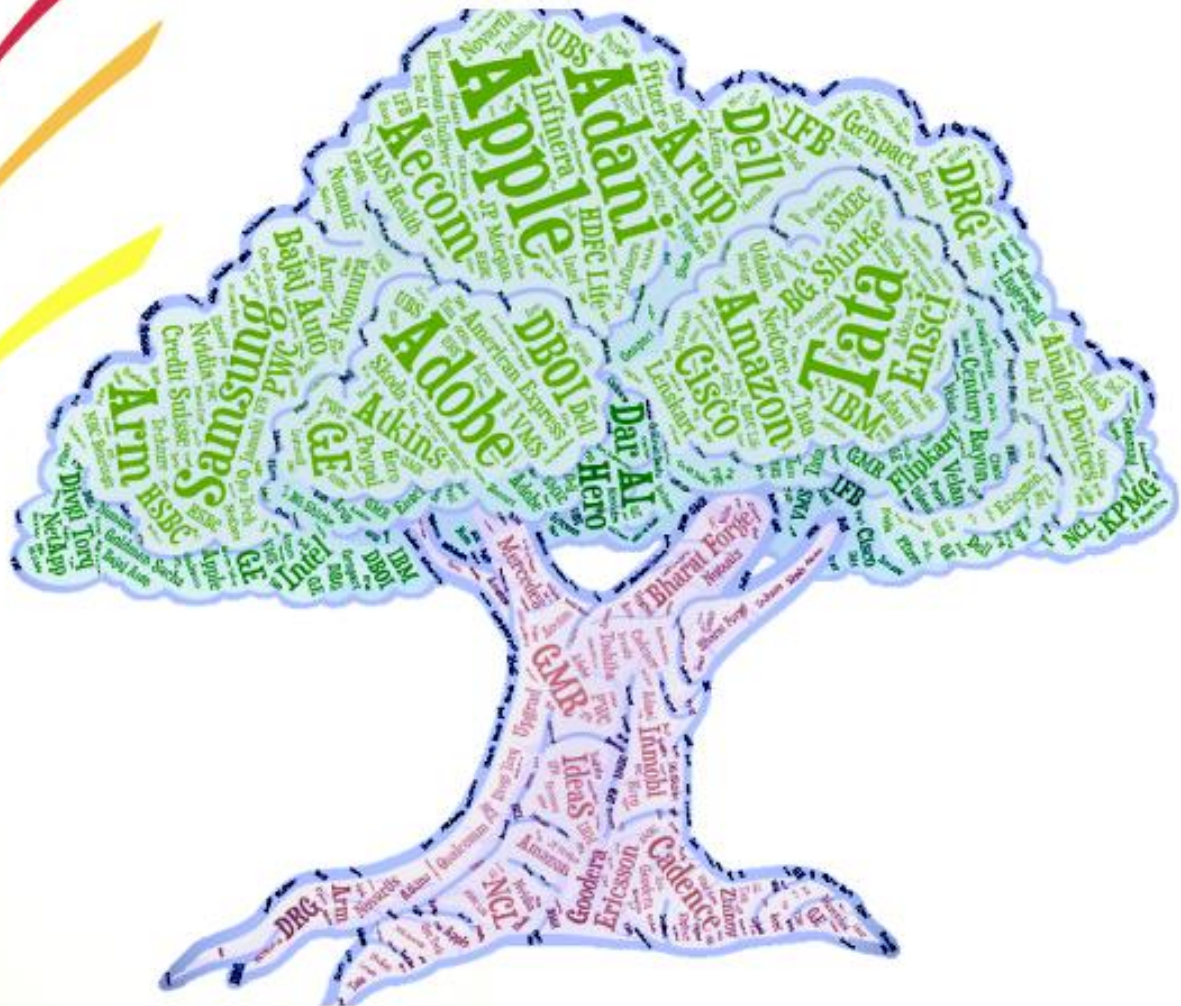




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Practice School Division

PRACTICE SCHOOL - II

CHRONICLES



Publication Cell
- Practice School Division

From the Desk of the Editor

It is my great pleasure to bring forth the 9th edition of the PS Chronicles. This edition features over 582 articles from mentors, students and PS faculty sharing their experience of Practice School-II held during the II Semester of 2019-2020. 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 Chronicles is to record the overall PS-II experience of all the stakeholders – the students, the PS faculty and the Industry mentors.

