (Development tools - H/w, S/w): Python. PyTorch, Tensorflow, Android Studio.

Objectives of the project: Creating real time audio classification model to give real time updates to the user, using their old samsung device. Video summarization for pruning of uninterested frames to reduce the time taken to watch security videos by more than 80%.

Major learning outcomes: Reading papers, Writing efficient code, Using deep learning frameworks, Working in a team.

Details of papers/patents: Submitted to Indicon 2021.

Brief description of working environment, expectations from the company: Great working environment and office space. Projects are research oriented and mentor gives sufficient time to complete the tasks. People are generally helpful and you are treated as a regular employee.

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

Name: GAURAV PUNJABI(2019H1240091P)

Student write-up

Short summary of work done during PS-II: Developed a code to implement reinforcement learning to improve open loop power.

Tool used (Development tools - H/w, S/w): Python, PyTorch, ns3.

Objectives of the project: To apply machine learning technique for uplink open loop power control.

Major learning outcomes: LTE, 5G, Reinforcement Learning, ns3, Power Control.

Details of papers/patents: Paper drafted for Samsung best paper award-2021 as well as for international conference.

Brief description of working environment, expectations from the company: The working environment was very nice. The co-workers were helpful with all my doubts. They were supportive, understanding and uplifting in nature.

Academic courses relevant to the project: Advanced Digital Communication, Mobile and Personal Communication, Artificial Neural Network.

Name: JINKA UDAY SAGAR(2019H1240558P)

Student write-up

Short summary of work done during PS-II: I am in vRAN team. I have assigned two projects. First is Modulation Compression of IQ bits in O-RAN. Compressing the fronthaul Bandwidth i.e. 16 bit IQ data in O-DU side and decompressing the IQ data in O-RU side which is completely lossless technique. Second is EVM testing in LTE Downlink Chain. I have done this in Matlab platform which involves plotting of the constellations of different channels present in LTE and calculated the EVMs of those panels.

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

Objectives of the project: Implementation of ORAN phase 5 features.

Major learning outcomes: Coding in C language for ORAN application software that runs on INTEL Skylake Processor.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I am in VRAN team of Network Modem. The working environment is quite friendly and the mentors helped me in every aspect of the problem. Also, the team members are very highly intelligent and helped me whenever I ask doubt. The manager is very good and he will solve every problem and he is also quite friendly. Mainly, we have to crack one coding test in order to get PPO. Overall, it is the best part of my life in Samsung and we enjoyed a lot here.

Academic courses relevant to the project: ADC, ANN.

PS-II Station:Samsung Semiconductor India R&D Center-Hardware, Bangalore

Faculty

Name: Prof. Anita Ramachandran

Student

Name: VISHAL SINGH DEOLEYA(2016B4A30625P)

Student write-up

Short summary of work done during PS-II: Created a cross-platform desktop application to automate certain procedures in the process of hardware testing. I used QtDesigner to create the UI of the application andPyQT, which is a wrapper around the Qt framework to create back-end for the application.

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

Objectives of the project: Creating a desktop application for automating hardware testing.

Major learning outcomes: Familiarity with creating computer software.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: Work-life balance is decent.

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

Name: ALAUKIK JOSHI(2016B5A30611H)

Student write-up

Short summary of work done during PS-II: I was introduced to the SoC RTL team and got to learn about how this team plays very significant role in the product cycle. Starting from the initial architecture design to the Tape out the team is involved in various activities such as RTL assembly, sanity checks for a cleaner RTL, SFR access test (miniature version of SoC Design Verification(DV) Environment), UPF and VCLP check communicating with different teams such as DV, PI (Physical implementation)and DFT(Design For Testing) team.

The next important task was creation of script to automate the whole SoC integration flow to make the process of RTL integration more efficient and less cumbersome for the user. While performing this task, I used bash and Python to implement the desired functionality.

Tool used (Development tools - H/w, S/w): Spyglass DFT(TestMAX Advisor), Spyglass Lint, Verdi.

Objectives of the project: 1)Integration and verification of sub-system in SoC 2) To automate the SoC RTL integration flow.

Major learning outcomes: 1) AMBA APB, AHB, AXI communication protocols2) SoC RTL integration flow starting from system architecture, initial RTL design to sanity checks3) Power management in SoC's4) SFR access test and debugging using Verdi.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: The working environment in the company is really great. Although it was WFH internship, the experience at Samsung was really nice.The mentors and managers are really supportive and will keep you motivated. There are many opportunities for us to grasp upon and grow.

Academic courses relevant to the project: Digital Design, Advanced VLSI Design.

Name: PANKAJ PAREEK(2019H1230054G)

Student write-up

Short summary of work done during PS-II: Project is based on IP level and module level verification of a bigger SOC environment and achieves a higher coverage using random constraint verification. Learning from the project is system Verilog for verification and universal verification methodology to write reusable test benches and understanding of design architecture document and accordingly prepare verification plan and test bench architecture to achieve greater coverage and report bugs in to design. Contribution in the project is to update the verification test bench for the latest architectural requirements and debugging skills required to report issues related to test bench and in RTL design.

Tool used (Development tools - H/w, S/w): Cadence xcelium, Simvision, Linux, AXI VIP.

Objectives of the project: Project is based on IP level and module level verification of a bigger SOC environment and achieves a higher coverage using random constraint verification.

Major learning outcomes: System Verilog , UVM , AXI, DMA controller.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment is WFH and access to RBS portal and Linux environment is provided, self learning and frequent presentations followed by mentor interaction and have to perform tasks according to new requirements.

Academic courses relevant to the project: VLSI test and testability.

Name: PIYUSH PARASHAR(2019H1230523G)

Student write-up

Short summary of work done during PS-II: In this testing related work is done

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

Objectives of the project: Verification

Major learning outcomes: System verilog

Details of papers/patents: Explanation of testing

Brief description of working environment, expectations from the company: Very good

Academic courses relevant to the project: Test and testability

Name: CHALAMALASETTY HEMANTH(2019H1400079H)

Student write-up

Short summary of work done during PS-II: My work mainly targeted on test automation using NLP and tests on DUT devices with I2C ports. We used Natural Language Processing (NLP) to derive test clauses from specification document and guide the VLSI Engineer in test planning. Further, we developed a new test architecture for I2C Slave (DUT) devices with less testing time and is device independent.

Tool used (Development tools - H/w, S/w): System Verilog, Python, NLTK Toolkit, Spacy and Scikit-Learn Libraries, Jupyter Notebook.

Objectives of the project: The main aim of the project is to reduce time-to-market. In this project, we created test environment consisting of reusable system Verilog verification modules and test scenarios that automate DUT testing to reduce verification time. Further, we use NLP and ML algorithms to guide testing.

Major learning outcomes: 1) Workflow of testing in industry2) Test environment building and development of test scenarios3) Data & text processing for automation.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: My mentor is friendly and his motto is "Understanding comes first, Implementation Later." Expectations from my mentor: "Passion to Learn, Understand and Question". He gives time to understand the problem and solve it on my own. Overall, I have wonderful time working at SSIR.

Academic courses relevant to the project: VLSI Architecture, VLSI Test and Testing, Reconfigurable Computing, Introduction to ANN.

Name: NILANKAN BISWAS(2019H1400121P)

Student write-up

Short summary of work done during PS-II: I was allotted to standard cell library design team in foundry division of SSIR. Initially, I had to go through the literature review of RTL to GDS flow to get proper application of standard cells in digital design flow (particularly the physical design flow), then went through the basics of standard cells, its various types, and basics of fabrication process. On the forefront, initially designed basic gates (e.g DFF, XOR, NAND etc) in Cadence virtuoso and for the simulation performed synopsis finesim runs using spice decks. My project work was mainly to automate using scripts to map old library pin convention to new library pin convention to update the CDL for a particular technology library which contains 208 cells. I developed using Perl scripts, updated the CDL and then performed LVS to check the functionality. The project is extended by implementing a verify script which is a standalone script

already available to integrate it with the CDL modification script and finally at one place the script as a whole can first update the CDL and check its functionality. At the end, performed quality analysis check to measure PPA, Latchnode stability, Decaps etc using Samsung's proprietary tools.

Tool used (Development tools - H/w, S/w): Cadence Virtuoso, Synopsis finesim, Hspice, Calibre LVS, Shell, Perl scripts (for automation).

Objectives of the project: To reduce the manual effort of updating the pins in schematic from the pin mapping file by designing an automation script.

Major learning outcomes: Standard cells basics, its application in ASIC design flow, how to perform design tasks using automation scripts.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work environment is very professional. My team has 16 members but I interacted mostly with my manager and mentor during the entire duration. Manager and mentor are very much helpful and easily approachable. If you stuck at some points, mentors will definitely help you and provide you with solution. Only thing is that you need to go through the basics on your own and constantly follow up with your mentor. At the end, I had to give presentation in front of the entire team and also with senior and the associate director about the internship work over the entire duration. Regarding PPO, they mostly convert the interns who have interest in that work, zeal to learn and constantly following up with the mentors and managers.

Academic courses relevant to the project: VLSI design and Advanced VLSI design.

PS-II Station:Samsung Semiconductor India Research -Software, Bangalore

Faculty

Name: Prof. Anita Ramachandran

Student

Name: NAMAN K. GUPTA(2016B4A30491G)

Student write-up

Short summary of work done during PS-II: Multiple small projects completed were,

1. Addition of features to a code coverage tool (continued from previous semester PS).
2. HTML based code coverage report generation.
3. System crash information tool revamp.
4. Python automation of the above the projects.
5. Perl to C++ migration of another indigenous tool.

Tool used (Development tools - H/w, S/w): Tool: Code editor, one more indigenous tool not supposed to be disclosed.

Languages: Python, C, C++, Perl.

Objectives of the project: NA

Major learning outcomes: Code coverage, HTML, CSS, Javascript, Jquery, Industry level coding methodology, best practices, efficient technical documentation.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The exact workculture cannot be described as the entire duration of the internship was WFH. The employees were very friendly and supportive in all fashion. Least to say, deadlines were decently decided mutually. Expectations to begin with, were to gain industry exposure on as to how organizations approach development of a software and SSIR has surpassed all expectations.

Academic courses relevant to the project: Computer programming, Data structures and algorithms.

Name: PATANKAR AKHILESH SUDHIR(2016B5A30553H)

Student write-up

Short summary of work done during PS-II: I had two projects during my PS-II. The first project was on memory flexibility and creating different configurations of ACPI tables. The second project was on making custom hardware accelerator openCL compatible.

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

Objectives of the project: Memory flexibility.

Major learning outcomes: Understanding of ACPI tables and memory management, openCL.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work environment was very good and the expectations were met.

Academic courses relevant to the project: CP.

Name: AKARSH CHATURVEDI(2016B5A80582P)

Student write-up

Short summary of work done during PS-II: The project consists of development of parts of new generation Android graphic rendering pipeline in compliance with the latest cutting-edge display devices capable of up to 120Hz refresh rate, and up to 8 dpp (display pre-processing) channels. It is continuation of my previous project. This project mainly focuses on one of the core components of the Android graphic rendering pipeline, Hardware Composer. Hardware Composer exists inside the HAL (Hardware Abstraction Layer) of the Android software stack. Its primary function is to compose the final composited display and send it to the display device. Even though, most of the compositing is done by GPU, it is the hardware composer's job make the final call ensuring the most efficient way to composite buffers with the available hardware using the least processing power. The project constitutes of upgrading the existing Exynos hardware composer HAL for newer display devices which introduce latest display processors.

Tool used (Development tools - H/w, S/w): Exynos chipset, C++, Bash.

Objectives of the project: The project constituted of upgrading the existing Exynos hardware composer HAL for newer display devices which introduce latest display processors.

Major learning outcomes: Version control systems, Android kernel, and system I/O.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Because of the pandemic, the entire work was done remotely throughout the team. However, the team I was assigned helped me plenty to make up for the disadvantages of remote work.

Academic courses relevant to the project: Operating Systems, Object-oriented programming.

Name: MEDURI M PRASHANTI KUSHAGRA(2019H1400074H)

Student write-up

Short summary of work done during PS-II: I have researched and learnt everything from scratch and implemented it in the system. The speed of getting desired results for the professionals has increased 100x. The efficiency of every attempt to get data from the database has improved effectively due to proper connection established due to Django. I have learnt that how to develop web-based services and how M-V-C architecture is implemented in it.

Tool used (Development tools - H/w, S/w): Django Framework 3.1-software, Postgres SQL language, Python3.

Objectives of the project: To visualize and make a user-friendly interface for professionals to get desired results from the database.

Major learning outcomes: New Technology: I have used Django Framework 3.1 which my team never heard of and tried to implement. I have researched and learnt everything from scratch and implemented it in the system. The speed of getting desired results for the professionals has increased 100x. The efficiency of every attempt to get data from the database has improved effectively due to proper connection established due to Django.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Great working environment, very open, straight forward about the work and planning related towards the project, what they want and what are the expectations. My expectation from any company would be same, ideally concentrating and focus on progress of work.

Academic courses relevant to the project: Software for Embedded Systems (Python mandatory).

Name: PRAVEEN KUMAR(2019H1400076G)

Student write-up

Short summary of work done during PS-II: The project I worked on was 'Enhancing USI drivers in QNX on Samsung SoC'. The Universal Serial Interface (USI) is a multi-functional hardware resource which provide the basics hardware for several serial communications and is much faster and reliable than software implementation. It can be configured as UART, I2C or SPI interface based on the implementation of USI drivers. I was assigned the work of adding multiple chip select feature in QNX SPI driver. In regular SPI mode, when multiple slave devices are connected to the SPI controller, then multiple chip select (CS) lines are required to identify the active slave. In QNX SPI driver, whenever any user wants to communicate with a particular slave device, the SPI device will be configured with the device ID. After the configuration is done, then only read/write operations will be performed.

Tool used (Development tools - H/w, S/w): Samsung's Development Board, MobaXterm, Minicom, Git, Gerrit, MobaxTerm editor, C language.

Objectives of the project: Enhancing USI drivers in QNX platform on Samsung SoC.

Major learning outcomes: QNX platform, Device drivers, Driver programming, Building, flashing and testing the code on target.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I really liked the working environment. People in the organization are very supportive. The constant guidance and support provided by my mentor and buddy led me to successfully complete the project assigned to me.

Academic courses relevant to the project: Device Drivers.

Name: SHUBHAM TYAGI(2019H1400558H)

Student write-up

Short summary of work done during PS-II: In this project, my work is to design and develop models in C++ and modules / sub-modules in SystemC for the organization's IP. The model(s) in C++ acts as a golden reference for behavioural verification of modules / sub-modules in SystemC. Once the behavioural verification gets passed,further optimizations are planned based on area, power and performance report(s).

Tool used (Development tools - H/w, S/w): MS visual studio, Cmake for SystemC, SystemC simulator, Qemu.

Objectives of the project: To design and develop models in C++ and modules / sub-modules in SystemC for the various IP and further optimize it based on the generation of area, power and performance report(s).

Major learning outcomes: From this project, I learnt about the aspects of Memory bus modelling, their various architectures associated with it. I learnt how optimizations are performed on software, design and develop full-fledged algorithms on C++, SystemC. I also got acquainted with the Linux platform and tools such as SystemC simulator, Qemu for development and verification.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment at SSIR is excellent and encouraging. My mentors have helped me tremendously at all times. Their immense knowledge, profound experience and professional expertise in Memory Architecture have enabled me to keep me motivated and complete this PS-2 course successfully. The organization's infrastructure and financial support helped me to achieve good strides in my learning curve. Here you also have an excellent work-life balance.

Academic courses relevant to the project: Embedded systems,VLSI architecture,Reconfigurable computing, Algorithm design and data structures.

PS-II Station:SAP Labs, Bangalore

Faculty

Name: Prof. Swarna Chaudhary

Student

Name: MANASA HARISH(2017A7PS0094G)

Student write-up

Short summary of work done during PS-II: PS at SAP enabled me to develop many new skills and worked on interesting projects. I was in the Gardener team. Gardener uses Kubernetes to manage Kubernetes clusters. Hence, I learnt Docker, Kubernetes, Custom Controllers, Webhooks etc. in the first two months. My manager sent many useful links and some hands-on tasks too. Post this, I worked on few projects related to autoscaling(automated increasing or decreasing the resources of a component based on the workload). The main project of my team is building the new VPA recommender. I worked on enhancing the VPA exporter to read and export new recommendations as well. I also worked on tabulating the downtime of the ETCD deployment. I collaborated with performance team for this. The biggest project I worked on was scaling the metrics server. Through this, I used the Addon Resizer sidecar to scale the metrics server. I also updated the onboarding local setup guide to include steps of newer versions of Gardener. I also enhanced the Gardener Resource Manager(a component that keeps reconciling and keeps the cluster in its desired state) to include an annotation from the metrics server. I also started working on HVPA(Horizontal Vertical Pod Autoscaler).While the learning experience has been great, I was given the opportunity to work on very important projects that are integrated with the new Gardener release. This motivated me to give it my best effort.

Tool used (Development tools - H/w, S/w): Docker, Kubernetes, Gardener Dev Landscape, Gardener Local Setup, VPA, Metrics Server, Addon Resizer, Gardener Resource Manager, Visual Studio Code, GitHub.

Objectives of the project: Improve and enhance autoscaling across Gardener. Enhance the VPA exporter to read and export annotations from the new recommender. Calculate and tabulate ETCD downtime to enable development of the ETCD Scale metrics server without VPA to remove circular dependency, and enhance the GRM Add webhooks and enhance HVPA v2.

Major learning outcomes: I learnt Docker, Kubernetes and Gardener, VPA, HVPA, Metrics server, API server, Custom controllers and CRDs. I collaborated with different teams and this was great learning too.

Details of papers/patents: No patents or papers were involved. The enhancements I made are merged with the Gardener product. Some of them will be a part of the next release.

Brief description of working environment, expectations from the company: The work environment is very nice, and there are no hard deadlines. The team is very helpful and friendly. It is better if the student opting for PS at SAP is open to PPO, as they look at the internship as a learning experience for their full time employees. And they offer PPOs to most interns.

Academic courses relevant to the project: Advanced Operating Systems and many online courses were relevant and useful.

Name: FERNANDES AARON FRANCIS(2019H1030512P)

Student write-up

Short summary of work done during PS-II: Worked with the Gardener team, a team that works on an open source software called Gardener. The Goal of Gardener is to provide kubernetes clusters as-a-service and helps clients manage a huge number of clusters quite

easily. Worked primarily on the etcd component which is the backing store of the kubernetes cluster. Tasked with multiple stories which include improving existing functionalities, providing new functionalities, as well as writing test cases.

Tool used (Development tools - H/w, S/w): Go, Git, YAML.

Objectives of the project: The objective of the project was to improve Gardener as a software.

Major learning outcomes: Kubernetes, Docker, Go, Git.

Details of papers/patents: None

Brief description of working environment, expectations from the company: I had great team to work with. The initial few weeks were spent in just learning about Docker, Kubernetes, Go, etc. Everyone on the team were technically brilliant and there was always something to learn from every interaction I had. There wasn't much expectations from me early on. The only expectation was that I stay curious and pick up as much as possible.

Academic courses relevant to the project: Cloud Computing, Advanced Operating Systems.

PS-II Station:Saras Analytics – Non-Tech, Hyderabad

Faculty

Name: Prof. Ambatipudi Vamshidhar

Student

Name: PRAGYAN SHUKLA(2016B1A40954H)

Student write-up

Short summary of work done during PS-II: Worked in CRO (Conversation Rate Optimization) which involved daily monitoring of client assets and using data analysis to provide recommendations in order to increase the revenue of client assets. Also worked on UI/UX design mockups of multiple assets.