The objectives of this Chronicle are manifold

- Prospective PS-II students can get to know about the experience of their seniors, currently at PS – thereby increasing awareness in the student community.
- Increasing awareness among faculty about the nature of work happening in various PS station.
- Bring back the experience gained in PS 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 9th 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 his 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: Megha Agarwal(2018H1400132G)	483
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Name: R Deepika(2018H1400180G)	485
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Name: Gopala Krishna Koneru.....	486
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Name: MOKILI DEEPAK(2018H1030121H)	488
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Name: HARITA(2018H1230219H).....	496
Name: HITHESH H L(2018H1230223H)	497
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Name: Mahesh K Hamirwasia.....	498
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Name: RANKARAJAN B(2018H1430034H)	498
Name: MEHTA MANISH MANOJ(2018H1430041H).....	499
Name: AYUSH VIDYARTHI(2018H1440039P)	499
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Faculty	500
Name: Vijayalakshmi Anand.....	500
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Name: AKAASH MOHAN SAXENA(2015B1A80831H).....	500
Name: RAJ BAKULBHAI JOSHI(2018H1030101H)	501
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Name: Ashish Narang.....	503
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Name: MAYANK SHARMA(2016A8PS0414G).....	503
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Faculty	504
Name: Lucy J. Gudino.....	504
Student	504
Name: MAYANK BHUTANI(2015B2A30836P)	504
Name: GONDIMALLA APOORVA(2015B2A70650G)	505
Name: AYAN DUTTA(2016A3PS0174P)	506
Name: MOHITH T S(2016A3PS0213P)	507
Name: SRI MAHIJA MANDALIKA(2016A3PS0251H).....	507
Name: GAURAB DAS GUPTA(2016A3PS0255H)	508
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Name: ETI MISHRA(2018H1030049G)	510

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Name: YARLAGADDA GEETA DHARANI(2018H1030099H).....	511
Name: SINGH DEEPENDRA INDRAHAHADUR(2018H1030132P).....	512
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Name: ISHA GAUR(2018H1240096P)	517
Name: KUSHAGRA GOUTAM(2018H1240100P).....	518
Name: RAWOOL VISHAL SHIVRAM(2018H1240104P)	519
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Faculty	521
Name: Anita Ramachandran	521
Student	521
Name: MACHE PARTH AJAY(2015B3A30609P)	521
Name: VANKADARA NAVEEN KUMAR(2016A3PS0313H)	522
Name: AKHILESH SINGLA(2018H1120260P).....	523
Name: DEEPAK PANDEY(2018H1230161G).....	523
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Faculty	524
Name: Anita Ramachandran	524
Student	524
Name: ASHISH PRATAP SINGH BHADORIA(2016A8PS0400P)	524
Name: ANKIT SRIVASTAVA(2018H1230212H).....	525
Name: MAYANK KUMAR(2018H1240072H)	527
Name: DEEPESH CHANDWANI(2018H1240075H)	527
Name: KRUSHNALI DHANRAJ BHOSALE(2018H1240109P)	529
PS-II Station: SAP Labs, Bangalore	530
Faculty	530
Name: Seetha Parameswaran	530
Student	530
Name: SMITH RAJESHKUMAR SHAH(2016A7PS0039P)	530
Name: VATSAL JIGNESH BADAMI(2016A7PS0071P)	531

Name: SANCHIT SHRIVASTAVA(2016A7PS0072P).....	532
PS-II Station: Servicenow Software Development India, Hyderabad.....	533
Faculty.....	533
Name: Y V K Ravi Kumar.....	533
Student.....	533
Name: SHAHEER AZAM(2015B4AA0621H)	533
Name: SIVARAJU VENKATA RAVITEJA(2018H1030096H)	534
Name: MANAV SETHI(2018H1030119H)	535
PS-II Station: Shell Technology Center, Bangalore	536
Faculty.....	536
Name: K Santosh Sopanrao	536
Student.....	536
Name: KARTIKEYA ADITYA(2016A1PS0740P)	536
PS-II Station: Siemens PLM Software, Pune	537
Faculty.....	537
Name: Sudeep Kumar Pradhan.....	537
Student.....	537
Name: HARSHAN JAYAKUMAR(2018H1410131H).....	537
Name: KARAKE ROHIT RAOSAHEB(2018H1410150P)	539
PS-II Station: Siemens Technology and Services Pvt. Ltd., Bangalore	540
Faculty.....	540
Name: Pradheep Kumar K	540
Student.....	540
Name: MAYANK GAUR(2018H1060161H)	540
Name: KIRANGE PIYUSH PRASHANT(2018H1060167H).....	541
PS-II Station: SMEC India Private Limited., Gurgaon	542
Faculty.....	542
Name: Mahesh K Hamirwasia.....	542
Student.....	542
Name: SHUBHAM BHATNAGAR(2018H1300076P).....	542
Name: YASH RASTOGI(2018H1300086P)	543
PS-II Station: Solar Energy Corporation of India, Delhi.....	544

Faculty	544
Name: Mahesh K Hamirwasia.....	544
Student	544
Name: ANKUR GOYAL(2018H1430064P)	544
PS-II Station: ST Microelectronics (I) Pvt. Ltd., Greater Noida.....	545
Faculty	545
Name: Rajesh Kumar Tiwary	545
Student	545
Name: Ganesh Prasad B K(2018H1230151G)	545
PS-II Station: Strand Life Sciences Pvt. Ltd., Bangalore.....	546
Faculty	546
Name: Bharathi R	546
Student	546
Name: SHREYA BANERJEE(2018H1290003P)	546
Name: ADITHYA M(2018H1290005P).....	547
PS-II Station: Synopsys (India) EDA Software Pvt. Ltd., Bangalore	548
Faculty	548
Name: Vineet Kumar Garg.....	548
Student	548
Name: SRISAI ANIRUDH IRUVANTI(2018H1230202H)	548
PS-II Station: Tata Digital Health, Bangalore.....	549
Faculty	549
Name: H. Viswanathan	549
Student	549
Name: Ritik Bansal(2015B1A30750G)	549
Name: ANKUR INDAULIYA(2016A4PS0410H)	550
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Faculty	551
Name: R S Reosekar	551
Student	551
Name: PATIL PARTH TUSHAR(2016A4PS0277G)	551
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Faculty	552
Name: Arun Maity	552
Student	552
Name: PATIL NILESH RAVIKANT(2018H1410151H)	552
PS-II Station: Tega Industries, Kolkata.....	553
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Name: Arun Maity	553
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Name: SAPTARSHI CHAUDHURI(2018H1410153P).....	553
Name: SHUBHAM PARETA(2018H1410159P)	554
PS-II Station: Tejas Networks, Bangalore	556
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Name: H. Viswanathan	556
Student	556
Name: CHILUKURI SRINIVAS HARSHA(2018H1230153G).....	556
Name: Muktha Padakandla(2018H1230164G).....	557
Name: Susmita Pal(2018H1230165G)	558
Name: Renuka Harishchandra Ramrakhiani(2018H1400122G).....	559
Name: Surbhi Malani(2018H1400138G).....	560
PS-II Station: Texas Instruments (I) Pvt. Ltd., - Systems, Bangalore	561
Faculty	561
Name: Satya Sudhakar Yedlapalli	561
Student	561
Name: AKHIL NORI(2016A3PS0106G)	561
PS-II Station: Texas Instruments (I) Pvt. Ltd., - Analog, Bangalore	562
Faculty	562
Name: Satya Sudhakar Yedlapalli	562
Student	562
Name: ABHINAV S(2015B5A30490P)	562
Name: Siddhant Laddha(2016A3PS0191P)	563
PS-II Station: Thornton Tomasetti, Mumbai	564
Faculty	564