Tool used (Development tools - H/w, S/w): Google Analytics, Big Query, MS Excel, Google Data Studios, Photoshop(for design mockups).

Objectives of the project: Using CRO to provide recommendations to increase revenue/conversion rate of client's assets.

Major learning outcomes: A better understanding of CRO, UI/UX and business aspect of ecommerce sites.

Details of papers/patents: Not any

Brief description of working environment, expectations from the company: Highly nurturing environment, where everyone is ready to help you and push you to improve further. Everyone is friendly.

Academic courses relevant to the project: Not really

Name: M. KOUNDINYA(2017A1PS0875G)

Student write-up

Short summary of work done during PS-II: I have taken up BAU tasks for my team. Other than BAU'S, I have worked on dashboard creation works for my team.

Tool used (Development tools - H/w, S/w): SQL, BIG QUERY, PYTHON, Power BI, Data Studio, Google Analytics.

Objectives of the project: 1) BAU tasks for my team2) Created various dashboards for different assets that the company deals with.

Major learning outcomes: Learnt SQL, Python.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Best enviroment to learn, I had no prior experience in this field before this intern. My team had helped me great deal in improving my skills/learnt new skills etc. Definitely a good place to learn.

Academic courses relevant to the project: None.

Name: PENTA ESWAR(2017A2PS1526H)

Student write-up

Short summary of work done during PS-II: Business analysis and creating dashboards for the product using Backed data.

Tool used (Development tools - H/w, S/w): BIG QUERY, Power Bi, Google Analytics, Excel, DBeaver.

Objectives of the project: Business analysis of 3 companies, dashboard for the back-end data of the product.

Major learning outcomes: How to analyse companies business strategy, making raw data into useful data and creating dashboards using the data.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Saras analytics is a data management and predictive analytics company focused to solve your data challenges. By leveraging the solutions, customers can get a view of their business data with comprehensive reports and dashboards in a fully managed data warehouse.

Academic courses relevant to the project: NA

PS-II Station:Saras Analytics - Tech, Hyderabad

Faculty

Name: Prof. Ashish Narang

Student

Name: HARSH PATERIA(2017A7PS0129H)

Student write-up

Short summary of work done during PS-II: I worked on the SaaS software DATON and developed functionalities related to it. My work also involved fixing the bugs during production and deploy it. I also developed a connector for an e-Commerce source and worked on the payment history component on the website.

Tool used (Development tools - H/w, S/w): Postman, IntelliJ Idea, VS Code, REST, KOTLIN, Angular, Java, JavaScript, TypeScript.

Objectives of the project: My project involved developing a payment history component for the website and developing connector for e-Commerce source to be added as functionality to website.

Major learning outcomes: Learnt how to work in a team, plan and finish tasks before the deadline. Learnt how to manage time efficiently and communicate effectively.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The team I worked with was very helpful and helped me at all times during the course of the internship. The colleagues are very supportive in times of need. The work of the DATON team is to design new functionalities and to fix bugs and issues that occur during production. The onboarding is smooth and the company gives sufficient amount of time to learn and implement things.

Academic courses relevant to the project: Software Engineering, OOPS, DBMS.

PS-II Station:Sattva Media & Consulting Pvt. Ltd., Bangalore

Faculty

Name: Prof. Dinesh Wagh

Student

Name: KUMAR SUYASH RITURAJ(2019H1490832P)

Student write-up

Short summary of work done during PS-II: Delivering Customer Success: Facilitating in client onboarding on Sattva's in house program management product - SHIFT.

Data Analytics: Facilitating in client data uploads on the product, creating visualizations and dashboards for assessment of social impact done through the CSR projects undertaken by the clients.

Tool used (Development tools - H/w, S/w): Excel, Zoho Analytics, Jira.

Objectives of the project: Delivering customer success at Shift and monitoring social impact through data analytics.

Major learning outcomes: In depth exposure to real life social impact data which lead to give better understanding of the social impact sector, data analytics, BI, program management in general. Client requirements and delivering proposal to manager lead to enhancement in communication and negotiation skills. Teamwork, coordination and its importance in reducing TAT.

Exposure to new softwares: Shift, Jira, Zoho Analytics.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work environment - Extremely friendly and cordial working environment with plenty of support from team leads and managers.

Company expectations - Background in product management and data analytics.

Academic courses relevant to the project: Courses on data analytics.

Name: AKANKSHA PANWAR(2019H1490855P)

Student write-up

Short summary of work done during PS-II: The role is majorly of CSR consulting, program management. My daily work involves working with datasets, secondary research, report making, deck making, insight building, team work, program management, handling client's CSR work, due diligence, compliance, providing expertise for various social interventions etc. Partner work monitoring and guidance.

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

Objectives of the project: To achieve higher goal of the company of creating social impact in the society.

Major learning outcomes: Learnt team work, face to face client requirement gathering, user cases, report making, program management, monitoring.

Details of papers/patents: Not any

Brief description of working environment, expectations from the company: Very good working environment, supportive and humble people, flat system, transparency.

Academic courses relevant to the project: Yes, little bit, knowledge about CSR was very useful.

Name: NISARG SNEHALBHAI BUCH(2019H1490868P)

Student write-up

Short summary of work done during PS-II: Major work revolved around the product itself, starting from onboarding a client, training their partners & users, resolving the bugs/glitches, training the internal team, setup of their projects as per the portfolio, proper management of their funds & beneficiary data, using data analytics to generate the actionable insights for the client, constructing a meaningful wireframe for the dashboard, and finally designing the dashboard for different level (project, program, portfolio) for various clients using Zoho analytics. I personally worked on number of client's whos funding is worth 25 Cr& designed no less than 60+ dashboards. Also, crafted a way to decrease TAT for a process by more than 50%.All of these while taking care of product updates, drafting assets for each stage of the product (Lead, Sales, Onboarding, & Updates) and updating the same on the firm's knowledge management portal. Proposed an optimal solution for upgradation of the process using various tools using market research, negotiation with the vendor & automating the whole feedback loop

process. Overall, great work satisfaction & very apt use of different management skills and concepts to optimize product management unit & achieve customer success.

Tool used (Development tools - H/w, S/w): JIRA, Zoho Analytics, Slack, Tableau, MS Office.

Objectives of the project: Successfully streamlining & achieving customer success by optimizing product performance & resources at Sattva media & consulting.

Major learning outcomes: Following are the major part of learning in this organization:

- Getting to know about CSR & social sector in depth. (LFA framework, Laws, Program management)
- Product management experience including onboarding a client, training the resources, resolving bugs & queries, increasing the efficiency, decreasing the TAT, stakeholder management, etc.
- Handling 5 major client worth INR 50cr budget & 50+ projects on product & streamline their functioning by understanding the requirements but client team of 15+ members.
- Proactive experience of customer success for early-stage SaaS solution & its framework, governance & compliance.
- Co-ordinating with the product team in order to create from scratch & deliver all the asset related to the product for client & sattva users at BU level.
- Importance of impact on ground & how it plays a role in social sector.
- Creating a project, working understanding a wireframe for dashboards, grasping multiple interlinking features of Zoho, SHIFT, Google form, Jira & Slack.
- Gained skill-set in the field of market research, business communication & negotiation while dealing with the vendors, understanding requirements, communicating the same & delivering the proposal to the manager.
- Data analytics, Data visualization, Planning Framework, smoothly running Program management software, Data collection software.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work environment - It's pretty engaging, evolving, great for a start. Work-life balance is highly taken care of and the firm cares a lot about their employees. Nice work culture, flexible timings,

encouraging environment, talented colleagues, very understanding & dynamic leadership, elevated work satisfaction, adequate professional and personal growth opportunities. Crystal clear on their values and commitment to social sector & towards their client. Overall, a very good place to work with.

Expectations from the company - Company provides a very healthy working environment as well as very good work life balance. Appreciation will always be given for your sincere efforts, apt guidance for growth & immense learning opportunities provided. Pulls out the leader in you by pushing you to take initiatives.

Academic courses relevant to the project: Marketing, Quantitative Methods, Marketing Research, Project Management, Product Management, Negotiation Skills, etc.

PS-II Station:Securework, Hyderabad

Faculty

Name: Prof. Preeti N.G

Student

Name: MOHD AKRAM(2019H1120063P)

Student write-up

Short summary of work done during PS-II: There is one module in the current architecture which can be eliminated by re-design. This elimination will enhance the efficiency of the whole architecture. I am working on this and testing how much improvement do we get.

Tool used (Development tools - H/w, S/w): Java Web Services, Java Programming, JavaScripts.

Objectives of the project: Re-design of the complete architecture.

Major learning outcomes: Teamwork, Technologies like Java Web Services.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Work from home and work culture is great.

Academic courses relevant to the project: Cloud Computing.

Name: LIMBURKAR SHRIYA GIRISH(2019H1120067P)

Student write-up

Short summary of work done during PS-II: Work was focused on the user stories assigned within the team. It was first focused on the understanding of different components handled by the team, get familiarized with the front-end and back-end code and solve smaller bugs. I worked on 3-4 bugs and then started working on user enhancements. I worked on 2 major enhancements during the internship and both are tested and currently deployed in production environment.

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

Technologies used: Java Spring, Java Hibernate, MySQL database for backend, Ext JS, Ajax and jQuery for frontend and Jenkins, Docker, Kubernetes, AWS for build and deployment.

Objectives of the project: Manage the existing core services of the counter threat platform and work on the new user enhancements.

Major learning outcomes: Learnt restful web services, Java Spring and Hibernate frameworks in depth from web development point of view. Learnt about CICD pipelines and build, deployment process using docker and kubernetes.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The team was very supportive and we had full freedom to voice our opinions and ideas while working on the enhancement. Daily scrum calls would help us keep our manager updated on the progress of the user story. Collaborating with other teams was also easy. The team had Spring Demo/overview sessions at the end of every spring to understand and review work done by all the developers in the team. The team also had bi-monthly sessions where one team member would present a new technology he learnt in that month.

Academic courses relevant to the project: Object Oriented Analysis and Design, Software Architecture, Cloud Computing.

PS-II Station: Servicenow Software Development India, Hyderabad

Faculty

Name: Prof. Chennupati Rakesh Prasanna

Student

Name: NAND BHARAT PARIKH(2019H1030022G)

Student write-up

Short summary of work done during PS-II: Designed and developed chatbot conversations for the users to enable day-2 operations like start, stop, terminate and describe on the virtual machines provided to them via ServiceNow virtual agent chatbot. This involved backend development including REST API calls, creating parsers and doing cloud resource management.

Tool used (Development tools - H/w, S/w): Eclipse IDE, Google Chrome, Maven, REST API, JavaScript.

Objectives of the project: Developing chatbot conversation for the company chatbot to handle virtual machines hosted on AWS and Azure.

Major learning outcomes: Learnt how to work cooperatively when a lot of stakeholders are involved in a inter-team and intra-team environment. Presenting and pitching while giving demos for the product and developing the product with keeping the customer use in mind.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Extremely friendly working environment. Colleagues are always ready to help or solve the doubts. Company always encourage to learn more about technology and how it can be used to solve real life problems. The expectation is reasonably high due to numerous perks and as the work involves product development, demands good presentation skills.

Academic courses relevant to the project: Object Oriented Programming, Data Structures and Algorithms, Operating Systems, Computer Networks, Database Management System, Machine Learning.

Name: PRAKHAR YADAV(2019H1030032G)

Student write-up

Short summary of work done during PS-II: I was involved with two teams, both working on employee portal, a product that the company offers. Internship involved working on accessibility issues and ensure the employee portal meets WCAG 2.0 & 2.1 compliant. WCAG (web content accessibility guidelines) are a set of recommendations for making web content more accessible, primarily for people with disabilities—but also for all user agents, including highly limited

devices, such as mobile phones. This required knowledge of Javascript, AngularJS, HTML & CSS. In general the tasks that were assigned from time to time were not restricted to development. I also was involved in testing once the product development phase was done, to find out any & all the bugs that might come up (called bug-blitz). Followed by fixing the bugs. The company has a very systematic approach towards development and rigorous bug fixing (as there were 3 iterations of bug-blitz). It is always recommended to keep your code changes and all the work done so far written somewhere so that if similar things pop up then they can be referred and completed in no time. Also keep a general daily journal where all the work done and to be done are taken note of. OneNote is a preferred tool used throughout the organization to keep note of all the things.

Tool used (Development tools - H/w, S/w): ServiceNow Platform (web based), IntelliJ IDE, Eclipse IDE, VS Code.

Objectives of the project: Ensure product is WCAG compliant.

Major learning outcomes: JavaScript, AngularJS, Agile development, Accessibility, WCAG principles & importance.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment is good. Teams are very helpful when you get blocked they'll readily help you to overcome and keep moving. A mentor will be assigned for the duration of the internship. The internship starts by taking the essential quick courses about the platform, followed by making a learning project and then soon enough you'll be doing all the tasks that the team is currently working on and you won't feel like an intern. It's a great experience as you'll learn a lot and see for real what to expect when you'll join. Managers are very understanding and everyone is polite. You'll be pushed to develop leadership skills and take responsibility for any tasks, which is fun. There are biweekly fun meetups with games and also 1-on-1 meetings with manager where your feedback will be taken and any discussion that you want will happen. The people & environment is very professional and friendly at the same time. It is expected that the person show diligence, sincerity, honesty and rest of the needs will be looked after by the managers & administration.

Academic courses relevant to the project: None

PS-II Station:SiA Digital Consultancy India Pvt. Ltd., New Delhi

Faculty

Name: Prof. R. Bharati

Student

Name: P. SWETHA(2019H1460164P)

Student write-up

Short summary of work done during PS-II: Throughout the 6 months of internship, I have worked on various projects. I have worked as Competitive Intelligence (CI) intern. Beginning days of internship was introductory to work environment, and work types. Further we started off training, and meeting with our team lead on daily basis. Started the work with basics of data collection and CI. I have worked on data collection in CI for client projects. I have made company profiling, opportunity assessment, quarterly earnings call updates, market assessment, disease profing and my major project was also a part of clients work in our office. I was being occupied with work everyday of our 6 months. I have developed my skills in presentations for clients, data processing, data collection and storage.

Tool used (Development tools - H/w, S/w): Presentations and excel.

Objectives of the project: To conduct opportunity assessment in psilocybin space to guide strategy for setting up new psychedelic focused company. Also, to identify key potential investors in the field for initial investment.

Major learning outcomes: Competitive intelligence, presentation skills, data collections, processing and storage.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The company has very good, supportive and interactive working environment. I was also invited to participate in meetings that were not of pharmacy related. Departments were open to provide knowledge and work if interested in. The team lead has supported and guided me patiently throughout my PS journey and had great learning experience under the guide. The superiors of the company have been supportive and motivating throughout. Everyone treats you as their own inspite of just being an intern. There is no hierarchical differentiation, providing voice to everyone in the office. Timings of the office is very convenient too. Overall, office has friendly environment and a great learning exposure to anyone interested in any departments.

Academic courses relevant to the project: Not actually

PS-II Station:Silicon Laboratories, Inc., Hyderabad

Faculty

Name: Prof. Kranthi Kumar Palavalasa

Student

Name: KOTTURI VENKATA SAI TEJA(2019H1230049H)

Student write-up

Short summary of work done during PS-II: Started with design of rail to rail op amp buffer then inductor layout, simulations and then top level simulations of a chip.

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

Objectives of the project: To design a rail to rail buffer to drive the VGA output to the oscilloscope to test the VGA output signals.

Major learning outcomes: Rail-to-rail buffer design, inductor layout and other layout related things, top_level simulations setup in Cadence software.

Details of papers/patents: NIL

Brief description of working environment, expectations from the company: The work environment is good. We will be assigned a mentor who will be providing guidance throughout. Some task will be assigned to us and will be given sufficient amount of time to complete that. Overall, its nice experience.

Academic courses relevant to the project: Analog IC Design, RF Microelectronics.

PS-II Station:Snap Deal, Gurgaon

Faculty

Name: Prof R. K. Tiwari

Student

Name: KARTIKEYA SHARMA(2017A3PS0290P)

Student write-up

Short summary of work done during PS-II: Even though my role was of product analyst intern, I did all the work as product manager(PM) would do. I worked under a PM. They gave

me analysis, design, creating features, suggesting changes to existing features and some other work. I was mainly involved in 'warranty programme' project.

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

Objectives of the project: Launching Snapdeal warranty.

Major learning outcomes: SQL, Analysis, Excel, Teamwork.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The mentors and managers are friendly and approachable. They give us lot of work which is good for our overall learning. They are always ready to help and guide us the whole way. They expect us to give our inputs wherever possible. You would be involved in few projects and would always have something to do.

Academic courses relevant to the project: SQL – RDBMS.

Name: REETIK RANJAN(2017A4PS0602P)

Student write-up

Short summary of work done during PS-II: Analytics and performance tracking of key User Acquisition metrics to optimize marketing spends and net margin earned per order.

Tool used (Development tools - H/w, S/w): SQL, MS-Excel, Google Ads.

Objectives of the project: Optimizing the performance marketing campaigns being run through Google Ads and increasing the efficiency of App Install campaigns.

Major learning outcomes: Developed an understanding of data analysis and generating business insights based on the analysis. Understood the effect of business decisions in the contribution margin of the company. Preparing analytics reports and communicating the insights generated to the senior leadership.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work environment was chill. The manager (and other co-workers) gave sufficient time to work on the assigned tasks and were always ready to provide help. Even in the WFH environment, we had regular meet-ups to brainstorm on the insights generated.

Academic courses relevant to the project: Probability and Statistics.

PS-II Station:Sona Comstar, Gurgaon

Faculty

Name: Prof. Nithin Tom Matthew

Student

Name: TANUJ DEBASHISH BANERJEE(2019H1060527P)

Student write-up

Short summary of work done during PS-II: Sona Comstar came to our campus for the first time. Understandably there is no specific provision for accommodating people on a Pre-PGET basis. So a lot in the grey area. Work assigned to us is related to understanding the core concepts of design in bevel gear and die design. Sona Comstar's precision forging technology is very different from the traditional approach of manufacturing bevel gears. So understanding the teeth face design from a forming point of view was the crux of my work.

Tool used (Development tools - H/w, S/w): Solid Edge, NX.

Objectives of the project: Understanding the correlation between the design parameters of a forged bevel gear.

Major learning outcomes: Industrial approach towards new product development.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work culture over here is not at all related to corporate culture. This is a manufacturing firm and doesn't give WFH so easily. A lot of work includes getting your hands dirty as a mechanical engineer. From the HOD to the sectional engineer, everybody is as helpful as possible, given that you are not coming between their assigned work.

Academic courses relevant to the project: FEM, CAAD, MD.

Name: SHIVAM AGARWAL(2019H1410591P)

Student write-up

Short summary of work done during PS-II: Conceptualized and designed an electronic locking differential for a north american electric vehicle manufacturer from future business point of view.

Tool used (Development tools - H/w, S/w): Solid-Edge, Msc-Nastran, Kiss-Soft.

Objectives of the project: To design a new product based on some initial study and benchmarking of the already existing products in the same segment.

Major learning outcomes: It was a rich experience altogether. I learnt a lot about important concepts and mechanics of a typical driveline and transmission system in the IC engines based vehicles.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment was very positive. There was certain amount of autonomy given, keeping in mind the importance of this project, so that one would not get involved in the other day-to-day work of the company. Weekly presentations were taken by the senior management keeping a tab on how much progress would we reach every week and the same was passed on to the customer for whom we were developing this new product.

Academic courses relevant to the project: Design of Mechanisms, Strength of Materials, Computational Fluid Dynamics.