Name: Mahesh K Hamirwasia.....	564
Student.....	564
Name: JHAVERI RONAK KIRTIKUMAR(2018H1430036H).....	564
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Faculty.....	567
Name: Nithin Tom Mathew.....	567
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Faculty.....	568
Name: Sonika Chandrakant Rathi	568
Student.....	568
Name: K Likhitha(2018H1030069G)	568
PS-II Station: Toshiba Software (India) Pvt. Ltd., Pune	569
Faculty.....	569
Name: Sonika Chandrakant Rathi	569
Student.....	569
Name: Anjana(2018H1030054G)	569
PS-II Station: UBS Business Solutions (India) Pvt. Ltd., - Finance Group, Mumbai.....	570
Faculty.....	570
Name: Bandi Venkata Prasad	570
Student.....	570
Name: D MUKESH REDDY(2016A1PS0697H)	570
Name: KADAM ROHAN RAJESHWAR(2016A5PS0336P).....	571
Name: CHAURASIA AKSHAT(2016B1PS0710H)	572
PS-II Station: UBS Business Solutions (India) Pvt. Ltd., - Group Operations, Pune	573
Faculty.....	573
Name: Bandi Venkata Prasad	573
Student.....	573
Name: AKSHIT GAUR(2016A1PS0882H)	573
Name: Sangam(2016D2PS0990P)	574
PS-II Station: Udaan, Bangalore.....	575
Faculty.....	575

Name: Annapoorna Gopal.....	575
Student.....	575
Name: MANAS BANSAL(2015B2A10783H)	575
Name: VUSIRIKALA VARUN(2016A4PS0304G).....	576
Name: PRACHI SINGH(2016A5PS0752H)	576
Name: Rohit R Nair(2018H1420199P)	577
PS-II Station: UPGRAD, Mumbai.....	579
Faculty.....	579
Name: Swarna Chaudhary.....	579
Student.....	579
Name: DHARAP MIHIR SACHIN(2016A3PS0143P).....	579
PS-II Station: UST Global- Chennai, Chennai.....	580
Faculty.....	580
Name: Sindhu S	580
Student.....	580
Name: S A HARIDHAKSHINI(2015B4A70567H).....	580
PS-II Station: UST Global Infinity Labs-Robotics, Thiruvananthapuram	581
Faculty.....	581
Name: Sindhu S	581
Student.....	581
Name: ANANTHA NISHANTH REDDY(2012B1A80742H)	581
PS-II Station: Visteon Corporation, Pune	582
Faculty.....	582
Name: Srinivas Kota.....	582
Student.....	582
Name: Taranvir Singh Bhullar(2018H1410112G).....	582
Name: P ALLEN THOMAS(2018H1410134H).....	583
Name: Shreesh N(2018H1410200G).....	584
PS-II Station: VMS (Vakil Mehta Seth) Consultants Pvt. Ltd., Mumbai	585
Faculty.....	585
Name: Mahesh K Hamirwasia.....	585
Student.....	585

Name: KONDRAGUNTA RAMAKRISHNA(2018H1430056P).....	585
Name: SUSMITHA RAJENDRAN(2018H1430062P).....	586
PS-II Station: VMware Software India Pvt. Ltd., Bangalore	587
Faculty	587
Name: Chandra Shekar R K.....	587
Student	587
Name: ABHILASH NEOG(2016A7PS0004P)	587
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Name: BHANARKAR SHAUNAK ANIL(2016A7PS0029G)	590
Name: GARVIT JAIN(2016A7PS0080H)	590
Name: VAIBHAV KUMAR TYAGI(2016A7PS0141H)	591
PS-II Station: Vuclip India Pvt. Ltd., Pune	593
Faculty	593
Name: Chetana Anoop Gavankar G	593
Student	593
Name: VIBHOR TAYAL(2016A3PS0154G).....	593
Name: TOTLA YASH VINOD(2016A3PS0181G)	594
Name: VAIBHAV SINGH N RAWAT(2016A4PS0221G).....	595
PS-II Station: Wabco India Pvt. Ltd, Chennai	596
Faculty	596
Name: Venkataraman P.B	596
Student	596
Name: K V AMRITH ASHWIN(2018H1060160H).....	596
Name: JIWANANI GAURAVKUMAR LAXMANDAS(2018H1060178H).....	597
PS-II Station: Walmart Global Technology Services, Bangalore	598
Faculty	598
Name: Vimal S P	598
Student	598
Name: ADHITYA MAMALLAN(2016A7PS0028P)	598
Name: PULISHETTY ROSHINI(2016A7PS0076H)	599
Name: MODIT GOYAL(2016AAPS0413H).....	600
PS-II Station: Western Digital (SANDISK), Bangalore	601

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Name: Preethi N. G	601
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Name: SNEHA SUNDAR(2018H1030037G).....	601
Name: MADHUSMITA OKE(2018H1030194G).....	602
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Name: AYAN SAIKIA(2018H1230252P)	604
Name: B Swetha(2018H1400124G)	605
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Name: RAVI SINGH CHOUDHARY(2018H1400174P).....	608
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Name: Samata Satish Mujumdar	610
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Name: ABINASH SARMA(2018H1060212P)	610
Name: PAVAN KUMAR(2018H1400181P)	611
Name: VIVEK CHATURVEDI(2018H1410151P).....	612
PS-II Station: WickedRide Adventure Ltd., (Bounce), Bangalore	613
Faculty	613
Name: Anjani Srikanth Koka.....	613
Student	613
Name: JOYDEEP NAG(2016A3PS0233P)	613
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Name: Krishnamurthy Bindumadhavan	614
Student	614
Name: PRADHAN PRATYUSH SACHIN(2015B3A30541G)	614
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Faculty	616

Name: Gaurav Nagpal	616
Student	616
Name: SANTOSH KUMAR SHUKLA(2018H1490357P)	616
PS-II Station: Xilinx India Technology Services Pvt. Ltd., Hyderabad	617
Faculty	617
Name: Belde Vinay	617
Student	617
Name: Nayak Jayesh Jagannath(2018H1230158G)	617
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PS-II Station: Zendrive India Pvt. Ltd., Bangalore	620
Faculty	620
Name: H. Viswanathan	620
Student	620
Name: ASHUTOSH GOEL(2015B3A70658P)	620
Name: JAJU VEDANT VINOD(2016A3PS0303H)	621
Name: Aabhaas Vaish(2016A3PS0370P)	622
Name: BUTTE KAUSTUBH PRADEEP(2016A8PS0364G)	623
Name: MAYANK SHARMA(2016A8PS0388G)	624
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PS-II Station: Zeotap India Pvt. Ltd., Bangalore	626
Faculty	626
Name: Raja Vadhana P	626
Student	626
Name: ISHAN GARG(2016A7PS0066G)	626
Name: DEEP CHOWDHURY(2016A7PS0068G)	627
PS-II Station: Zinnov Management Consulting Pvt. Ltd., Gurgaon	628
Faculty	628
Name: Anjani Srikanth Koka	628

PS-II Station: ABB Global Industries and Services Private Limited, Bangalore

Faculty

Name: Srinivas Kota

Student

Name: Anurag Gupta(2018H1400127G)

Student Write-up

Short summary of work done during PS-II: A SNTP server and a SNTP client are both being developed simultaneously for internal testing. SNTP protocol is easier to implement compared to a full NTP implementation but less accurate as well.