PS-II Station: Symphony Fintech Solutions Pvt. Ltd., Mumbai

Faculty

Name: Prof. Nishit Narang

Brief write-up on PS-II station : While our PS-II students are normally well equipped w.r.t technical skills and theoretical fundamentals, there is a need to be better equipped on some of the soft skills. In the Industry, projects are executed as a Team and not as an Individual. Hence, Teamwork is utmost important. This cannot be achieved without proper project management practices, including following all status reporting and communication practices and demonstrating a proactive approach. Many students lag on this aspect. Hence, a specific course on Project Management practices to educate PS-II students on the key practices and procedures are necessary, especially during the Work-From-Home (WFH) period.

Student

Name: BAKUL AGRAWAL(2019H1030511P)

Student write-up

Short summary of work done during PS-II: Developed a GUI, using C# winforms and MySQL to store the related data, to allow admin users to configure instances for the services/components in order to distribute the load for each service, in the ongoing live project.

Tool used (Development tools - H/w, S/w): Tools for development - Visual Studio, MySQL Workbench, C# language

Tools for testing - Visual Studio, Redis servers, MySQL server

Tools for communication - Skype, Gmail

Objectives of the project: To enhance the ongoing project as into distribute the load among the various instances for each service.

Major learning outcomes: Learnt new technologies and professionalism.

Details of papers/patents: None

Brief description of working environment, expectations from the company: WFH was a new experience for everyone. To work from home, communication between all the company employees and especially the team assigned to work with was the main factor to maintain common outcome and to work smoothly. This was achieved by using skype - chats and calls, frequently. Overall, a good working environment was provided, could have better too.

Academic courses relevant to the project: Majority of the courses were relevant like all the programming-related courses, database courses, and some more.

PS-II Station:TATA Communications Ltd., Chennai

Faculty

Name: Prof. Manoj Subhash Kakad

Student

Name: KRISHNAM BAJAJ(2016B2AA0528G)

Student write-up

Short summary of work done during PS-II: 1. Developing Custom Plugin Screens for Kibana using the data stored in ElasticSearch for ease in analysis of Logs. Filtering the data based on ElasticSearch Queries with filters like TimeStamp, Host, Process etc.
2. Configuring Nginx and Varnish server for inclusion of unique trace ID for every request passing through different layers of the content delivery network.

Tool used (Development tools - H/w, S/w): ReactJs, NodeJs, ElasticStack, SQL.

Objectives of the project: Building web apps for the team for internal use and configuration of servers.

Major learning outcomes: Web Application Programming. Languages such as ReactJs, NodeJs, programming API's, Nginx, Varnish.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment of the company was quite good, though the PS was WFH still we could see the office culture. Everyone was very helpful especially our manager. The organisation is very large with lots of employees still the management was quite good and take care of everyone.

Academic courses relevant to the project: Object Oriented Programming.

PS-II Station:Techmojo, Hyderabad

Faculty

Name: Prof. Y. V. K. Ravi kumar

Student

Name: AMIT PADALIYA(2019H1030013G)

Student write-up

Short summary of work done during PS-II: Created scalable and extensible backends with best practices of software engineering.

Tool used (Development tools - H/w, S/w): IntelliJ, Java, Apache Maven, Spring Boot.

Objectives of the project: Create full stack web apps that fulfill the client need and give him perfect satisfaction.

Major learning outcomes: Making erd diagrams, designing high level, low level, object oriented software design and best programming practices.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Meet the scheduled tasks on or before time, be prompt, take responsibility and help other employees.

Academic courses relevant to the project: Advanced algorithms, operating systems, Advance software architectures.

Name: GHODKE PRATIK PRAVIN(2019H1030558G)

Student write-up

Short summary of work done during PS-II: I started with learning new technologies, frameworks and languages like Spring framework, Spring boot, Spring batch, Apache Kafka, ActiveMQ, and more than that I was looking into code base. New joinees were given brief idea about the software and the business aspects of it. After getting familiar with the codebase and getting to know the technologies used in project my team was working on, I got assigned to smaller bugs. Gradually I was assigned to some modification tasks in existing code and then adding small features in a software. Overall, it was a nicely structured process of learning and then applying those things in work. My team and college mentor were so helpful throughout the internship. I am very grateful for the opportunity I got.

Tool used (Development tools - H/w, S/w): Spring framework, Spring boot, Spring batch, Apache Kafka, ActiveMQ, Java, javaScript.

Objectives of the project: NA

Major learning outcomes: I learnt spring framework, spring boot, apache kafka, more than learning technologies I got familiar with industrial working culture and increased my communication skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work culture is so supportive here, every one is so helpful. Expectation wise one should be aware of Java and database concepts. More than that u should be keen to learn new things. If I got stuck in learning new things or any tasks my team mates were there for me always.

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

PS-II Station:Tekion India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Pradheep Kumar. K

Student

Name: PAVITRA GAUTAM(2016B2A10695P)

Student write-up

Short summary of work done during PS-II: Made a web application for booking seats for Tekion employees in different facilities. Along with seat reservation service, employee management, team management and facility management services were also developed.

Tool used (Development tools - H/w, S/w): React, Node js, VS Code.

Objectives of the project: The project “Seat Reservation System” aims to provide seat reservation functionality to tekion employees working at offices.

Major learning outcomes: Front-end web development.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is good. People are friendly and very helpful.

Academic courses relevant to the project: DSA, OOP.

Name: DEVENDRA TOSHNIWAL(2019H1120059P)

Student write-up

Short summary of work done during PS-II: I got to build an entire website development from Scratch. I worked as a Frontend developer to build this project. The name of the project floated to our team was approval flow management. We have designed the screens in the best possible way to make that looks good and that can fit for the given requirements.

Tool used (Development tools - H/w, S/w): React JS, Redux, Postman, Git, etc.

Objectives of the project: To build an approval flow management for the internal employees of the company.

Major learning outcomes: Frontend development using React JS.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment is really friendly and the team members and mentors help you in every step of the way.

Academic courses relevant to the project: Nothing in particular.

Name: SHAH RUTVIK PRAKASHKUMAR(2019H1120179P)

Student write-up

Short summary of work done during PS-II: During the internship period, I was involved in work revolving around exploring vehicle services textual data, applying machine learning models on them. My project was concerned with multi label service classification using historical service datasets.

Tool used (Development tools - H/w, S/w): Tools - Jupyter Notebook, VS Code
Language - Python

Objectives of the project: Service classification - Building an ML model utilizing the capabilities of historical vehicle service datasets, to categorize service descriptions into standardized service names. Model should be able to label multiple service names precisely.

Major learning outcomes: For an NLP task, how to deal with untidy data from scratch- identifying relevant columns, preparing labelled dataset, cleaning it. Applying word embedding models, visualizing and fine tuning them further. Using traditional as well as neural network based models to classify text. Calibrating models, analyzing and comparing model results and finding out the best suitable model for production. Enhanced domain knowledge - automotive industry. At the end, we were able to develop a complete pipeline to tag service descriptions in a highly precise manner.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Data Science team manager and mentor are very experienced and have good domain knowledge also. They are helpful and working under them will surely help you learn a lot. Sometimes working hours may stretch too meet weekly deadlines. Overall, the work environment is very rewarding and professional, given you are ready to put in effort to learn and work.

Academic courses relevant to the project: Machine Learning

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

Faculty

Name: Prof. Y. V. K. Ravi Kumar

Student

Name: FAISHAL HUSSAIN SIDDIQUI(2019H1030012H)

Student write-up

Short summary of work done during PS-II: I had very little experience and knowledge about cloud technologies prior to joining Teradata. During my internship, I learnt a lot about cloud technologies and their applications. I also learnt about infrastructure provisioning and configuration in cloud using automation languages such as Terraform and Ansible, during the internship. I worked in Teradata as a part of Multi Cloud site provisioning team which is responsible for initial configuration of Teradata vantage. In the organisation, I took the initiative to automate various manual steps that are needed to be performed by the support team, which resulted in saving hours of effort from their side. I gained valuable industry experience and was able to translate my theoretical understanding to practice. This internship has been really exciting and resourceful. I learnt many things and made some mistakes nevertheless, I am looking forward to make the best out of this whole experience.

Tool used (Development tools - H/w, S/w): AWS, GCP, Azure, Ansible, Terraform, Python, BASH.

Objectives of the project: Multicloud Provisioning and Automation for Teradata Vantage.

Major learning outcomes: I learnt cloud technology and automation, scaled Agile framework for collaboration, working as part of team and taking initiatives, developed self confidence and translating theoretical understanding to practice.

Details of papers/patents: Internship consists of working in various projects related to multi cloud site provisioning and automation.

Brief description of working environment, expectations from the company: The work environment was very supportive and people were easily reachable. During pandemic, the company kept in check not to overburden the individual and provide mental, financial support to the employees in need. This displayed company really cares and respects its employees. I was very happy to be part of such organisation.

Academic courses relevant to the project: Cloud, Data Structure and Algorithms, Operating Systems.

Name: KUMAR ANAND(2019H1030500G)

Student write-up

Short summary of work done during PS-II: Initial one and half months: training sessions, tutorial docs.

Remaining duration: Root cause analysis of bugs/issues and resolution of the bugs and not mentioned the details of the bugs due to confidentiality reasons.

Tool used (Development tools - H/w, S/w): Jira, MobaXterm, ServiceNow, WinSCP, Github.

Objectives of the project: Bug analysis and resolution.

Major learning outcomes: Opportunity to work on Object Oriented Programming concepts, Operating System concepts, got familiar with tools like Jira, MobaXterm.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work environment is quite conducive to the learning goals of the students. Initially, students are given

proper training in the form of live sessions, recorded sessions, web-based training, and tutorial documents. Once the student is comfortable with the basics of the project in which she is working, she is assigned minor bugs to work on, in the beginning. Thereafter, bugs with increasing levels of difficulty are assigned to work on. Throughout the internship duration and ever after, team members are quite supportive and always willing to help the intern if she gets stuck somewhere. The student is expected to meet the deadlines of the assigned task.

Academic courses relevant to the project: Advance Operating System, Network Programming.

PS-II Station:Texas Instruments (I) Pvt. Ltd., -Analog, Bangalore

Faculty

Name: Prof. Satya Sudhakar Yedlapalli

Student

Name: KSHITIJ ARORA(2017A3PS0197P)

Student write-up

Short summary of work done during PS-II: In data converters, the precision and accuracy of reference voltage is of utmost importance. So, in my project, I had to design a high speed - low error - low noise buffer, which would then be utilized by a Telemetry ADC in an upcoming Texas Instruments IP.

Tool used (Development tools - H/w, S/w): Cadence Virtuoso Tools, Verilog-A.

Objectives of the project: To design a reference voltage buffer for Telemetry SAR-ADC.

Major learning outcomes: Tradeoffs involved in analog circuit design, learnt how IC design projects are taken up and implemented in the industry.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: As the internship was WFH mode, the working hours were flexible. The mentor and other co-workers are very helpful and approachable. Interactions with other team members and interns were always encouraged.

Academic courses relevant to the project: Analog and Digital VLSI Design, Electronic Devices, Analog Electronics.

Name: ADITYA AGRAWAL(2017A3PS0201P)

Student write-up

Short summary of work done during PS-II: I worked on the design and development of a Matlab based music efficiency calculator for the audio amplifier chips. To model the chip in Matlab, first the functioning of an audio amplifier was studied and understood. Then, various algorithm scripts were written in Matlab to imitate the individual component of audio amplifier such as boost converter, class D amplifier, and finally a main control algorithm was written which controls the functioning of the complete model. For calculation of efficiency, various power losses such as conduction loss, overlap loss etc. were studied and mathematically modeled to get the efficiency of the design. After completion of scripting for the model, it was run and checked for the values that it was predicted. To verify the accuracy of the model, its results were compared with the actual on silicon fabricated IC.

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

Objectives of the project: To develop a software tool which can help to predict the efficiency of an audio amplifier in design phase and in minimum time.

Major learning outcomes: I learnt about the operation of class D amplifiers, boost converters and what are the losses involved in the functioning of these components. Overall, it gave me a good experience on power electronics and audio amplifying chips.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment was very good. Team members were very supportive and I learnt many new concepts from them. As being an online internship, most of the conversation was over the calls and online meetings, but mentor and team tried to provide me with the sufficient knowledge and support required to complete the project.

Academic courses relevant to the project: Power Electronics, Analog Electronics.

Name: JASDEEP MEHNDIRATTA(2017A3PS0216G)

Student write-up

Short summary of work done during PS-II: Development of a finite state machine and implementing it in system test cases to find bugs in the design. Using it for manual verification of the design and verification of PMBus.

Tool used (Development tools - H/w, S/w): SimVision, viva, virtuoso.

Objectives of the project: The aim of the project is to develop a Finite State Machine (FSM) based on our e-fuse device and use it for the purpose of design verification. The next step would be to clean up the FSM for any errors or illegal states. A clean FSM would then be used

to implement the system test cases in order to find bugs in the design. FSM would be helpful in performing manual verification.

Major learning outcomes: Verification, UVM, SystemVerilog.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Good work environment. Flexible timings because of WFH. Everyone is always ready to help and team members realize that we are there to learn. Projects are assigned to you. There is a midterm presentation where you highlight all the work that you have done.

Academic courses relevant to the project: ADVD, Digital Design, Microelectronic Circuits.

Name: R. HARIRAM(2017A3PS0373G)

Student write-up

Short summary of work done during PS-II: The work comprised of improving IC qualification and reliability simulations through different methods - involving PCB parasitic extraction through multiple software and determining the ideal flow for suitable for qualification. The next stage was developing board component models to be included in simulations, through verilog-AMS and getting the models as accurate as possible. Scripts were also developed to automate using these two methods in simulation.

Tool used (Development tools - H/w, S/w): Cadence environment, Verilog-AMS, ANSYS EM suite, Python.

Objectives of the project: To facilitate physically accurate IC qualification simulations.

Major learning outcomes: Learnt about the use of qualification test to determine an ICs quality, PCB parasitics, test failures due to parasitics, and accurate component modelling.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Being WFH internship, the work was well managed and designated with reasonable deadlines. Thorough introduction to the concepts that were dealt was given, along with the required training needed to complete the tasks. Being an R&D project, the inputs and ideas from my side was also welcomed and encouraged.

Academic courses relevant to the project: Electrical Sciences, Analog & Digital VLSI.

Name: POORVI AMIT RAO(2017A3PS0921G)

Student write-up

Short summary of work done during PS-II: The project was a part of larger project that aimed at building a full automated testbench for Analop IP tests, to reduce testing time and increase flexibility. My part was to build the module that acts as interface between ADC on bench and the microcontroller, using an FPGA. And to make the code modular so that each time a new ADC is used for testing, there is no need to rewrite the entire FPGA logic for interfacing.

Tool used (Development tools - H/w, S/w): FPGA Board, Xilinx Vivado, Verilog.

Objectives of the project: The project aims at developing a modular solution for interfacing high speed ADCs with microcontroller with the help of an FPGA to reduce testing time so that multiple ADCs can be connected to the same board with minimum software changes.

Major learning outcomes: Learnt end to end FPGA design development - from ideation and coding to implementation in hardware for a real world application.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment in TI is great. All the team members are very knowledgeable and always willing to help. You can freely reach out to anyone in the organization and they will surely help you out. You will get to learn a lot by working with TI.

Academic courses relevant to the project: Digital Design, ADVD (Digital part).

Name: LAKSHAYA MAHESHWARI(2017A8PS0616P)

Student write-up

Short summary of work done during PS-II: A new signal chain is proposed for optical Particulate Matter (PM) counters. The project focused on understanding system requirements of PM counters and relate it to OPAMP technical specifications. A new signal chain has been designed using high speed amplifier for desired PM counter specifications.

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

Objectives of the project: Upgrade an already existing TI signal chain for PMcounters using high speed amplifiers.

Major learning outcomes: The project helped to understand about system design, i.e. relating system requirements to OPAMP specifications for choosing the right OPAMP. During the project, learnt about stability analysis, removing potential instability causes, noise analysis and ADC driver requirements.

Details of papers/patents: An application note has been prepared on proposed design to serve as a design reference guide for PM counter signal chain.

Brief description of working environment, expectations from the company: The people at Texas Instruments are very cooperative, helpful and encouraging.

Academic courses relevant to the project: Analog Electronics.

Name: SHREYAS MURTHY(2017AAPS0367G)

Student write-up

Short summary of work done during PS-II: My work was about exploring 2-3 techniques that can reduce the effects of low frequency noise on an ADC's performance. There are standard techniques available to reduce effects of high frequency or thermal noise. The same techniques can technically be used to handle lower frequency noise also, but there is large amount of time and power consumed, so it is not feasible. The idea I implemented was to modify the operations of an ADC, to make low frequency noise appear like high frequency noise. This way the techniques we use to handle thermal noise can take care of low frequency noise also. I learnt how errors and noise patterns in an ADC can be identified by looking at the frequency spectrum of the ADC output.

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

Objectives of the project: How to reduce the effects of low frequency noise on an ADC's performance.

Major learning outcomes: Better understanding of each component of an ADC, how errors in the components can be traced by analyzing the ADC output. I learnt how to modify the ADC behaviour to handle different types of noise present in the ADC. I also learnt how to efficiently model a pipelined ADC to handle noise and errors present in its components.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work was online throughout and had great mentor. We used to have around 2-3 discussions / week in the first 2 months. First month, my mentor guided me through the basics of the work, asked me to run simulations and get back to him. The third month onwards, we moved to the project, and our discussions took longer upto an hour, and we interacted every alternate day. There was an expectation that I report to him via mail the work I did every day or every alternate day, even if I couldn't complete the simulations he asked for. This way we kept track of the progress. We had 3 ideas in mind, and we implemented them in the last 3 months. I didn't interact with other people of his team. At the end, I compiled all my results and mailed it to him along with summary of the work I did throughout the project.

Academic courses relevant to the project: Analog Electronics, Digital Signal Processing, Signals and Systems.

Name: GAURAV RAJKUMAR SATTIWALE(2019H1230040H)

Student write-up

Short summary of work done during PS-II: The problem statement for my internship was "Bringing Up the USB 2.0 Compliance Setup". For any device or hub to be certified as USB device or hub, it has to pass the standard compliance test suggested by the USB implementer's forum. I was a member of test and validation team and hence my responsibilities include bringing up the setup to test for compliance and running the standard test on available devices and hubs so as to make sure the setup will be ready to test the actual device. I learnt the USB 2.0 protocol and its practical architecture during the internship. I made sure the arrangement of all the hardware required by the setup, the installation of standard software and the test fixtures. I was successful in bringing the compliance setup and was lucky to run the actual test on the company's silicon. Already many tests have been conducted and the device was passing them. This setup will be legacy contribution when the device will be certified as USB compliant.

Tool used (Development tools - H/w, S/w): 1) Keysight D9010USBC USB 2.0 compliance test
2) EHCI HSETT3) USB protocol suite.

Objectives of the project: The main objective was to bring up the compliance setup and accordingly performing tests on the standard USB devices and hubs. The consequent step was to perform these tests on the device from TI that is to be tested for compliance.

Major learning outcomes: 1) USB 2.0 protocol in broader aspect 2) The concept of compliance 3) The role of testing in industry 4) Bringing up a setup with knowledge of oscilloscope, probes, cables and test fixtures 5) The team culture to attain a common goal 6) Communication with the contractors and the vendors improved professional skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Texas Instruments makes sure you get the perfect exposure to the environment that you need to experience for starting your industrial learning. The discipline for work improves the efficiency and productivity. The team building activities make sure that you gel up with each and everyone very easily. The company makes sure you get access to each and everything in terms of learning. Apart from the internship, through project also got a chance to learn some extra information that may help in betterment of our career. The presentations on the regular intervals help you build your communication and professional skills. The ability to problem solving is specially focussed. Overall, nothing is compromised in terms of facility as my internship was smoothly conducted even though it was remotely conducted.

Academic courses relevant to the project: Embedded Systems, Digital Electronics.

PS-II Station:Texas Instruments (I) Pvt. Ltd., -Digital, Bangalore

Faculty

Name: Prof. Satya Sudhakar Yedlapalli

Student

Name: BHEEMREDDY PRANAVI(2017A8PS0466H)

Student write-up

Short summary of work done during PS-II: The project involves modeling a digital to analog converter with a provision to select a reference voltage, a gain setting and an offset. It has multiple blocks and multiple hierarchies. Non-linearity of the transfer function of the converter is a measure of the performance for this model.

Tool used (Development tools - H/w, S/w): Perl, Verilog AMS, Cadence Virtuoso, UNIX.

Objectives of the project: To make a DAC with gain and offset features. To measure its non linearity.

Major learning outcomes: Learnt to model and simulate in Virtuoso, automate using Perl, understood design and modeling concerns.

Details of papers/patents: NIL

Brief description of working environment, expectations from the company: Entire PS2 program was online. All people that I interacted my mentor, HR team members, other employees in the team were very helpful and friendly. Work timings were flexible. Multiple training programs were conducted. It was overall a great working experience.

Academic courses relevant to the project: Analog electronics, Digital design.

Name: MANISH DASH(2017AAPS0346G)

Student write-up

Short summary of work done during PS-II: TLV320ADC5140. A firmware code had to be written for deciding the values of the clock dividers used. A pseudo-code for this algorithm was written, which was then used as reference for writing firmware code. The main challenges encountered were the tradeoffs like area and the time taken. We had come up with atleast 6-7 different approaches from our discussions to try to solve the problem. However, some approaches did not work out or were creating more problems. Every failure was a learning and an encouragement to come up with a better solution. I had many discussions with my team members, and these discussions gave rise to many ideas. Finally, we could achieve some improvement in terms of achieving higher scalability by supporting more values of sampling rates and the data rates of the ADC with minimum tradeoffs.

Tool used (Development tools - H/w, S/w): Text editor for writing the firmware code, Shell scripting for automation of testing the design.

Objectives of the project: Improving the scalability of an existing ADC with minimum tradeoffs like area and time taken for execution.

Major learning outcomes: i) My concepts in Digital Electronics and Computer Architecture got revised and also I got a better clarity due to practical applications of the learning of these courses in my internship.
ii) Got some exposure to the professionalism and the work culture present in the company.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The internship was WFH throughout. But the people in the company were cooperative, interactive and helpful. My team members were available for discussions, which helped in arriving at different solutions to be tried out. The best thing was ideas were encouraged in the discussions.

Academic courses relevant to the project: Digital Design, Analog and Digital VLSI Design, Computer Architecture.

Name: ARJIT VERMA(2017AAPS0392G)

Student write-up

Short summary of work done during PS-II: The project involved creating a field-oriented control position tracking system for stepper motors. The initial stage involved learning about stepper motor basics and understanding their operation. The feedback loop was proposed to be closed using an optical encoder to identify the rotor position in real-time. A control system was designed using the error signal to actuate the position tracking. The FOC was done by manipulating the current phases at each sample time, such that the resultant current vector was perpendicular to the rotor position.

Tool used (Development tools - H/w, S/w): MATLAB, Motorware, Control Suite.

Objectives of the project: To implement Field-Oriented Control and Position Tracking on Stepper Motors.

Major learning outcomes: Stepper Motor Operation, System Design, Control System Tuning, MATLAB Simulations.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The mentors are very supportive and the team gives sufficient time and feedback. They conduct weekly meetings with the team panel, who give their ideas and feedback on the work done so far. The expectations are quite high, and the intern cannot lag behind in order to keep up with them. Getting clarity on the project objective from the very start is important, as often times it can be ambiguous on certain aspects. The team treats the interns like equal employees, and hence, the questioning can be vigorous. It is best to be clear on your own understanding of the project, and having a strong conceptual understanding helps in answering questions during the reviews.

Academic courses relevant to the project: Control Systems, Analog Electronics, Microprocessors and Interfacing.

Name: AJINKYA DHEKNE(2019H1230079P)

Student write-up

Short summary of work done during PS-II: I was assigned to learn the basics of Lint, CDC(Clock Domain Crossing) and setup the tools which will be used for further releases. I was also involved in automation related tasks which could help in reducing the time consumption of the long processes.

Tool used (Development tools - H/w, S/w): Linux Shell Scripting, Jaspergold CDC and Lint tools.

Objectives of the project: Setup Lint and CDC tools, help in automation.

Major learning outcomes: a. Basic Linux Scripting with AWK, GREP, SED, shell scripting
b. Basics of front end design overflow c. Basics of CDC and Lint tool setup process.

Details of papers/patents: No papers published

Brief description of working environment, expectations from the company: The working environment was friendly and everybody was open to help. My team was helpful and supportive. I expect that I will get to learn new technologies in a friendly environment.

Academic courses relevant to the project: Digital Design, CAD and Verilog.

Name: SUDHANSU SURANA(2019H1400537G)

Student write-up

Short summary of work done during PS-II: With the increase in demand for portable devices, it is necessary that the processor residing inside them should consume a minimum amount of power without affecting the device performance in terms of speed or efficiency. So as to attain the goal of low power dissipation, SOC power estimation is being performed at different levels of ASIC design cycle. The most initial level where a designer could look for power is RTL level. This ensures that there shouldn't be any surprises in later part of design cycle which generally results in huge turnaround cost.

Tool used (Development tools - H/w, S/w): Joules, Voltus, Spotfire, Genus.

Objectives of the project: To reduce the overall SOC power consumption so as to meet the architectural key spec requirements.

Major learning outcomes: Low power RTL design concepts.

Details of papers/patents: Unified Power Format (UPF) methodology in a vendor independent flow.

Brief description of working environment, expectations from the company: Texas instruments is one of the leading brands in semiconductor industry. It provides a vast opportunity to explore various aspects of analog and digital design fronts of SOC design cycle. Working under the guidance of highly skilled and proficient industry experts provides a platform to revisit the SOC design concept in details. Direct attention from mentors along with their thorough effort towards their intern makes the whole apprenticeship journey inestimable.

Academic courses relevant to the project: VLSI design, Embedded system design, VLSI architecture, Verilog.

PS-II Station:Texmaco Rail & Engineering Ltd., Kolkata

Faculty

Name: Prof. Arun Maity

Brief write-up on PS-II station : Texmaco focused on casting simulation of wagon components and also analysis of chemical composition of various specimen through statistical tools.

Student

Name: AKSHAY SAXENA(2019H1060511H)

Student write-up

Short summary of work done during PS-II: Design, analysis and optimization of coupler yoke casting by simulating solidification with Zcast pro to investigate flow of liquid metal and solidification defects like shrinkages and porosity. Also, quenching of railway was studied to determine temperature distribution and induced stresses during heat treatment by using ANSYS.

Tool used (Development tools - H/w, S/w): AutoDesk Fusion360, Zcast pro, Ansys thermal transient, Ansys transient structural and Matlab.

Objectives of the project: Design, analysis and optimization of coupler yoke casting with simulation of quenching operation.

Major learning outcomes: Different elements of casting industry, methoding design for casting, casting simulation and identification of defects from a casted products, reason for defects and possible solutions to rectify the defects, importance of casting simulation to reduce cost and improve casting yield.

Details of papers/patents: Work on publishing a research paper ongoing.

Brief description of working environment, expectations from the company: Since the internship is WFH, it requires self discipline, patience and self learning. The faculty and mentors did an amazing job of supporting, guidance and providing necessary tools required for the work assigned. Expectations from company to make the internship onsite as it will provide an overview on casting process practically and areas where computer simulation of casting lacks.

Academic courses relevant to the project: Computer Aided analysis and design(CAAD), Finite Element Method(FEM) and Computational Fluid Dynamics (CFD).

PS-II Station:Truecaller, Bangalore

Faculty

Name: Prof. Pravin Yashwant Pawar

Student

Name: POTTY SIDDHARTH SUBRAMANIYAM. V(2019H1030156H)

Student write-up

Short summary of work done during PS-II: Primarily worked on building unsupervised language agnostic grammar generator which will create context free grammars for languages given a short text input. Second project was building a multiclass and binary classifier for text messages for different languages.

Tool used (Development tools - H/w, S/w): Jupiter notebook, Python, Anaconda navigator.

Objectives of the project: The objective was to build a system which will be part of pipeline which will generate context free grammars which will become part of the entity detection system for parsing text and also to have classifier on top which will classify the message based on the important words.

Major learning outcomes: How to build language agnostic models that will perform unsupervised learning to provide with the tokens.

Details of papers/patents: No paper

Brief description of working environment, expectations from the company: The working environment is very relaxed with complete control over working hours. The work is super challenging and interesting, provided a great opportunity to utilise whatever we learnt academically especially with respect to machine learning, deep learning and NLP.

Academic courses relevant to the project: Information retrieval, Advanced data mining.

PS-II Station:TVS Motors, Bangalore

Faculty

Name: Prof. Srinivas kota

Student

Name: AKSHAT BIRWA(2019H1060040G)

Student write-up

Short summary of work done during PS-II: I was given the project for designing various layouts and architecture for combining 2 different power sources. I analyzed current engine with gearbox performance and then tried to match the same performance by proposing different layouts for hybrid models.

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

Objectives of the project: 1. To obtain different configuration of hybrid models combining power from 2 different sources and compare them 2. To construct layout of the selected configuration.

Major learning outcomes: Understood vehicle power flow, it helped to apply my previous knowledge of machine design courses.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: There was continuous support from the TVS motor mentors, HR and other personnel. The project was WFH. Also the project was relevant to the domain, any doubts and queries were promptly addressed and resolved.

Academic courses relevant to the project: CAD, Machine design.

Name: RAHUL VENKATESH(2019H1060529P)

Student write-up

Short summary of work done during PS-II: Electric Power steering reduces the rider's effort and provides good driver feel in cars. Similar things can also be achieved in a 2 wheeler or a 3 wheeler. The idea is to develop a ML algorithm to analyze the pattern/correlation between the various vehicle state data to enable learning, reasoning and decision making for EPS system.

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

Objectives of the project: Develop Machine Learning Algorithm for Electric Power steering system in 2/3 wheelers.

Major learning outcomes: Machine Learning and Deep Learning using Python, Digital Signal Processing.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The entire duration of PS was online (WFH), so most of the communication was through Microsoft Teams. Also, the interaction was mostly restricted to my immediate mentor only. He helped me to understand several basic concepts in Electric Power Steering System. The work timings were flexible.

Academic courses relevant to the project: NA

PS-II Station:TVS Motors, Hosur

Faculty

Name: Prof. Srinivasa kota

Student

Name: SAITEJA PAIDIMARRI(2019H1230051G)

Student write-up

Short summary of work done during PS-II: For an application of regenerative braking a prototype can be used for motor control mechanism using S32 design studio for Arm along with S32K144 microcontroller.

Tool used (Development tools - H/w, S/w): S32 Design studio, S32K144 microcontroller, 3000rpm motor with halls encoder mechanically coupled.

Objectives of the project: To work upon motor control mechanism with halls encoder, 3000rpm motor and s32k144 microcontroller.

Major learning outcomes: Ramp up process learnings such as FTM protocol, S32 design and debugging, Motor control mechanism –PWM.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is quite good, work is mostly R&D based with microcontroller, sensors and software. Company expects to learn new things for doing project and produce innovative results by own.

Academic courses relevant to the project: Embedded system design.

Name: VARUN UNMESH DHOKE(2019H1230053H)

Student write-up

Short summary of work done during PS-II: Electric Power steering has been a crucial development in automotive industry which reduces driver's efforts & make driver's handling easier. Similar development can be achieved in 2 wheeler or 3 wheeler vehicles. The idea is to develop a electronic control unit to handle the efficient functioning of various sensors & DC motor of Electronic Power steering.

Tool used (Development tools - H/w, S/w): STM 32 Cube IDE, Matlab.

Objectives of the project: Design, development and testing of multiple sensors based ECU for electric power steering of 2W/3W.

Major learning outcomes: Microcontrollers, Sensors & Actuators.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working was mainly online due to pandemic. Company mentors assigned were mainly from mechanical background, so they expected to come up with solutions from interns side. Company mainly expects the working in pro active, confident & motivated mode.

Academic courses relevant to the project: Embedded Systems Design.

PS-II Station:UBER, Hyderabad

Faculty

Name: Prof. Sandeep Kayastha

Student

Name: SHREYAS S VASTRAD(2016B5AA0749G)

Student write-up

Short summary of work done during PS-II: Writing SQL queries for querying data, dash-boarding, working on analytics tools and writing python scripts for atomization of tasks.

Tool used (Development tools - H/w, S/w): Uber internal tools for SQL and analytics, Excel, Jupyter and google data studio.

Objectives of the project: Merging different category of queries, learning analytical methods and Python scripts for automation.

Major learning outcomes: Learnt SQL, Uber organizational and business model, write basic queries on Uber query builder, and various Python packages and writing Python scripts.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Learning and understanding data analyzing tools, SQL and automating tasks using Python scripts, without no prior knowledge, has boosted my self-confidence. This increased my interest level to a very higher extent. I had a very good learning experience working under the team of Uber. There was always an atmosphere of guidance and help from the mentors. I put my sincere and whole hearted effort to contribute efficiently to the team. The company also had very good refreshment activities in between work. It organized regular musical events, sports and other recreational events to freshen up our minds. Finally, it was a very pleasant experience working with Uber.

Academic courses relevant to the project: Yes

Name: BHAVIK PUNJARI(2017A4PS1207H)

Student write-up

Short summary of work done during PS-II: One major part of the work I had undertaken at Uber involved writing SQL queries to retrieve information from the Uber databases, which was then imported into and processed within dashboards created mainly through the use of Google sheets. Oftentimes, I was also tasked with creating these Google dashboards to track a host of metrics (such as total trips taken, trips per rider, gross bookings, number of promotion trip taken, etc.) for new market regions or new payment partners. I also had the chance to assist with numerous ad-hoc analyses and one-time data pulls which basically required me to query out some data from the database, import it into Google sheets and then use sheets formulae to condense that raw data into useful/readable metrics which were then organised and presented in a final view. Another type of work that I was tasked with was doing BAU (or Business as Usual) tasks, the most common of which involved updating existing dashboards with the latest weekly and monthly data at the start of a new week or month. In most cases, when a new query needed to be written, I was usually provided with an existing query that retrieved similar data, and would just edit that query as per my own needs and requirements. As such, writing queries from absolute scratch was quite uncommon.

Tool used (Development tools - H/w, S/w): There was a wide range of tools that I used over the course of my work at Uber, however most of those tools were internal tools, exclusive to Uber such as Querybuilder, so I had to learn how to use them from the ground.

Objectives of the project: As there was no single "project" that I was assigned, most of the work I did involved assisting more senior analysts with their work, or completing tasks that I was directly assigned by managers/team leads. So, some of the "objectives" of the numerous tasks and projects I worked on included: setting up new dashboards; performing post-promotional campaign data analyses to quantify how well a promotion performed; cleaning up and updating an onboarding document that is shared with all new Uber joinees; and automating queries used by large projects to eliminate the need to manually run them, amongst other things.

Major learning outcomes: The major learning outcomes I gained were:

- Writing and optimisation of SQL queries.
- Creation, updation and maintenance of Dashboards on Google Sheets
- Usage of Google sheets formulae to process raw data into readable/useful metrics.
- Automation of queries through the use of the internal uWorc tool.
- Creation of custom database tables with the Kirby internal tool.
- Cross-team communication when working on large multi-team projects.
- Time-management/organisational skills, required to keep up the flow of continuous tasks and projects.
- Ability to quickly identify and find necessary database tables through the Databook internal tool
- Communication skills, required when presenting the results of your work to the associated stakeholders.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment at Uber is a very dynamic and fast-paced one where you will receive new work and tasks on daily basis. Despite this, your team members and other analysts are very friendly and supportive and will be happy to help you out. Due to the organisations emphasis on "ownership" of work, you will not only have to finish the work/tasks assigned to you, but will also be expected to maintain and update any and all dashboards, documents and queries you create during your time at Uber. Also, even though you will have a mentor and be part of a larger team, most

analysts work on their tasks alone, and usually only reach out to others for help/assistance. The same is true of interns and you will most likely be the only one working on a specific task/project. In terms of work deadlines, they aren't very strict, and you'll usually just have to finish your work as soon as possible, or within the stipulated time that your stakeholder mentions. You will also have a lot of freedom to meet and interact with people from other teams, as oftentimes, the most well-qualified person to resolve your doubts may not be from your own team. Furthermore, since everyone in the organisation uses either Google Hangouts or Slack, it isn't difficult to communicate with others, despite the limitations of WFH.

Academic courses relevant to the project: Unfortunately, due to my background in Mechanical Engineering, none of the academic courses I had completed were relevant to the work and projects I contributed to at Uber.

PS-II Station:Udaan, Bangalore

Faculty

Name: Prof. Annapoorna Gopal

Student

Name: HARSH VARDHAN MISHRA(2016A1PS0643P)

Student write-up

Short summary of work done during PS-II: The work done at the PS Station included stakeholder management, operations management, data analysis, process design and implementation by brainstorming with stakeholders and within team. Majorly the work involved analysing raw data and gathering insights from the same. Implementation was also done in all projects with a positive impact on the organization.

Tool used (Development tools - H/w, S/w): SQL, Programming, MS PowerPoint, MS Word, MS Excel, Google Data Studio, Google Sheets, udaan platform tools, CSV files.

Objectives of the project: The main objective of all the projects was to bring a positive change in the organization by doing analytics with a mutual benefit of my learning and meeting organizational goals.

Major learning outcomes: Learnt about Udaan platform and B2B business, how to do root cause analysis and data analysis using tools. Learnt about credit, returns, order solutions, buyer verification, logistics, order related issues and App specialization as well as about operations management and how to implement real-time process solutions. Taking up points with relevant stakeholders lead to brainstorming sessions which are of great learning experience.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Udaan is a highly dynamic company with all employees being very approachable and supportive. The employees team up well in projects with interns to provide them a great learning experience. The work is great and will be a great learning experience for anyone who interns there. The company will give you a lot of learning opportunities as one would expect from a top start-up.

Academic courses relevant to the project: Supply chain management.

Name: JOSHUA THOMAS THAMPY(2016B2A40598G)

Student write-up

Short summary of work done during PS-II: Worked on creating a framework to judge the quality of how the routing software was being used internally.

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

Objectives of the project: To create a framework to monitor inhouse routing.

Major learning outcomes: Learnt about operations in real world companies.

Details of papers/patents: None

Brief description of working environment, expectations from the company: It was a combo of WFH and office work at the beginning. Later, it was WFH only. The expectation was that a framework be developed and that will be automated.

Academic courses relevant to the project: SCM.

Name: NIMISHA JAIN(2016B4A10504P)

Student write-up

Short summary of work done during PS-II: The main objective of my project was to improve the organic buying behavior on the platform. This included improving the catalogue and marketing of products and tracking its effect on the reduction of returns raised by the buyers. I worked closely with the supply team to improve the appearance and information of the listings on the app, keeping in mind the present market trends and user expectations. At the same time, the RVP% in the metals category, from the month of December to February, was around 3% and the aim was to bring it down to 2%, resulting in saving significant logistics and admin costs involved while at the same time, making the buyers self reliant and reducing the dependency on the FoS network. I worked with the quality and returns teams here, analyzing the reasons behind these returns and figuring out solutions to all the problems the stakeholders were facing.