Wolfssl has been successfully compiled on Texas Instruments code composer studio and submitted to the manager along with setup and running instructions. WolfSSL is a famous TLS / SSL software solution and it is proven by many worldwide customers. Its quality is robust and the WolfSSL company maintains the security of their product each year.

Tool used (Development tools - H/w, S/w): CODE COMPOSER STUDIO, VISUAL STUDIO, GCC COMPILER, TI SITARA SERIES.

Objectives of the project: Compiling wolfssl on code composer studio and porting to ti sitara series and compiling sntp client application in C.

Major learning outcomes: Writing organization level code and code optimization.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The company environment is good and professional.

Academic courses relevant to the project: Embedded system design.

Name: Anurag Gupta(2018H1400127G)

Student Write-up

Short summary of work done during PS-II: A SNTP server and a SNTP client were both being developed simultaneously for internal testing. SNTP protocol is easier to implement compared to a full NTP implementation but less accurate as well. Wolfssl has been successfully compiled on Texas Instruments code composer studio and submitted to the manager along with setup and running instructions. WolfSSL is a small, portable, embedded SSL / TLS library targeted for use by embedded systems developers. It is an open source implementation of TLS written in the C programming language.

Tool used (Development tools - H/w, S/w): CODE COMPOSER STUDIO, VISUAL STUDIO

Objectives of the project: To compile wolfssl on TI CODE COMPOSER STUDIO and port the developed application to Ti Sitara series. Other objective was to develop a SNTP client application in C for time synchronization.

Major learning outcomes: I learnt about SNTP protocol and its implementation, writing SNTP client code in C. I also worked on wolfssl protocol and learnt about its importance and role in internet security. Learnt how to implement wolfssl application on code composer studio and also learnt about porting wolfssl application to TI sitara series.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is friendly and open for discussion and learning. Enough opportunities were provided. Interactions were informative and got to learn a lot.

Academic courses relevant to the project: NES (NETWORK EMBEDDED SYSTEM) & ESD (EMBEDDED SYSTEM DESIGN).

PS-II Station: Adani Power, Ahmedabad

Faculty

Name: Glynn John

Student

Name: DEEPU DILEEP(2018H1480189H)

Student Write-up

Short summary of work done during PS-II: Project assigned was based on the boiler tube failures. The initial part of the study was to identify and classify failures. This was followed with comprehensive study on water treatment, defect detection etc. New methods for failure detection was suggested.

A CNN model was prepared in python to identify a corroded surface on pipes. It was to relate the new technology suggested with a part of actual implementation of its execution.

Tool used (Development tools - H/w, S/w): Python 3.7, Excel, Word.

Objectives of the project: Identify boiler tube failures, Methods for reduction, Suggesting new technologies.

Major learning outcomes: Got a good knowledge about power plant, boilers, failures. Good experience on implementing deep learning techniques like CNN.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Initially, we were assigned to Ahmadabad station of Adani Power then sent over to UPCL power plant in Udupi. Working environment is nice, except the accommodation facility was not provided.

Academic courses relevant to the project: Academic courses were as such non relevant to the project. I had to learn new technologies like deep learning while undergoing my project.

PS-II Station: Aditya Birla Group -Data and Analytics, Bangalore

Faculty

Name: Pradheep Kumar K

Brief write-up on each PS-II station: Required more knowledge on Artificial Intelligence, Quantum Computing, Augmented and Virtual reality, Blockchain.