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

Objectives of the project: To improve organic buying behavior on the platform and bring down returns.

Major learning outcomes: Top 3 functional learnings (about the business, ways of operation etc) includes the following,

Understanding the way Udaan operates, mediating between buyers and sellers, resolving conflict, data analysis.

Top 3 behavioral learnings includes the following,

Coming out of the comfort zone and interacting with people, time and work management, taking ownership of the work assigned.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: One of the foremost things my mentor at Udaan did was introduced me to the whole team, he made me schedule individual calls with all of them so that I get to know them and their work personally. This made my incorporation into the team smoother, even in online mode. The entire team was very supportive, offering a very encouraging and open minded environment for me to present my opinions and provided me with ample opportunities to work on implementing the solutions I provided.

Academic courses relevant to the project: NA

Name: KUMAR ANKIT(2016B5A10746G)

Student write-up

Short summary of work done during PS-II: Worked on the returns problem statement at Udaan.

Tool used (Development tools - H/w, S/w): Excel, SQL, Google data studio.

Objectives of the project: To reduce the return rate.

Major learning outcomes: Knowledge about e-Commerce sector.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Working environment was very supportive to new ideas.

Academic courses relevant to the project: None

Name: AVI SHRIVASTAVA(2017A4PS0428G)

Student write-up

Short summary of work done during PS-II: 3 projects involving data analysis and prediction models development.

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

Objectives of the project: 3 Projects involving data analysis and prediction models development.

Major learning outcomes: Python, SQL, Excel.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Amazing company and culture.

Academic courses relevant to the project: Python, SQL, Excel.

Name: RAHUL BUBNA(2017A5PS1075P)

Student write-up

Short summary of work done during PS-II: Before the mid review, I worked on the dock and yard scheduling for the Last Mile vehicles in food, FMCG and fresh vertical. We were capturing the different timestamps of the process in order to get the data visibility. Some of the metrics were in-scan %, pre-loading dwell, loading time and post dwelling. After having the data visibility, we were working on the automatic dock scheduling for the same vehicles but due to lockdown restrictions, it was not possible. After mid term, I worked on the digitization of the guard register in which we are making the digital guard register and will close the offline guard register.

Tool used (Development tools - H/w, S/w): App for capturing the data, Excel, Udaan data platform.

Objectives of the project: Reduction in excess yard build up more on road time for drivers reduction in commercials.

Major learning outcomes: Supply chain management, stakeholder management, making reports and dashboards (Using data to provide actionable insights).

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I was part of the Last Mile system and design team in the Food and Fresh vertical of Udaan. I had long working hours (working 10-12 hours per day on an average) and even going to the warehouse at 2 am. My manager had lot of expectations from me and that's why I was given a heavy implementation project, a project that started from 0 so I faced lot of difficulties at the beginning but things became smooth as the time passed.

Academic courses relevant to the project: MS excel and SQL.

PS-II Station:UpGrad - Data, Mumbai

Faculty

Name: Prof. Swarna Chaudhary

Student

Name: ANSHUL CHANDRA(2017A8PS1185P)

Student write-up

Short summary of work done during PS-II: Design and development of course curriculum for the PG Machine Learning & AI by IIIT Bangalore.

Tool used (Development tools - H/w, S/w): Jupiter Notebook, NLTK, Tensorflow.

Objectives of the project: Create course content for NLP.

Major learning outcomes: Course Design, Communication.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Helpful mentors with great working environment and work life balance.

Academic courses relevant to the project: Neural Networks and Fuzzy Logic, Techniques of Social Research.

Name: GRANDHI ABHINAV(2017AAPS0270G)

Student write-up

Short summary of work done during PS-II: Worked in several teams - Content, Career Services, Student success team and did various projects like uploading content on to upGrad platform, SME Reachouts, RCA documentation, Replication, Learner calls, LR Changes, PPS, Solving issue tickets within content team. Coming to career services, we have to listen the recordings between coach and learners and make a detailed report of summary and recommendations from our end. And we will be given with agenda of the recording, have to list all the call deviations(if any) from agenda, made some creatives to send them across learners and worked on some data part. The work is same irrespective of your vertical(Data or Tech).

Tool used (Development tools - H/w, S/w): Brightcove for uploading videos.

Objectives of the project: Design and development of course curriculum.

Major learning outcomes: Course design, Communication skills.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The best part about upGrad is that they provide you freedom and flexibility to explore, learn and implement new things.

Academic courses relevant to the project: None

Name: ANJALI KIRORIWAL(2017B2TS1230P)

Student write-up

Short summary of work done during PS-II: I interned at upgrad as a content strategist in the data vertical. We were each assigned a module / chapter in one of UPGRAD's PG data programs. We were expected to develop entire module with the help of an industry expert. This involved both coding and non-coding responsibilities like PPT creation, code testing, code documentation, preparing MCQ questions, etc.

Tool used (Development tools - H/w, S/w): MS Office, Jupyter Notebook, SQL, Tableau.

Objectives of the project: To provide opportunities to advance your professional journey through rigorous online programs that offer personalised support, developed in collaboration with best in class faculty and industry professionals.

Major learning outcomes: Learnt the basics of Python programming language and some basics of data structures and algorithms by completing the software boot camp provided by the organization.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Friendly work culture. Being WFH, I still had at least one meeting daily with my team. Typical fast-paced startup culture. Interns are given as much responsibilities as full time employees. Sometimes you might have to work additional hours / on weekends to meet the strict deadlines. This is purely a content-designing role so self learning gives you a chance to develop your proficiency in the content you're working with. e.g. DS, DSA, ML/AI etc.

Academic courses relevant to the project: None

PS-II Station:UpGrad - Tech, Mumbai

Faculty

Name: Prof. Swarna Chaudhary

Student

Name: SATYAM KUNAL(2017A1PS0029P)

Student write-up

Short summary of work done during PS-II: The work was related to developing content for the modules for the cloud specialisation course. As a part of the PS-II program, my work was related to develop modules on backend services using Spring Boot. Further, the task was extended to design the modules on serverless applications. Additionally, the task also includes communicating and hunting down the subject matter experts in the fields for which the module is being developed. In each module development, the SME guide you through the development and content-related issues. Finally, you being the module owner is responsible for designing the course suited to the best industry standards.

Tool used (Development tools - H/w, S/w): IntelliJ, Spring Boot, SQL Workbench, Spring Cloud, Docker, Amazon Web Service (Lambda, DynamoDB, EC2, S3, SQS).

Objectives of the project: Designing the academic modules related to cloud specialization as per the industry standards. The project includes: Development of REST & Controller Layer using SpringBoot Develop and Deploy Serverless applications using AWS Serverless services.

Major learning outcomes: Backend development using SpringBoot, Serverless applications development and deployment using AWS Lambda.

Details of papers/patents: No

Brief description of working environment, expectations from the company: Company provided with flexible work deadlines where it is easy for the interns to grasp and understand the whole process of module development. Orientations and training sessions are arranged to familiarize you with the process. With flexibility, you are also expected to deliver the best content by taking the charge as the module owner. Overall, the work environment is great.

Academic courses relevant to the project: Project was not relevant to any academic courses as such.

Name: LAVAK SHARMA(2017A1PS0847P)

Student write-up

Short summary of work done during PS-II: During my PS as a Tech-Intern, I worked for half part of the tenure as a content strategist. As a content strategist, I work on 3 module development. One was completely made by me with the respective subject matter expert while the other 2 was made with the help of other content strategist as well. During the second part of my work, I helped create a video library which contains list of all the video of courses made so far with the path to the server where it is stored.

Tool used (Development tools - H/w, S/w): UpGrad Platform, Google Drive, Google Doc, Excel, Tableau, Kali Linux, AWS, Python.

Objectives of the project: Content creation in cybersecurity domain and video storage library creation for all videos of UpGrad.

Major learning outcomes: From the first project based on the module which I have worked upon I got to learn about Python programming, how packet inspection tools works, security related aspects from networking side, few attacks using packets and web based application security. Over all during my stay at UpGrad, I learnt how to critically analyze work, time management, team work and work distribution among my teammates itself.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: As a content strategist, the company expects to follow the timeline set to complete each task to finish the module assigned to you on time and deliver it to the students finally. However, the expectation

in the second project was not so strict and partially depends on the capability of the person working to collect and arrange all the videos in a library.

Academic courses relevant to the project: NA

Name: ANEESHA PANDA(2017A8PS0817H)

Student write-up

Short summary of work done during PS-II: UpGrad is an online higher education company. It makes courses for technical, MBA and degree programmes. My work done in UpGrad was about content development in the technical programs namely Devops and cloud. It required self learning and designing courses involving technical aspects.

Tool used (Development tools - H/w, S/w): AWS, Java, Python, UpGrad platform, brightcove, do-select.

Objectives of the project: Development.

Major learning outcomes: Devops and cloud.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The company offered flexible work hours. The managers were cordial and the senior technical teams were helpful. Over all a good experience.

Academic courses relevant to the project: Object oriented programming, Cloud computing, Operating systems, Data structures and algorithms.

PS-II Station:Versa Cloud ERP Inc, – Non-Tech, Portland

Faculty

Name: Prof. Gaurav Nagpal

Student

Name: ROHEL DHAM(2016B1A40935H)

Student write-up

Short summary of work done during PS-II: - Drip marketing project.

- Time series ML model creation, integration in web App in flask framework and deployment on Amazon EC2.

Tool used (Development tools - H/w, S/w): Python, HubSpot, Flask, Excel Sheets, IDEs.

Objectives of the project: - Improve conversion and click rates on trial mails. For inventory project, created a forecasting engine for sales and relevant widgets and reports.

Major learning outcomes: Software development, ML, Marketing campaign.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Self management expected and the management is friendly.

Academic courses relevant to the project: Nothing.

PS-II Station:Verzeo Edutech Pvt. Ltd., -Tech, Bangalore

Faculty

Name: Prof. Gaurav Nagpal

Student

Name: SANDEEP SARASWAT(2019H1490818P)

Student write-up

Short summary of work done during PS-II: To help streamlining the internal & external operations, and to develop strategies for the same.

Task allotted includes,

- KRA/KPI Module Development.
- Standard Operating Procedures (SOPs).
- Lead Generation Process improvement.
- Employee Satisfaction Index (ESI) Module.
- Employee Training and Development.
- International Market Expansion Strategies.
- New Product Development.
- Client Engagement, Retention & Feedback Strategies.
- Research on various software to increase the efficiency of the operations team.

Tool used (Development tools - H/w, S/w): Excel, Google Suit, PLS.

Objectives of the project: To help streamlining the internal & external operations, and to develop strategies for the same.

Major learning outcomes: Interning with Verzeo has been an amazing experience, we not only get to know about the EdTech space but also experienced the environment of a growing start-up. From an EdTech perspective, we understood what activities and tasks should be optimised to achieve desired efficiency. In context of the problem statements, we learnt in detail about how sales processes should flow, what are the important aspects of the same, and what should be done to achieve optimal results. We also understood how operations form the backbone of any organisation. We also had a hands-on experience with recruitment, which has better prepared us

to give our interviews, as we have been on the other side of the table now and know what the interviewer and recruiter expects. From learning and development perspective, we also understood the importance of the same first hand, as while implementation of the module, we saw the difference in results with and without an L&D module in place. To summarise, working at Verzeo EdTech has been extremely beneficial for us in terms of both academical and professional sense as we worked first hand at various departments, learnt important lessons and acquired some new skillsets which has firmly set us on the path of a successful future.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Interning with Verzeo has been an amazing experience, we not only get to know about the EdTech space but also experienced the environment of a growing start-up. The environment was a bit chaotic which can be expected out of an Edtech startup.

Academic courses relevant to the project: Project & Operations Management, Product Management.

Name: AKSHAYA. M(2019H1490843P)

Student write-up

Short summary of work done during PS-II: Branding and marketing of the product initiatives in verzeo.

Tool used (Development tools - H/w, S/w): Excel, Ahrefs, Canva, Social media marketing analysis.

Objectives of the project: To improve the brand image of the products, increase awareness of the products.

Major learning outcomes: Tools used in marketing, devising marketing strategies.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The company is situated at Bangalore. The company location was well equipped and the work was challenging. There were hard negotiations with upper management as my team was directly under them which lead to better learning. Since, it is a startup there were many aspects and different areas to look at, which gave exposure to real-time handling of business.

Academic courses relevant to the project: Moderately relevant

Name: AMANDEEP SINGH(2019H1490845P)

Student write-up

Short summary of work done during PS-II: My works at PS-II can be summed up as below

- 1) Hiring and recruitment: Hired over 400 people in 5 months.
- 2) HRMS automation: Introduced door access tools within the first month of PS for 8 floors across 3 offices. When things turned to WFH, I brought in the GreytHR tool and automated all the HR process for the organization.
- 3) Attrition research and ways to improve it: Suggested various measures to the C-suite in organization to bring down the attrition rates.
- 4) Streamlining HR policies and practices: I created and devised various policies that never existed for this organization.

Tool used (Development tools - H/w, S/w): GreytHR, SecurePass, Google Sheets, Excel, Monster, etc.

Objectives of the project: HRM practices were never the focus of research or concern when it comes to start-up setting, not until recent years, where firms started to understand the value created by it. The project involves picturising HRM practices as the imposing components which create, strengthen and support every strategy made by the organization. The goal of this project

is to understand the role of HRM in the startup environment, strategic or non-strategic otherwise, in the support of organizational performance and growth. Another goal of this project is to understand whether the HRM practices implemented varies according to the companies and industry including the age of the company. This gives the best shot at understanding the founder's perspective in implementing such practices and employee's perspective to align with company's vision and mission.

Major learning outcomes: Following were the learnings from the Project, I found out:

1. What is the objective of Human Resource Management in a startup environment?
- 2.What are different human resource practices implemented in startup space?
- 3.What aspects of the human resource practices differ across different startups?
- 4.Are the HRM practices implemented in the organization differ in terms of perception by both the top management and the employees.

Automation of an organization was one of my key projects where I automated the HRMS for Verzeo, that has over 1000 employees.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment in Verzeo is very healthy. The employees and people at senior position are very supportive. The organization has a flat, open door structure which allows freedom of expression. The organization takes good care of its employees.

Academic courses relevant to the project: Definitely Yes, most of the academic courses were very helpful.

PS-II Station:Vestas Technology Ltd., Chennai

Faculty

Name: Prof. Raghuraman. S

Student

Name: ALOKKAN KRISHNA PRIYA(2019H1430100H)

Student write-up

Short summary of work done during PS-II: Currently working under specialist support in loads department. The work which we do deal with Vestas Turbine Simulator (VTS) wherein we calculate the loads in this software, and find out whether the turbines are suitable for that particular site conditions. We do multiple iterations in order to reduce the load ratio less than 3% of VTS uncertainty. JIRA task created for load mitigation, Vestas site check outfile is checked and arriving at the reasons for load exceedance, input validation like the tower, the blade etc., to be used for the simulation, then we generate the worst loaded turbine climate, then climate comparison has been done with the design conditions to check whether the simulations are needed or not, after that we select particular load cases to be simulated, then we select particular VTS model and simulation details, then VTS calculation has been done which is compared with design conditions and observed the exceeding loads, checking the reasons for load exceedances, then we mitigate the loads if any, if mitigation is not possible from our end, we tell the siting engineers to apply the wind sector management for a particular wind sector, or we give any further suggestions, if further mitigation is not possible then we can give signoff to the respective platform team or Technical Contract Report (TCR) suggestion and finally we conclude the task with the observations.

Tool used (Development tools - H/w, S/w): JIRA software, Vestas Turbine Simulator, Wplot, Loadview, Sp2, Matlab.

Objectives of the project: 1. To check the suitability of loads acting on the turbine for that particular site conditions 2. To check whether all the loads are within the acceptable limits, if not we mitigate it.

Major learning outcomes: Suitability of the wind turbine with respect to different site conditions all over the world has been studied and implemented.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment of the company is overall great wherein I got many opportunities as well as motivation to learn new things and methods. The people in this company are very friendly and helpful especially the manager who supports and guides us throughout. My team which is a specialist support was good and supportive in terms of work as well as in life. The company totally encouraged me in pursuing my future ambition. It was really worth joining Vestas.

Academic courses relevant to the project: NA

PS-II Station:VMware Software India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Chandra Shekar R.K

Student

Name: KHUSHBOO KUMARI(2017A7PS0012P)

Student write-up

Short summary of work done during PS-II: I worked in Telco and Edge cloud business unit. My project was to develop telco cloud scale simulator. In 1st month of internship, we were assigned resources to gain hands on experience with VMware product as it was required for my project too. Also, I learnt Kubernetes, Java and JavaScript for the project. I used man in middle tool for modifying request and responses from one server to another backend server. With this I achieved the simulation goal.

Tool used (Development tools - H/w, S/w): Distributed frameworks, scale simulation, Java, Javascript, Kubernetes, Man in middle tool.

Objectives of the project: Test the scale of Telco Cloud.

Major learning outcomes: I came to know that how corporate world works that is we need to keep exploring things, taking help from each other and helping others to move ahead.

Details of papers/patents: Not Applicable

Brief description of working environment, expectations from the company: Work culture was good. Manager and mentors are very understanding. There was enough time for everything like skills, learning and then working on project.

Academic courses relevant to the project: Computer Network

Name: PRAKHAR GUPTA(2019H1030157H)

Student write-up

Short summary of work done during PS-II: The work required first to learn and go through Virtualization, NSX, had planned sessions on some of the tools and technologies. Given a task to do enhancement in cli part which is setting default balancing metric separate for both interrupt and polling mode when ENS is enabled on a distributed virtual switch. The next task required me to go through reading and understanding large amount of code in C, UENS TLB performance, for this task I have to set up test environment which will use DPDK pktgen and l2fwd applications, understand and visualize the performance of TLB and mainly compare different metric which are used for balancing.

Tool used (Development tools - H/w, S/w): C, Python, Git, Gitlab, Perforce, Gerrit, ESXi (Nested and Bare Metal), NSX, VS code, Putty, Bash scripting.

Objectives of the project: The aim of the project is to do some cli enhancements and create a setup to do tests for UENS TLB performance (Unified Enhanced Network Stack - Thread Load Balancer) to bring outcomes as this will be used as default network stack in next releases.

Major learning outcomes: The workflow of building, deploying and testing the builds, network virtualization, own and manage the tasks.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The people and work culture was great, from smooth on-boarding to the talks from company heads, to events where we participated, played and had fun. We had weekly meetings with the manager and my mentor. Both were great, from the manager giving guidance, constructive suggestions, to mentor helping us in day to day activities. Even though it was work from home, the overall experience was awesome.

Academic courses relevant to the project: Computer Networks, Operating Systems.

Name: PRASHANT KUMAR(2019H1120064P)

Student write-up

Short summary of work done during PS-II: In the project, the performance benchmarks of Cassandra NoSQL database on vSAN RAID 0 and RAID 1 cluster and also on vSAN direct storage cluster have been done. Benchmarks have been done using YCSB tool. Yahoo! Cloud Serving Benchmark (YCSB) is an open-source specification and program suite for evaluating retrieval and maintenance capabilities of computer programs. It is often used to compare relative performance of NoSQL database management systems. I created a Python script which

automate the vSAN data store stats collection which also handled the execution of YCSB workloads and cleanup of each ESXi host on which VMs are running.

Tool used (Development tools - H/w, S/w): YCSB, Python, Java, Linux Shell, vSphere, vCenter, vSAN.

Objectives of the project: To benchmark the performance of popular NOSQL database i.e. Cassandra on vSAN architecture when servers are running on virtual machines and provide a comprehensive report after analysis of the performance benchmarks recorded.

Major learning outcomes: - Cassandra deployment on large scale especially on virtual environment.

- Automation of system performance Stats collection through Python.
- Explored how industrial level benchmarking of system is done.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Company expects eagerness and self motivation to learn something new. Company provides the best infrastructure possible along with best possible hardware required for the project. Mentor and manager are very cooperative and knowledgeable. Just be proactive about your work and approach your mentor/manager in case of any questions/doubts.

Academic courses relevant to the project: Cloud Computing, Distributed Computing, Data Mining, Software Engineering and Management, Database Management System, Data warehousing.

PS-II Station:VMware Software India Pvt. Ltd., Pune

Faculty

Name: Prof. Sonika Chandrakant Rathi

Student

Name: PRAKHAR SRIVASTAVA(2016B5A70438G)

Student write-up

Short summary of work done during PS-II: As more and more of the industry moves its operations to cloud platforms, the risk of security vulnerabilities being exploited grows. With a new initiative, VMware aims to provide in-built intelligent threat detection for Windows VMs that does not require the users' attention and works independently of the VM's configuration. My work primarily involved creating a proof of concept for this initiative.

Tool used (Development tools - H/w, S/w): Docker, Kubernetes, Spring Boot, Bazel for C++, Influx InfluxDB, Influx Telegraf, Apache Druid, Prometheus, Apache Kafka, VMware Cloud, Director, VMware vCenter, VMware ESXi, VMware NSX-T.

Objectives of the project: Develop a proof of concept for a low-level built-in threat detection system for Microsoft Windows VMs running on the VMware hypervisor based platform.

Major learning outcomes: Containerization technologies - Docker, Kubernetes
Machine Learning for malware detection, Computer networks and network security.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Very welcoming, adaptive workload. The colleagues here are very cooperative, smart and hard working. The company goes beyond the expectations to ensure the employees' wellbeing. Employees are expected to put in reasonable efforts into their work and actively ask for help if needed.

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

Name: PAARTH DASSANI(2017A7PS0965G)

Student write-up

Short summary of work done during PS-II: Made an algorithm that parses input helm charts(scans requirements for your code to run) and suggests an optimal specification for your cluster. Used two different approaches for the algorithm, and developed a frontend as well after integrating with their product.

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

Objectives of the project: Kubernetes cluster size planner.

Major learning outcomes: Kubernetes, Web development.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work culture was great, people in my team were very helpful and friendly. Good work load balance.

Academic courses relevant to the project: OOP, DSA.

PS-II Station:Walmart Global Technology Services, Bangalore

Faculty

Name: Prof. Vimal S. P

Student

Name: AMAN KUMAR SINGH(2016B2A70520G)

Student write-up

Short summary of work done during PS-II: Did a proof of concept on camunda workflow engine for CCPA implementation. Explored different features of camunda and performed load tests to prove its efficiency in handling requests.

Tool used (Development tools - H/w, S/w): Camunda, JMeter, Kubernetes etc.

Objectives of the project: To provide a proof of concept on camunda workflow engine.

Major learning outcomes: Learnt about workflow engines in detail and how government regulations are implemented in industry. Got exposure to agile process, scrum and other processes followed in a massive company like Walmart.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The internship was completely virtual and there is no time bound on how long we have to work each day. Some days may be more hectic than others but overall it's a chill environment.

Academic courses relevant to the project: OOP, DSA.

Name: GANDHI ATITH NIKESHKUMAR(2017A7PS0062P)

Student write-up

Short summary of work done during PS-II: I worked on designing and developing a web application that will act as a dashboard for the leadership. I integrated data from different software services that helps in calculating various metrics for the dashboard. Since we were developing a new product, I also worked on designing the application's database schema. I created various web-based REST APIs. Developed an interactive React-based front-end for the application that shows various graphs, tables, metrics, charts, etc. for the users to get an analytical overview of the working of various teams under them.

Tool used (Development tools - H/w, S/w): HTML, CSS, JS, Node.js, React, Azure SQL, Postman, VSCode.

Objectives of the project: The objective of the project was to create a web application that will act as a dashboard for the leadership to track various metrics related to development.

Major learning outcomes: I learnt a lot about how to create an efficient and interactive web application by using various state-of-the-art technologies and libraries. I also worked with various new tools, products, and libraries like Postman, Azure SQL, Material-UI, Chart.js, etc. In order to understand the requirements of the leadership for the dashboard, I conducted meetings with many senior leaders, which has helped me to improve my communication skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Walmart is a good company. The working environment is very open and the co-workers are always ready to help. The work timings are flexible and overall the work environment is very liberal. Walmart is a pleasant place to work and learn.

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

Name: YASH CHATURVEDI(2017A7PS0078G)

Student write-up

Short summary of work done during PS-II: Created two new metrics for assessing Walmart supply chain optimisation, with code to calculate efficiency and upload results to the front end for analysis created a script to allow users to change the state of a list of items from the Walmart product catalogue as per their requirement, and effect the required changes in the backend designed a front-end user utility to allow users to change the state of items as required.

Tool used (Development tools - H/w, S/w): Java, Spark, Elastic search, Python, JavaScript, ReactJS.

Objectives of the project: To develop new UI and design metrics to improve access to and management of the Walmart supply chain.

Major learning outcomes: Internal tools and development conventions, data warehousing and retrieval, web development and backend development.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment was cordial but also coordinated, with the team working to meet targets within stipulated deadlines. Help was always on hand, with engineers with varied skillsets present on the team, and reasonable accommodations for learning curves and personal leaves was given. A vast learning catalogue and access to training and resources was also available. Team was ambitious and was scaling up rapidly, in strength as well as in the different projects taken up.

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

Name: RITVIK AGARWAL(2017A7PS0136G)

Student write-up

Short summary of work done during PS-II: I was working on microfrontend architecture. Worked on a proof of concept for this architecture and how it can be implemented for CCPA team. Used module federation to achieve a microfrontend architecture. Worked on session management and authorization.

Tool used (Development tools - H/w, S/w): React, Nextjs, Webpack, WCNP, Docker.

Objectives of the project: Understanding and implementing Microfrontend architecture for a portal.

Major learning outcomes: Learnt about agile process, scrum meetings, Reactjs and front end development. Learnt about docker, deployment to WCNP, authentication, authorization and how to implement it using active directories.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Internship was virtual, I was clearly stated about the expectations that the team has from me. I was able to ask questions easily and team was willing to answer them.

Academic courses relevant to the project: OOP, DSA.

PS-II Station:Wavelabs Technologies, Hyderabad

Faculty

Name: Prof. Mohammad Saleem J Bagewadi

Student

Name: LAAWANYA KISHOR(2017A8PS0580G)

Student write-up

Short summary of work done during PS-II: My project was based on software-defined network technology used to manage the mobile core network of 5G architecture. The project has two parts:

1. A detailed UPF SMF interaction client server model written in Python.
2. An integrated system written in Python demonstrating the Magma core architecture.

Tool used (Development tools - H/w, S/w): Ubuntu 20.04 LTS, Python, gRPC, Ryu controller, Mininet, OpenFlow, SDN.

Objectives of the project: To replicate the SMF UPF interaction of Magma 5G network core.

Major learning outcomes: In depth understanding of 5G network architecture, SMF, UPF, ryu controller, mininet topology, SDN and OpenFlow protocols.

Details of papers/patents: Machine Learning for 5G,B5G mobile and wireless communication potential, limitation, and future directions.

Brief description of working environment, expectations from the company: Wavelabs Technologies has a great work culture, my mentor and peers were very supportive. Working here gave me great exposure to some on going research work in the field of 5G technology.

Academic courses relevant to the project: Digital Communication.

Name: SOUJANYA PATIL(2019H1490865P)

Student write-up

Short summary of work done during PS-II: Included market research of identified clients and generated new leads. Involved making of proposals, SOWs, pitching email etc, on the road to develop business further.

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

Objectives of the project: To develop a marketing campaign in order to expand existing accounts and discover newer ones with significant market research in place. To understand the nuances of business development and market research associated with SaaS (Software as a service) companies.

Major learning outcomes: Understood how marketing is different for SaaS companies and how to develop accounts.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The manager and CEO were both extremely warm and approachable. Both the business development team and the marketing team were highly encouraging, provided help and support. The working hours were flexible and productivity depends on the work done and not the no. of hours spent online. Even during a health crisis (Tested positive for Covid) the company extended immense support, creating a overall healthy and welcoming work environment.

Academic courses relevant to the project: Marketing, Market research.

PS-II Station:Western Digital (SANDISK), Bangalore

Faculty

Name: Prof. Preeti N. G

Student

Name: ANIMESH MISRA(2019H1230048G)

Student write-up

Short summary of work done during PS-II: Objective - For the verification of our internal RISC-V cores at Western Digital, we have incorporated a compliance suite to verify the adherence of our CPUs to the RISC-V architecture. RISC-V compliance suite is the RISC-V architectural testing framework that is used to test if a particular RISC-V CPU implementation device has understood and implemented the specifications correctly.

Definition - Compliance suite contains a set of tests which when compiled, simulated, and verified on the RISC-V device, helps to ensure that software written for a given RISC-V profile/specification will run on all implementations that comply with that profile.

Plan - We've planned to run these tests on a golden ISA standard like RISC-V 'Spike' simulator then our internal golden ISA standard called 'Whisper' and finally on our RTL designs in co-sim mode.

Results - The compliance suite incorporated is working for Spike, Whisper, and for RTL+Whisper in co-sim mode. Whisper and Spike have been tested for both 32-bit and 64-bit, while RTL co-sim has been tested with 32-bit only. Regressions were all clean and passing.

Tool used (Development tools - H/w, S/w): GCC compiler, RISC-V Instruction set simulators - 'Spike' and 'Whisper', 'Exceed etx' for web based UNIX desktops.

Objectives of the project: For the verification of our internal RISC-V cores at Western Digital, we have incorporated a compliance suite to verify the adherence of our CPUs to the RISC-V architecture. RISC-V compliance suite is the RISC-V architectural testing framework that is used to test if a particular RISC-V CPU implementation device has understood and implemented the specifications correctly.

Major learning outcomes: Learnt basic UNIX commands, Git commands, Gvim commands, understood makefiles and ways to edit them.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: My workplace promotes employee safety, growth, and goal attainment. It encourages to perform to our highest ability. The company focuses on its overall culture, supporting employee growth, and making employees feel safe and comfortable. The seniors are knowledgeable, caring, hard-working, and helpful. Their advice, shared experiences, and the planned way of moving towards their next target motivates me to inculcate those habits. At last, I expect to have a fulfilling engineering career here.

Academic courses relevant to the project: VLSI Architecture, Reconfigurable Computing, VLSI Design.

Name: NARENDRA SHRIKANT TIWARI(2019H1230527G)

Student write-up

Short summary of work done during PS-II: This Project aims to develop a GUI which would help to decrease the potential errors that arises due to manual process of validating a test package which not only consumes lot of time but also more prone to human errors.

Tool used (Development tools - H/w, S/w): Jira, Confluence, Sublime Text.

Objectives of the project: Automation project aiming at zero defects in cSSD test process.

Major learning outcomes: I learnt many new things in this project, but the major ones are: Python scripting, Tkinter module to create a GUI, test program release for mass production.

Details of papers/patents: Not published

Brief description of working environment, expectations from the company: Working environment was very helpful and energetic. All my team members helped lot in understanding about different topics and how we can incorporate them in a project. The experience was

beyond my expectations as I was very afraid because this was my first experience in the corporate world but all the colleagues here made me feel very comfortable.

Academic courses relevant to the project: VLSI Design, VLSI Architecture.

Name: SIS ROSE MARY GIGI BINDU(2019H1240136H)

Student write-up

Short summary of work done during PS-II: The project assigned to me was aimed at establishing a correlation of data valid window between the wafer level test and drive level test for a SSD product line. From the obtained outlier distribution, we were able to prove that we need not perform both tests and we can afford to skip one of the tests in the test flow without compromising on the quality of the product. This result helps us in saving test time and test cost in all the future builds of the product. Day to day activities were focused on the memory test related to SSD product line.

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

Objectives of the project: To establish a correlation study for a SSD product line.

Major learning outcomes: Test flow for SSD product was fully understood.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The working environment at the PS station was very good. Everyone including senior management were approachable and helpful. My mentor and manager were always available for me if I had any doubts or if I was stuck anywhere. All the teammates were quite supportive and encouraging.

Academic courses relevant to the project: VLSI Architecture.

Name: DESHPANDE GAURI SHEKHAR(2019H1400074G)

Student write-up

Short summary of work done during PS-II: Had to contribute in firmware writing for front end (USB) of external SSD controller.

Tool used (Development tools - H/w, S/w): Visual studio, other company specific tools.

Objectives of the project: Development and integration of USB front end firmware for external SSD storage controller.

Major learning outcomes: Learnt about NAND Flash, USB protocol in detail. Currently working on the firmware development for command processing and data processing CPU in host interface module for USB front end for external SSD storage controller.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Work environment is good, colleagues are helpful and cooperative. Can get doubts clear by them anytime. Company expects us to learn on own and they help if stuck. Have to do the work in stipulated time as far as possible.

Academic courses relevant to the project: Embedded systems, RTOS , Device drivers.

PS-II Station:Whirlpool, Pune

Faculty

Name: Prof. Samata Mujumdar

Student

Name: ALTEKAR NIKHIL RAJU(2019H1060028P)

Student write-up

Short summary of work done during PS-II: I was part of project in which we need to build the simulation capability. The aim of project was to develop a correlation between actual and simulated value of GAP in induction cooktop. If correlation is less than 90% then we need to change inputs of simulations to get close values of gap as that of actual reading. And at last, we found the parameters which significantly affects the GAP by variation study.

Tool used (Development tools - H/w, S/w): Excel sheet, G-Suit, CREO.

Objectives of the project: To develop correlation between designed and actual Coil-to-Glass GAP value in an induction Cooktop.

Major learning outcomes: The major learning from Internship was Communication & Team Bonding. People connection was major conception. It was transition from campus to corporate life. I learnt how to use technical knowledge in a real-life product. Innovation, time bound execution and diversity are the other major learnings.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work culture is good. This organization does not have hierarchy. The manager & colleagues are friendly. Weekly meetings and brainstorming sessions boost the new ideas & give alternative approach to the problem. Mentor helps through out the Internship period. The ongoing projects are also good, which give opportunity to file patent or bring up new product. Overall experience was good and the transition from campus to corporate was also smooth.

Academic courses relevant to the project: Quality Control Assurance and Reliability, Finite Element Methods, Product Design.

Name: Shakti Mohanty(2019H1410127P)

Student write-up

Short summary of work done during PS-II: A simulation methodology for mapping the hot foiling process was developed. One of the failure modes (bending of foiled part) was studied and a simulation to predict this effect was developed. The simulations were multi-step (hot foiling and then cooling) coupled thermo-mechanical simulations. The simulation results contour plot showed the hot foiling process and subsequent cooling. Due to a difference of coefficient of thermal expansion of the foil and ABS plastic, the foiled part bends upon cooling, creating a shape of banana. This was known as banana effect. The simulation showed the expected trend of the effect and further the results were validated with experimental data. A correlation of up to 94% was found. The project is useful to Whirlpool in predicting the bending of foiled part and thus, prevent rework of the part and save associated costs.

Tool used (Development tools - H/w, S/w): Hypermesh (Pre-processor), LS-DYNA (Solver), Hyperview (Post-processor).

Objectives of the project: Develop a standard simulation methodology for hot foiling process and perform simulation of process. Perform a cooling simulation after hot foiling to predict bending of foiled part. Correlate simulation and experimental data.

Major learning outcomes: Hot foiling process - failure modes, operating conditions and materials used.; Thermo-mechanical coupling of solvers for multi-physics problems.; Explicit and Implicit time integration schemes and their recommended applications.; Hypermesh and LS-DYNA.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The organizational work culture is informal, inter-functional and thus, offers opportunity for growth.; flexible work timings.

Academic courses relevant to the project: Finite Element Methods.

Name: TIDKE MALHAR DEVIDAS(2019H1410132P)

Student write-up

Short summary of work done during PS-II: I worked on developing alternative designs for handles. It started with developing many design concepts for handles with their own advantages and drawbacks. These concepts were made in CAD software. The next step was to evaluate these concepts based on various factors like manufacturability, strength, UI, cost, aesthetics. Simulations were performed to give ratings for manufacturability and strength. Next step was to manufacture prototypes and test them.

Tool used (Development tools - H/w, S/w): PTC Creo Parametric.

Objectives of the project: To develop low cost alternative designs for dishwasher handles.

Major learning outcomes: 1. Learnt about plastic design and manufacturing2. Learnt modelling in PTC Creo Parametric3. Learnt about idea generation and product development process4. Experienced critical thinking for design ideas, decision making in design.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: My internship was WFH for the whole duration. I was working with people who had many years of design experience under their belt, so I had plenty of guidance and help whenever required. Colleagues were very casual, approachable and super helpful. Timings were flexible as long as the work assigned is completed. Idea generation and innovation is the key focus of any design related

work. Ample opportunities were provided to showcase my work and to provide inputs to others in their respective projects. My technical opinions were heard, criticized and valued by the team. The work done will never go unappreciated.

Academic courses relevant to the project: 1. Product Design 2. Production Techniques I (Plastic Manufacturing ; GD&T) 3. Mechanics of Materials.

Name: PRAKHAR MOHAN KAUSHIK(2019H1420142P)

Student write-up

Short summary of work done during PS-II: I am working on developing an end-to-end tool for cost optimization which will be used by global sourcing team. This tool is integrated within google sheets by using different simulation models in the background. It focuses on a data based approach to arrive at an optimized cost.

Tool used (Development tools - H/w, S/w): Minitab, Google sheets, Simulations, Algorithmic optimization etc.

Objectives of the project: Cost optimization in global procurement.

Major learning outcomes: I learnt how to develop a data based tool which will help the global sourcing team for better negotiations. I learnt how to use different tools and also had continuous feedback from the stakeholder so that the product can be refined as per the needs of end user.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Whirlpool corporation is a great organization to work for. Everyone helped me out within my team and even across the team. Everyone is eager to help you out with your problems and the higher management is easily accessible. I loved this organization as it matches the complete description of what I want from my corporate expectations.

Academic courses relevant to the project: World class manufacturing, manufacturing planning and control and my research practice and study in advance topic helped me a lot.

PS-II Station: Women Development & Child Welfare Department, Hyderabad

Faculty

Name: Prof. Sandeep Kayastha

Student

Name: NARKEDAMILLI VENKATA SAGAR(2017A4PS1166P)

Student write-up

Short summary of work done during PS-II: The work has mainly comprised of social policy analysis. I have studied, analyzed and documented child centric schemes of the Women Development & Child Welfare Department of Telangana. I also worked on legal affairs which include show-cause notices and high court affidavits.

Tool used (Development tools - H/w, S/w): G-Suite & MS Office.

Objectives of the project: Social Policy Analysis.

Major learning outcomes: Government Policies, Schemes, Functions.

Details of papers/patents: No Patents or Papers

Brief description of working environment, expectations from the company: The Department expects candidate to be self driven with an analytical mindset. Government functions and procedures are intensive and quite tricky. Environment includes working with

gazetted officers, on ground workforce and consultants. Most of the work takes place offline with little flexibility to work online.