Student

Name: ANUJ ANIL PATEL(2016A4PS0222P)

Student Write-up

Short summary of work done during PS-II: The project on which our team is working on is price forecasting of raw materials for TAF, (Thai Acrylic Fibre Co. Ltd (TAF), an Aditya Birla Group Company is a wing of Grasim Textiles, part of the Aditya Birla Group), in order to help the business do procurement planning and help maximize their profit margins. My work specifically is to study the existing code in R, build the pipeline in python and replicate the results, to facilitate python based forecasting platform to be implemented in the coming year (work has already started on this).

The next project was M5 competition on kaggle. In this prestigious competition, its fifth iteration, participants used hierarchical sales data from Walmart, the world's largest company by revenue, to forecast daily sales for the next 28 days. The data covered stores in three US States (California, Texas and Wisconsin) and included item level, department, product categories and store details. In addition, it had explanatory variables such as price, promotions, day of the week and special events. Together, this robust dataset can be used to improve forecasting accuracy.

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

Objectives of the project: Migration of existing price forecasting code from R to Python to enable forecasting as a platform and to participate in the M5 forecasting - Accuracy competition on Kaggle.

Major learning outcomes: How to build a complete pipeline for a project

Exploratory data analysis

Feature engineering

Feature selection techniques

Various basic ML modeling techniques

Lots of pandas

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment is great, everyone is helpful and approachable especially the internship coordinator who is a senior post holder too. Interns are treated almost like employees, projects and data given to them is real confidential ABG data. Every intern is assigned to a team, and given a project under them. It doesn't matter if you don't know anything about it at first, you're given enough time to learn, but then expected to deliver results as well. Willing to give offers as well, to people who show the right attitude for learning and take ownership of their work.

Academic courses relevant to the project: Foundation of data science, Machine learning - Mainly Python and R are used.

PS-II Station: Adobe Systems, Bangalore

Faculty

Name: Vimal S P

Student

Name: KORIPALLI SRI SAI VENKATA RAMA KRISHNA(2015B3A70610H)

Student Write-up

Short summary of work done during PS-II: I was asked to do a POC. Current architecture of the service provided by our team is stateful and have sticky sessions. So there are problems with scalability. They told me to design, implement and test a production ready stateless architecture for the same service using distributed cache and micro services. The advantage of stateless architecture is that the different components in the architecture can be scaled up individually depending on the requirement and there wont be any sticky sessions. They also had stringent conditions on the latency of the service which is why they went for the stateful model in the first place.

Tool used (Development tools - H/w, S/w): Hardware: AWS Elasticache, EC2, SQS
Software: Java for programming. Docker and Kubernetes for deploying. Jmeter to do performance testing.

Objectives of the project : To make the service more freely scalable.

Major learning outcomes: I was able to design and implement a production ready service. It involved a lot of failure scenarios and race conditions due to distributed nature of the service. Handling these scenarios and race conditions while maintaining the stringent latency requirements brought up a whole new level of challenges.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Adobe is known for its work culture. Everyone in the team is very helpful and had helped me when I faced multiple issues while implementing the service. They expect basic coding knowledge of programming language they are working on. (For me it's Java). In my case, they gave me ample amount of time to learn few things before starting the project.

Academic courses relevant to the project : Software engineering and OOP.

Name: VISHNUHOTLA VENKATA KRISHNA HARI VALLABHA(2015B4A70559H)

Student Write-up

Short summary of work done during PS-II: The work given by the team was mainly around the development of a web app. It can be summarized to mainly 3 topics.

- 1) Port tooling features available in the desktop app to web app (PoC).
- 2) Test browser limitations for performance logging like JS Heap limits, Bitmap limits, etc
- 3) Enable caching using browser offline storage APIs and service workers.

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

Objectives of the project: Make web applications as performant as desktop class applications.

Major learning outcomes: Learned how to write production-quality code and knowledge on many new technologies used in the browser environment.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: During the pandemic, the company was financially very strong and onboarded 700 interns across all adobe offices virtually. Interns were constantly engaged with virtual CSR events and summits. They have given extra funds apart from the stipend to set up your work at home. Full-time employment if offered will be announced after 2 months of the end date. The overall experience was great and the only expectation from the intern would be to build great projects which will be showcased at the intern expo at last.