Academic courses relevant to the project: Public Policy, Project Management & Principles of Management.

PS-II Station:Xilinx India Technology Services Pvt. Ltd., Hyderabad

Faculty

Name: Prof. Krishnendu Mondal

Student

Name: AYUSH TIWARI(2016B4AA0454G)

Student write-up

Short summary of work done during PS-II: Worked on heterogenous interconnects to enhance the performance of next-generation architecture.

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

Objectives of the project: To understand the present routing architecture, metal plan and do experiments to come up with a proposal for the next-generation architecture.

Major learning outcomes: Importance of interconnects and how they are planned.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: People in my team were really supportive and encouraging. They task me with things to experiment with and help me along the way. My input is also given importance and always explored in depth.

Everyone is highly qualified and rightly suited for their jobs. I am always asked to question things and experiment and included in all team meets. Xilinx has very employee friendly work culture.

Academic courses relevant to the project: ADVD, MuE, Analog devices, Network analysis, Layout design.

Name: PARAS VAISH(2016B5A30860H)

Student write-up

Short summary of work done during PS-II: The work involved testing and validation of hardware accelerators and development of binary search IP.

Tool used (Development tools - H/w, S/w): Vivado, Vitis, Zynq Ultrascale +

Objectives of the project: Testing and validation of hardware accelerators, development of binary search IP.

Major learning outcomes: Testing and validation, IP development.

Details of papers/patents: None

Brief description of working environment, expectations from the company: It was WFH setup due to pandemic. It is better to have knowledge of verilog or system verilog, programming languages like C, Python. Good to have exposure to Xilinx FPGAs, its tools Vivado and Vitis.

Academic courses relevant to the project: Digital design, FPGA lab.

Name: SRIJAN NIKHAR(2016B5AA0474G)

Student write-up

Short summary of work done during PS-II: 1. Built updated CCIX based designs and ran them on the hardware for verification after debug.
2. Created an automation script for hardware /validation of CCIX designs (Python based).
3. Created and verified RTL designs for hardware checksum offload for ethernet module in versal cards.

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

Objectives of the project: Develop CCIX based platforms for hardware acceleration.

Major learning outcomes: CCIX, PCIe, CXL architectures, Python automation, RTL designs.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Mentors pay attention towards ensuring good learning outcome through the project. A good mix of work and leisure has been ensured through weekly chat sessions.

Academic courses relevant to the project: Computer Architecture, FPGA Design, Digital Design, Digital VLSI Design.

Name: NEILALOHITH SHARMA(2017A3PS0202G)

Student write-up

Short summary of work done during PS-II: The aim of the project is to design a reset logic and test bench for an internal reset mechanism in the AXIS ILA which currently runs an excess 55 clock cycles. Then, the reset mechanism is parameterized and tested for a range of values.

Then, cross clock domain techniques are used in the module to make it work in multiple clock domains and avoid metastability issues. This work is done for designing modules that are needed for soft IP blocks targeting FPGAs.

Tool used (Development tools - H/w, S/w): Vivado IDE, Verilog and SystemVerilog.

Objectives of the project: The aim of the project is to design a reset logic and test bench for an internal reset mechanism in the AXIS ILA which currently runs an excess 55 clock cycles. Then, the reset mechanism is parameterized and tested for a range of values. Then, cross clock domain techniques are used in the module to make it work in multiple clock domains and avoid metastability issues.

Major learning outcomes: Writing modules in Verilog, integrating them, writing testbenches and running various testcases.

Details of papers/patents: None

Brief description of working environment, expectations from the company: It is very pleasant working environment where employees take time out to help interns with any problems faced. There are also one on one meetings every week where any issues are readily resolved.

Academic courses relevant to the project: Digital design, VLSI design, Microprocessors and interfacing.

Name: P. ARUN KUMAR REDDY(2017A3PS0286P)

Student write-up

Short summary of work done during PS-II: During the PSII period, I learnt about using data structures in Python, Parsing files using Regex, and working with XML files using Python modules. I also learnt the programming language TCL and its integration with Xilinx's Vivado

software. Above all, I was introduced to the corporate world and gained significant exposure during my time.

Tool used (Development tools - H/w, S/w): Python, C++, Vivado, Linux.

Objectives of the project: The goal of the project is to create timing checks that run as regressions to check speedfile quality. Speed files contain speed models for various elements of a device: nodes, pips, bels and also for setup and hold, propagation delays, jitter, etc.

Major learning outcomes: During the PS II period, I learnt about using data structures in Python, Parsing files using Regex, and working with XML files using Python modules xml.etree and lxml. I also learnt the programming language TCL and its integration with Xilinx's Vivado software. Above all, I was introduced to the corporate world and gained significant exposure during my time.

Details of papers/patents: None

Brief description of working environment, expectations from the company: My manager and team members were readily available whenever I had encountered a problem despite being WFH. I also had the opportunity to interact with Xilinx employees from other countries.

Academic courses relevant to the project: Introduction to C programming, Data Structures and Algorithms.

Name: KANISHK SINGH RAGHAV(2017A3PS0366P)

Student write-up

Short summary of work done during PS-II: Team: Vitis Vision

Task: Benchmarking computer vision functions on CPU and comparing the results to their FPGA implementations.

Tool used (Development tools - H/w, S/w): C++ with OpenCV, Python, Linux Shell, Vivado.

Objectives of the project: Vision benchmarking.

Major learning outcomes: Image Processing and Computer Vision, Python Scripting.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Due to COVID-19, the entire term was WFH.

Academic courses relevant to the project: Digital Image Processing, Pattern Recognition, C Programming.

Name: AVNISH TIWARI(2017A3PS0443H)

Student write-up

Short summary of work done during PS-II: Xilinx has a image processing library for FPGA, Vitis Vision. It has all the basic functions from opencv and some more complex functions that are being used more and more in today's developing technology. The library is written specifically to decrease the computation time for a daily use opencv function. I was involved in the benchmarking of some functions in the library against Opencv and some other real life databases. It's done to quantify the difference between opencv running on a CPU and the vision function on FPGA. I also wrote reference code for some of the vision functions to compare them with and characterize the error in the output.

Tool used (Development tools - H/w, S/w): LINUX, Python, C++, She'll script.

Objectives of the project: Write the reference code for some functions using opencv for error analysis. And calculate CPU latency of every reference code for comparison with it's corresponding vision function.

Major learning outcomes: LINUX, Image processing, c++

Details of papers/patents: Opencv documentation.

Brief description of working environment, expectations from the company: It's a good company to work in. We had weekly meeting with the manager for the update on the work and discussed all the aspects of our process. Everytime it was a 2 way discussion. They also helped with the project, whenever we get stuck we could just call them and discuss. There was a deadline for the whole project to be sure, but no specific timeline for all the steps. Initially, the work took longer time to finish then when we got the hang of it, it was quicker. Company was patient the whole time.

Academic courses relevant to the project: Introduction to C, Digital Image Processing, FPGA Lab.

Name: REETANK RASTOGI(2017A3PS0542H)

Student write-up

Short summary of work done during PS-II: The first project was about improving the Vitis runtime. Its first part was related to incremental compilation feature, where I had to generate some test cases. These test cases were generated by first running the original design, then making some meaningful changes in the design and checking if changes are small (less than 5%). If yes, then run this modified design again using incremental compile feature in Vivado. Then I made a document where parameters like hardware build time, % cell reuse etc. are compared for all 3 designs.

The second part of the project was about improving the runtime by modifying the place_design command. So my task was to generate some test cases, where, in the original design there will be only one instance of a large kernel (eg. Deep Learning Processor Unit) and in the modified design, there will be 3 or more instantiations of the same kernel. Then, I generated the report, where I compared the number of cells and nets in the kernel in original design with cells and nets in all instances in modified design.

Tool used (Development tools - H/w, S/w): Vitis, Vivado, C++, CSH scripting, Perl scripting, Javascript, HTML.

Objectives of the project: To improve the Vitis runtime.

Major learning outcomes: Vitis, Vivado, C++, CSH scripting, Perl scripting, Javascript, presentation skills, problem solving approach.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment of the company is very good. All the managers and department staff are very friendly and are always ready to help you or clear your queries (not only regarding the project, but your career queries too).

Academic courses relevant to the project: FPGA lab (to get familiar with Vivado).

Name: PRABHMEET SINGH CHILANA(2017AAPS0378H)

Student write-up

Short summary of work done during PS-II: I worked on speedfiles/timing files, which are special files that are loaded by Vivado, an IDE developed by Xilinx. Special tools compile the hardware device delays into these speedfiles/timing files. These files are critical, and any error

in these files can cause problems to the end-user. To catch these errors at an early stage, the following checks were implemented:

Coverage check: To ensure timing data/arcs are present for all modelled cells.

Completeness check: To ensure timing data/arcs are complete for all modelled cells.

Correctness check: To check the validity of timing data. This check is dependent on the type of file being checked.

Synchronicity check: To check synchronicity of timing data across all families/ devices for a given architecture.

These checks were then run as regressions, a process of running a series of tests every day to verify the correctness of the software in response to data updates and tool changes. For this, rdi, an internal framework developed by Xilinx, was used. The tests were submitted to a load sharing facility (LSF), where all these tests were run parallelly to save time and other resources.

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

Objectives of the project: Create software checks that can be run as regressions to check the speedfiles(internally generated files) based on specific criteria.

Major learning outcomes: I got an opportunity to interface with the Linux environment. I also learnt to use data structures, regex and other modules in Python. Other than that, I learnt TCL and Bash.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The work was entirely online on a virtual desktop infrastructure (VDI). We had our own working spaces and Linux directories where we could run codes locally before checking them into common directory. We majorly worked in Python, TCL and Bash. We did not really have any training; rather we directly worked on small scale projects and learnt along the way. The team members were really helpful and were ready to help us whenever required. After a few weeks, we were able to do most of the implementation ourselves. We had weekly team meetings and daily meetings with our mentors, and we were expected to give an update in all meetings. The tests we developed were implemented on a central framework, and because of this, we even got a chance to interact with teams in the USA and Ireland.

Academic courses relevant to the project: OOPS, DSA, FPGA Lab.

Name: RAHUL RAJENDRA SHANBHAG(2017AAPS0995G)

Student write-up

Short summary of work done during PS-II: The work included two projects. The first one involved understanding the Vitis build flow so that the runtime could be improved. Runtime can be improved for small changes by using the incremental compile functionality of Vivado, but it can also be done by reusing cell placement for multiply instantiated kernels. The project required us to note runtime differences for various testcases using incremental compilation. The second project involved using Javascript and HTML to make a dashboard where relevant data for various testcases could be displayed and analysed together. The data generated by these testcases were imported to the Hyderabad server and the Hyderabad dashboard was used as a template for this dashboard.

Tool used (Development tools - H/w, S/w): Vivado Design Suite, Linux Shell, JavaScript, HTML.

Objectives of the project: 1. To reduce runtime of Vitis build flow by improving incremental compile functionality 2. To create a dashboard to display various testcase data that can be viewed and analysed together.

Major learning outcomes: Learnt about Vitis build flow and to correlate Vitis code with implemented design. Learnt to use HTML and JavaScript to create basic web elements.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment is very good. The managers and mentors are always ready to help and no deadlines are enforced. Employees are expected to work and learn on their own and the

company's interests with guidance always available. Meetings are held frequently to sync-up and decide timelines and objectives. Apart from the managerial hierarchy, all employees are treated equally and a positive work environment is encouraged.

Academic courses relevant to the project: C Programming, Digital Design, Computer Architecture.

PS-II Station:Young Man India, New Delhi

Faculty

Name: Prof. Nithin Tom Mathew

Student

Name: SHIVAM KUMAR(2019H1410103G)

Student write-up

Short summary of work done during PS-II: We were assigned to the team which worked on new product development for the organisation. The product we were working on was a variable height movable platform. The team was tasked to identify the design requirements of that particular product by analysing the current market availability. We were tasked with modelling the product in 3D-modelling software and make a complete assembly of the product. We did various strength and structural analysis of different parts designed.

Tool used (Development tools - H/w, S/w): Solidworks & Ansys Mechanical.

Objectives of the project: New Product Development, Design & Analysis.

Major learning outcomes: The inner workings of a team in an organisation & how to share your ideas in such a set up.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The atmosphere in the company was very welcoming. The people were easy to approach and always happy to help. There are expectations on you to be able to deliver what is asked to you, which is actually a good things as people push you to do better. Overall, the six months here has been a good first step into understanding how industry works.

Academic courses relevant to the project: FEA, CAAD.

PS-II Station:Zendrive India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Chennupati Rakesh Prasanna

Student

Name: AMISHA KOTHARI(2017A3PS0194P)

Student write-up

Short summary of work done during PS-II: I worked with data science team on motorcycle detector. As a part of my starter project, I analysed the performance of deployed models on data of different geographies and user feedback data. Then, on the basis of findings and other insights, my main project was to update the current model so as to improve detector performance. Later, run the new model on field feedback dataset and analyse the results thoroughly.

Tool used (Development tools - H/w, S/w): Python, Git, Pyspark, Pandas, Scikit-learn.

Objectives of the project: Analysing the in-place motorcycle detector model and then come up with updated model which gives better performance.

Major learning outcomes: The major learnings in terms of tech stack was getting well versed with various machine learning libraries. I also got full insight into data handling and data cleaning which is the most crucial part in data science. Apart from that, I had hands-on model building process, various performance analysis and modular code writing. I learnt about various other algorithms apart from my project during the knowledge sharing sessions.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Zendrive has a perfect work culture. People are really open to ideas, friendly and help you learn. They also have knowledge sharing sessions where you learn about algo/work other people are working on. You'll be working on things that are directly being used in production. Apart from that, they ensure proper work-life balance.

Academic courses relevant to the project: Foundations of Data Science, Probability and Statistics, DSA.

PS-II Station:Zeotap India Pvt. Ltd., Bangalore

Faculty

Name: Prof. Ankur Pachauri

Student

Name: MALAIKA RASTOGI(2016B1A70926P)

Student write-up

Short summary of work done during PS-II: I interned with the Data Engineering team. The team creates and maintains data pipelines, and also organises, processes and manage big data coming from the data partners. Got very good learning experience while understanding various layers of data processing and how the whole data gets ingested. Worked on various projects which included data ingestions and data migrations. Also, worked along with my team to develop a library using functional programming which can act as a framework for the users to put expectations on the incoming data and validate hundreds of combinations of datasets through it. The library is very much extensible and we developed a testing design using behaviour driven properties so that datasets can be tested exhaustively.

Tool used (Development tools - H/w, S/w): Scala, Apache Spark, Hadoop, Google Cloud Platform, SQL, Functional Programming, Cats Library.

Objectives of the project: To provide solutions to high scale data problems.

Major learning outcomes: Functional Programming, Big Data, Scala, Apache Spark.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Working environment is good. Team mates are very helpful and got good learning experience. Also, interns got to work on same live projects and products as any other full time employee. Work becomes little hectic and can expect long working hours.

Academic courses relevant to the project: DSA, OOP, Database Management Systems.

PS-II Station:Zeta (Directi), Bangalore

Faculty

Name: Prof. Chennupati Rakesh Prasanna

Student

Name: NAMAN DEEP SRIVASTAVA(2016B4A70891P)

Student write-up

Short summary of work done during PS-II: Worked mainly on 3 projects:

1. Standardisation of logs across all ingress points to perform analytics on the generated logs.
2. Generation of in-house Cloudflare dashboards using GraphQL to allow role-based access to Cloudflare metrics to the internal team, as opposed to in-built Cloudflare analytics dashboard.
3. Docker scanning and security pipeline: Ensuring regular scanning and updation of vulnerability reports for the images present in AWS ECR and also making them available to different consumers within the organisation for compliance and audit purposes.

Tool used (Development tools - H/w, S/w): Nginx, Fluentd, ElasticSearch, Logstash, Kibana, Grafana, ELK, EFK stack, Docker, Kubernetes, GraphQL.

Objectives of the project: To standardise the logs across all ingress points within the organisation, allow internal teams to access Cloudflare metrics via an in-house dashboard and to implement docker scanning and security pipeline to allow periodic scanning of ECR images, fetching of respective vulnerability reports and exporting them to respective consumers.

Major learning outcomes: Understood micro-services, Docker, Kubernetes, various AWS tools and technologies. Collaborating between multiple teams to deliver the project.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: I joined Zeta as an intern in the Ops infra team dealing with Production Engineering. The onboarding was pretty smooth and gave brief overview of all the products that the organisation deals with. The work environment is good with really helpful and friendly team mates along with flexible

schedule. The PPO offered for the DevOps role differs from that of SDE role, so if someone is considering joining Zeta as FTE after PS, he should make a wise choice while selecting the project and the team in the beginning.

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

Name: MRINAL PRADHAN(2017A7PS0453H)

Student write-up

Short summary of work done during PS-II: My work here comprised of two parts. The first part was to work on tracing in distributed systems or distributed request tracing. This is used to track the course of a request or a call end to end from one microservice to another in a distributed system architecture, which in turn helps to find failures, bottlenecks and latencies of the APIs used. I had to generate the proper tracing logs, persist them and also integrate it with a tool to visualise it. This was deployed to the production level.

The second part of my work was to write SQL queries and build data models for data warehouse which would be used in business intelligence analytics. I also had to generate and publish these reports.

Tool used (Development tools - H/w, S/w): Sleuth, Java, Spring Boot, Postgres, Elastic Search, Kibana, Zipkin, Redshift.

Objectives of the project: Integrate distributed tracing in the services and generating reports for business intelligence analytics.

Major learning outcomes: Tracing, Reports, ELK Stack.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Comfortable, good pace, and helpful people. They do expect the work to be completed as per deadlines though.

Academic courses relevant to the project: Software Engineering, DBMS, OOP.

PS-II Station:Zetwerk Manufacturing Businesses Pvt. Ltd., Bangalore

Faculty

Name: Prof. R. S. Reosekar

Student

Name: NITISH VERMA(2019H1410551G)

Student write-up

Short summary of work done during PS-II: The objective of the project was to prepare a detailed report on capabilities needed for manufacturing each category of products/equipment including FRP/composite items. It should cover plant capacity, equipment sizing, storages, plant auxiliaries, system engineering, electrical engineering, manufacturing engineering, control & automation engineering, quality control & assurance, etc. based on the requirement.

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

Objectives of the project: To prepare a detailed report on capabilities needed for manufacturing each category of products/equipment including FRP/composite items.

Major learning outcomes: Understood about defense industry.

Building technical know-how a bucket of products being used in defense and applying academic knowledge for practical purposes.

Gained experience of evaluating opportunities in indigenous manufacturing & partnerships in defense sector.

Inputs in strategy formation to build a defense business vertical.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Due to pandemic last three months I am working from home. But in the first half, I was in the Bangalore office. Working environment was good there. PPO will be given on the basis of performance only.

Academic courses relevant to the project: Advanced Composite Materials.

Name: PRATIK DASHORA(2019H1420135P)

Student write-up

Short summary of work done during PS-II: The project is based on performing a full-fledged techno-economic feasibility study of coach factories in India working for Railways and Metros. The work is based on business development where the relevant tenders are sourced, the awardee data are also captured for the opened tenders and then the management takes the decision for which tender to bid. The project also includes preparing the assemblies in Siemens NX for 3D modelling of coaches.

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

Objectives of the project: To carry out a full-fledged techno-economic feasibility study of coach factories in India.

Major learning outcomes: Learnt about business development and also skills related to 3D modelling software- Siemens NX are gained.

Details of papers/patents: No paper is presented

Brief description of working environment, expectations from the company: Zetwerk provides very good working environment and good sense of responsibility. Employees here are very helpful. Need to have good soft skills and data representation skills.

Academic courses relevant to the project: Supply Chain Management.

PS-II Station:ZF Wabco, Chennai

Faculty

Name: Prof. Shree Prasad Maruthi

Student

Name: ASHWIN SWAMINATHAN. S(2019H1410085G)

Student write-up

Short summary of work done during PS-II: The projects ideology was mainly focused on design and analysis. The first project deals with designing a bush press where the ideology from generating a concept in mind and implementing it in reality by analyzing it using ANSYS software before giving it to the supplier end for manufacturing. Standardization of fixtures explains how a fixture can be used to locate and orient the workpiece. Alongside with the number of degrees of freedom that need to be restricted before any operation is performed is studied. Along with this how to detail using creo software by converting 3D model into 2D was also studied.

Tool used (Development tools - H/w, S/w): Ansys, Creo, AutoCAD.

Objectives of the project: To design a bush press that could withstand the required load and to standardize the fixtures in crankshaft 318cc cell.

Major learning outcomes: Complete study of crankshaft line is done to identify the number of variants manufactured in a single line. Each variant requires different fixtures for holding and orientation. Standardization of these fixtures was done so that the lead time for designing has been drastically reduced. Along with this the number of machines required for the line was also studied and the operations performed in it. These studies lead to indexing type fixtures design so that these operations can be minimized. Universal design for all crankshaft cells was made.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The working environment was majorly positive. All the faculty were extremely supportive. Good workplace communication. During pandemic period, the Covid protocols were followed correctly and company were extremely supportive. Expectation from the company was to be punctual and to frequently communicate with the faculty for discussing about the project.

Academic courses relevant to the project: FEA, Material science and TOEP.

PS-II Station:Zinnov Management Consulting Pvt. Ltd., (Non-Tech), Bangalore

Faculty

Name: Prof. Annapoorna Gopal

Student

Name: IYER AMADHYA AMUTHAN(2016B2A10661H)

Student write-up

Short summary of work done during PS-II: Working in AI based organization focusing on talent consulting.

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

Objectives of the project: Assist the team in deliverables and weekly data push.

Major learning outcomes: Cohesive team environment, people skills.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Supportive environment. People are helpful. Company expects you to be available for tasks and ensure that deliverables are met.

Academic courses relevant to the project: NA

Name: PURAMSETTI VENKATA UDAY MANIKANTA SAI(2017A1PS0336G)

Student write-up

Short summary of work done during PS-II: I am added to the service provider team. So, basically we have to collect the data and should enter in an excel sheet. This data we have to identify using different sources. Sometimes they asked to prepare presentation regarding certain topic. Here the data refers to the information of a particular company and was divided into different columns.

Tool used (Development tools - H/w, S/w): Ms-Excel, Ms-Power Point Presentation.

Objectives of the project: Market studies concerning and catering to businesses of all sizes and verticals.

Major learning outcomes: Research skills, Advanced features of presentation.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The work environment is nice. As we have done work from home there is no difference in the environment but you will miss some of the culture. The team is good and interactive with us nicely. Whenever we do some mistakes in the earlier stages can be explained by them, later they will explain us in a different way. Stipend is decent and will be credited every month by the first or second of the month. I can say that the workload in the earlier days is decent and going on there will be a little increase and also the weekends are off so that we have to work for five days.

Academic courses relevant to the project: Nothing related to my sector. But there will be some courses related to different sectors in the company.

Name: NATARAJAN KRISHNA(2017A1PS1150P)

Student write-up

Short summary of work done during PS-II: I had worked on 7-8 different MNC client engagements for the CoNXT team, majority of whom are the CVC arms of these companies. My primary job was to scout and source startups for their innovation programs, apart from which in some engagements I also had the opportunity to be present on the engagement calls along with my mentor/ manager and also took up few startup calls and lead roles in calls myself. Furthermore, I have interacted with India and (sometimes) global leadership for some of my engagements. Apart from the primary innovation consulting, I also worked on internal IPs and databases for the team, and helped them refine many internal processes. I also brought about changes to processes to improve overall efficiency of the process.

Tool used (Development tools - H/w, S/w): MS Excel, Data miner (web scrapping), Paid databases (Crunchbase, Tracxn, CB Insights and more), MS Access (SQL), MS Office Suite.

Objectives of the project: For my PS-II project, I primarily chose the engagement with GE Healthcare India. A key part of what I done was called open innovation, and my objective was to study open innovation from a consultant's perspective.

Major learning outcomes: I was able to collect many insights from my study with GE Healthcare India. The concept of open innovation is necessary in the present day for MNCs like GE because majority of innovation occurs in the startup ecosystem and a management change towards startup collaboration is necessary. Only then will the stagnant market position, with respect to innovation and growth for MNCs, will change and they can then leverage the startup technology to roll out new products into the market and solidify their position.

From a consultant's perspective, it is interesting to see the change in leadership and management, which especially picked up since the pandemic. Many startups didn't have funding and were struggling, but many CVC arms of companies were eager to fund them and mentor them. There is currently a boom in the innovation space, and slowly but steadily many CVC companies are slowly looking towards open innovation from boutique consulting firms like Zinnov, who not just consult but also make sure the consulted advice is put into effect.

Details of papers/patents: My paper primarily focuses on the open innovation adoption by MNCs. The key focus here is to see how various MNCs are slowly developing CVC arms and innovation programs to foster collaboration between startups and groom the future of tomorrow.

Brief description of working environment, expectations from the company: It was very nice work environment, wherein everyone I had interacted with have been really friendly and supportive. There wasn't a typical organizational distinction of boss and subordinate, but here it was much more inclusive and friendly work culture. The work given was dependent on your merits, so since I was helping the organization a lot, I got lot of different and more critical engagements to work on. There is high chance of converting to PPO if you work well enough and your principal likes you. HR is also very supportive with regards to this.

Academic courses relevant to the project: None

Name: MANAV GANDHI(2017A3PS0234P)

Student write-up

Short summary of work done during PS-II: I worked on multiple databases mapping stakeholders from different companies under different categories.

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

Objectives of the project: Studing GCoE (global center of excellence) environment.

Major learning outcomes: MS Excel and mail merge.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Nice working environment, great mentors.

Academic courses relevant to the project: EG

Name: CHINMAY NEMA(2017A3PS0337P)

Student write-up

Short summary of work done during PS-II: Performed location analysis for different job roles in different companies in United States to report compensation information.

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

Objectives of the project: Compensation analysis at the given location.

Major learning outcomes: Performing through secondary research.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Decent working environment, long hours.

Academic courses relevant to the project: No

Name: ARPIT RAJVANSI(2017A3PS0456G)

Student write-up

Short summary of work done during PS-II: The work majorly revolved around surfing the web, gathering information, market sizing and putting the stuff gathered and inferences into reports and presentations.

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

Objectives of the project: To provide an overview about the existing market, potential competitors and scope of the particular domain if the client decides to enter into it.

Major learning outcomes: Market sizing, Extrapolating data, Making informative presentations, Effective communication with the client.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The work environment was good, the mentors and senior team members were quite helpful and approachable.

Academic courses relevant to the project: None

Name: UPPADA AVINASH(2017A3PS0902G)

Student write-up

Short summary of work done during PS-II: Scouting Service Providers(SP'S) those deal in digital engineering and R & D e-fields. Conducted secondary research on service providers that serve across various verticals or industries (like bfsi, healthcare, telecom, media) and provide solutions to clients. Building reach out trackers that consist of stakeholder contact details and their positions. Worked on TCS, Intive and Sonata software project. Core responsibilities include feeding the databases with details of service providers as per the client's requirement. Worked on digital agencies project for Intive.

Requirements: Digital consulting, Design – UI/ UX, Mobile App and Web Development, Digital Transformation, Innovation Consulting, Product Design, Service Design, Cloud App Development, Digital Marketing, Design Experience, Digital Experience.

Presence: Service providers having a presence across US, Canada and Europe.

Revenue Range: Between 5 and 30 million.

Digital agencies are fetched from Zinnov and CapitalIQ databases in April. Finished the project by scouting companies from external databases like the manifest, clutch, Good firms, cloud rush, cloud ways and digital agency network by the end of May. Attended client calls with companies like SimTLiX and LLP Group. A new project for TCS was assigned on 31st May 2021.

Given below are the requirements: 1. Requirements: Game testing, Game Design – UI/ UX, Gaming Experience and Game Development 2. Presence: Service providers having a presence across the world except Africa 3. Revenue Range: Between 5 and 100 million. Finished this project and submitted to mergers and acquisitions team.

Tool used (Development tools - H/w, S/w): Sales navigator, sale QL, Microsoft excel, LinkedIn, secondary research, Powerpoint and CapitalIQ.

Objectives of the project: Mergers and acquisitions help organizations in obtaining quality staff or additional skills, knowledge of the industry. Accessing funds or valuable assets for new development - Lets us know if business is underperforming - Accessing a wider customer base and increasing market share. Primary reason why companies merge is to share information, technology or other resources thereby increasing the overall strengths of the company and gain the competitive edge in the market. Our project helps organization to expand its services to one more field by giving their clients the best researched databases(i.e., solutions) through mergers and acquisitions.

Major learning outcomes: Working as a consulting analyst in this firm helped me understand the skills and expertise that various sectors demand. Having worked with four major projects in this firm helped me attain following skills.

Learnt how to use tools in conducting primary and secondary research effectively.

Understood how investments and acquisitions work in companies. Drawing conclusions on the basis research conducted on market cap and headcounts + billings rates of different countries.

A deeper understanding of who are actual service providers in cloud space i.e., pure players in cloud developments and integrations.

Understood what type of data needs to be collected while providing better solutions.

Usage of statistical methods and conducting secondary research to collect data.

Understood different business strategies, and their effectiveness in making decisions.

Making impressive presentations and presenting them as well as writing reports.

I acquired knowledge related to several industries.

Reaching challenging goals by meeting deadlines.

Working with the M&A team to implement changes.

Details of papers/patents: The projects I worked on involved a lot of secondary research, and hence Zinnov management consultancy will have a lot of databases and presentation reports of the work we performed on different projects.

Brief description of working environment, expectations from the company: The work was challenging yet fun. My experience as an intern was above my expectations. Fairly enough deadlines (Even no deadlines sometimes) and good work-life balance. Thankfully, I got interesting projects and are not monotonous. I strongly believed that there's a lot of scope to

learn from the experienced folks present on each team which not only would help me to grow professionally but also provide better service to the company.

Academic courses relevant to the project: Marketing Research, Fundamentals of Finance and Accounting, Principles of Economics, Digital Design, Modern Communication Technologies and Optimization.

Name: PIKLU PAUL(2017A7PS0006P)

Student write-up

Short summary of work done during PS-II: Deep dive analysis of the companies having shared services presence in India to provide strategic approach to the clients. I have worked on two POVs related to shared services - HR and Finance. It was a great experience working in Zinnov, being a part of such a helpful team and gaining exposure to the world of consulting.

Tool used (Development tools - H/w, S/w): LinkedIn Sales Navigator, DRAUP, Microsoft Office.

Objectives of the project: Workload analysis of the shared services across functions.

Major learning outcomes: Industry exposure and knowledge, Market research, Data collection and analysis, Decision making.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Zinnov is an excellent place to work in. Nice set of people with many valuable suggestions were given. There was no hierarchy, so can reach out to anyone regarding any doubts. However, sometimes the working hours get extended depending on the client deliverables.

Academic courses relevant to the project: Market Research, POE, FundaFin.

Name: GRANDHI AMSHUDHAR(2017A8PS0612H)

Student write-up

Short summary of work done during PS-II: I was placed in the digital division of Zinnov where the work revolved primarily around secondary research related to BFSI and payment sectors. Interns were required to help in building market research reports and also prepare the final deck to be delivered to the clients. During the course of internship, interns are exposed to a wide variety of clients and projects.

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

Objectives of the project: Providing market research about various products where our clients are going to venture in or re-strategize their current product.

Major learning outcomes: 1. Basic deck making for multi-facet analysis 2. Excel based analytical skills 3. A broad idea about BFSI sector and latest technologies like blockchain etc.

Details of papers/patents: Nil

Brief description of working environment, expectations from the company: As in any consulting firm, the work hours at Zinnov are quite hectic. The projects at the company are simple but time-consuming. Interns are expected to put in long hours when required but timings mainly depend on the requirements of clients and manager.

Academic courses relevant to the project: Technical report writing.

Name: NAMAN GUPTA(2017AAPS0991G)

Student write-up

Short summary of work done during PS-II: Designed reports on technology trends in various industries for technology service provider companies.

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

Objectives of the project: Understanding market opportunities in short and long term for clients in a particular industry.

Major learning outcomes: Learnt how to structure, analyze information and present it in an effective manner.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The company work culture and atmosphere is brilliant. Colleagues are very helpful and understanding.

Academic courses relevant to the project: None

Name: SOMLINA MUKHERJEE(2017AAPS1238H)

Student write-up

Short summary of work done during PS-II: • Worked on various requests from our top clients such as Amazon, Stryker, Telus, British Telecom and Nasdaq.

• Provided data-driven and analysis rich deliverables, deriving strategic insights as per client requirements.

- Key responsibilities include: Talent analysis, market sizing, location-wise deep dive, fresh talent supply, cost analysis etc.
- Re-skilling of impacted job roles of various industries to new-age job roles such as Data Science, AI/ML, Analytics.
- Assessment of digitization trends in various sectors such as BFSI, Healthcare, Enterprise Software, IT, Telecom etc.

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

Objectives of the project: The objective of a particular project varies with the requirements of various client stakeholders. I have worked on multiple projects throughout my tenure in the organisation.

Major learning outcomes: Market sizing, Talent analysis (Location-wise & Industry-level), Talent re-skilling, Assessment of digitization trends in various sectors such as banking, IT, software etc., drawing organizational structures of various job functions across companies.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The company has a very good work culture and work environment with extremely supportive mentors who provide ample opportunities to learn and enhance your skills, work on various projects catering to the requests of client stakeholders, presenting your ideas and being present in the client-customer calls. But one has to be prepared to work in a timeline bound high pressure environment with work/calls extending up till late in the evening.

Academic courses relevant to the project: Principles of Management, Strategic Management, Negotiations.

PS-II Station:Zinnov Management Consulting Pvt. Ltd., (Non-Tech), Gurgaon

Faculty

Name: Prof. Annapoorna Gopal

Student

Name: PRATEEK AGRAWAL(2016B1A10627G)

Student write-up

Short summary of work done during PS-II: Making consulting slides, data entry in excel, secondary research (Google Search).

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

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.

Details of papers/patents: None

Brief description of working environment, expectations from the company: Since it was WFH, no fixed working hours but they will give enough work to keep you 7-8 hours occupied 5 days a week.

Academic courses relevant to the project: None

Name: SONAWANE NEERAJ MILIND(2017A3PS0433G)

Student write-up

Short summary of work done during PS-II: I was a part of digital team of Zinnov that mainly deals with tech & IT clients and helping with solutions. I was engaged with multiple projects during my time at the firm. Always got good feedback from my seniors.

Tool used (Development tools - H/w, S/w): PowerPoint, Excel, Sales Navigator, Draup, Naukri.com.

Objectives of the project: Exceed client's expectations.

Major learning outcomes: Interpersonal skills, Critical thinking.

Details of papers/patents: No papers were published and the deliverables provided by the company to its clients are confidential.

Brief description of working environment, expectations from the company: The working environment was pretty normal routine with times of extended work hours. Overall, the company takes good care of your interest in the work by having some fun activities every weekend.

Academic courses relevant to the project: Principles of Management

PS-II Station:Zluri, Singapore

Faculty

Name: Prof. Manoj S Kakade

Student

Name: YATHARTH SINGH(2016B2A20845P)

Student write-up

Short summary of work done during PS-II: The project involved handling the whole backend server side coding for the SaaS management dashboard web application, including ideating the database collections and their schemas, then making and using them to write usable APIs as per company requirements.

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

Objectives of the project: 1) Writing APIs as per requirements 2) Making database collections and ideating over its schema 3) Testing APIs to make sure they wont break on corner cases.

Major learning outcomes: 1) Server side coding 2) NoSQL database querying 3) API testing.

Details of papers/patents: None

Brief description of working environment, expectations from the company: The work is fast paced and a lot of learning takes place over the entire PS-II. Deadlines are fixed on a weekly basis, with progress tracking meetings everyday.

Academic courses relevant to the project: None

Name: ADITYA SINGH(2016B3A80300G)

Student write-up

Short summary of work done during PS-II: I joined the frontend team which is responsible for building the user interface for Zluri web application. Tasks were assigned via the project management App named JIRA. I was assigned the tasks of fixing the bugs and adding new features on the UI.

Following are the new features that I contributed to the UI –Multi-currency support with number formatting, Export CSV, bulk update data, search with special characters, resend invitation.

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

Objectives of the project: Developing UI of a web application using React.

Major learning outcomes: JS, HTML+CSS, React, Redux, Node.JS

Details of papers/patents: None

Brief description of working environment, expectations from the company: The work environment was very positive and it promoted employee safety, growth and goal attainment. Employees are heavily encouraged by the work environment to perform to their highest ability. My expectations for the company was that it would provide me with a work environment in which I can contribute to the team and enable me to grow and learn with the company.

Academic courses relevant to the project: None

Name: TEJASWINI JUPUDI(2017AAPS0418G)

Student write-up

Short summary of work done during PS-II: Design and development of a dashboard for internal consumption. Writing queries, data transformation and visualization of key data points

required to draw insightful conclusions about the usage of the product. Also, writing pipelines and queries to facilitate the same.

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

Objectives of the project: To analyze and project key data points required to gain insights about product usage.

Major learning outcomes: Data visualization, Aggregation and queries, Scripting in Python.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: Mode of operation was WFM. Daily connects bridges the disconnect associated with working from home. People are putting in effort to communicate issues. As is the nature of a start up, the environment demands for high productivity. To continue exploring and updating with trends in the data world.

Academic courses relevant to the project: None

PS-II Station:Zwende Design Tech Pvt. Ltd., Bangalore

Faculty

Name: Prof. Srinivas Kota

Student

Name: MANTRA MANAN SARASWAT(2016B5A20641P)

Student write-up

Short summary of work done during PS-II: I worked as a product & growth analyst and Zwende being a startup, there were lot of different projects I worked on in my 1 year stint at Zwende. I worked with a lot of data to provide insights and strategize on marketing campaigns and optimize our growth channels. Additionally, I also picked up new growth channels and grew them from scratch. I had the opportunity to talk to international experts and coordinate with them on various projects. I worked with the team on a major site migration project where I personally coordinated with the external body's product team to set up our reporting requirements.

Tool used (Development tools - H/w, S/w): Mixpanel, Amplitude, Google Analytics, Data Studio, Clarisights, Hotjar, Fullstory, Thinkific, Python and its various libraries, APIs.

Objectives of the project: Growth Marketing & Product Management.

Major learning outcomes: There are too many learning outcomes to count. From learning and operating the industry standard Saas tools, to getting access to tonnes of data and research tools. I also got access to certain industry leading newsletters, seminars and chances to interact with business stalwarts on one on one basis. It has been an incredible learning experience overall.

Details of papers/patents: NA

Brief description of working environment, expectations from the company: The senior management are very accommodating and give you enough time to learn and develop, Mistakes are acceptable but not if repeated. Hours are sometimes long and hectic but overall, it has been a very good learning experience. Just talking to the senior management on a regular basis has provided me lot of learnings, insights into the startup world and how to grow a business.

Academic courses relevant to the project: Not really! Most of the learnings were on the spot.