Academic courses relevant to the project: DSA, OOPS, Networking and Software engineering.

PS-II Station: Adobe Systems, Noida

Faculty

Name: Ritu Arora

Student

Name: RISHABH JAIN(2015B5A70550P)

Student Write-up

Short summary of work done during PS-II: I was given the task of improving and extending adobe's current state of the art virtual try on architecture (SieveNet, WACV) through computer vision and deep learning techniques. I was able to significantly improve the performance of their current architecture and the work done will also be used by their product team.

Tool used (Development tools - H/w, S/w): Pytorch, python, github, AWS (amazon web services).

Objectives of the project: The task of image-based virtual try-on takes as input the image of a target model and a query cloth and generates a new try-on output image with the target model wearing the query cloth.

Major learning outcomes: Learnt about world class research in the fields of computer vision. Also got exposure to deep learning frameworks and the ongoing research areas in the field.

Details of papers / patents: Patent 1 - Improved Image-based Virtual Try-on with Interactive Refinement.

Patent 2 - RefineNet: Improved human pose transfer with dynamic content creation.

Patent 3 - Leveraging 3D information for virtual try-on (under preparation).

Paper - Currently und.

Brief description of working environment, expectations from the company: Adobe Noida (MDSR Lab) has a good work life balance with a supportive research team. There are usually no hard deadlines but timely completion of project is expected.

Academic courses relevant to the project: NNFL, Artificial intelligence.

Name: PATEL PARTH(2016A7PS0150P)

Student Write-up

Short summary of work done during PS-II: Worked on latent space based self supervision tasks to improve training of Generative Adversarial Networks (GANs).

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

Objectives of the project: Self supervised learning for steerable latent space in GANs.

Major learning outcomes: Research methodology, Conducting experiments at scale, replicating state-of-the-art, etc.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: Great work culture. Manager and mentors are helpful and motivational. A nice and relatively stress free work environment. Overall, a great experience.

Academic courses relevant to the project: Neural networks & Fuzzy logic.

PS-II Station: AECOM, Mumbai

Faculty

Name: Mahesh K Hamirwasia

Student

Name: MAGDUM SAMMED JINENDRA(2018H1430044H)

Student Write-up

Short summary of work done during PS-II: Design of pile foundation and pier for Mumbai metro line 4. I had to design the sub-structure elements using staad pro. I also had to make a design report for the same. The modeling part was done on staad and analysis results were directly put as an input in Excel. These results were used for designing the reinforcement in Adsec i.e Oasys which gave the moment capacities and load capacities.

Tool used (Development tools - H/w, S/w): Personal computer, STAAD Pro, Excel, Adsec (Oasys).

Objectives of the project: To design pier and pile foundation.

Major learning Outcomes: Designing foundation in soft soils and a new viaduct design.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The seniors guiding here were co-operative and helped at every step. A proper guidance was given for doing the work.

Academic courses relevant to the project: Concrete design, Earthquake engineering.

Name: NAGABANDI SHRAVYA(2018H1430061P)

Student Write-up

Short summary of work done during PS-II: My work involved checking the designs of Underground car parks, Finger Platforms, Crash Barrier, Box culverts, Pump houses. 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. Visiting site once in a month.

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

Objectives of the project: To construct 29 km long freeway that will run along Mumbai's western coastline connecting Marine Lines in the south to Kandivali in the north which comprises of roads over reclamation, bridges and tunnels.

Major learning Outcomes: Understanding the working of Government projects and the various levels of checking 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. PPO will depend on the vacancies in the project and your performance during the internship period.

Academic courses relevant to the project: Concrete design, Steel structures, Earthquake engineering.

Name: SHUBHANKAR SINGH(2018H1430069P)

Student Write-up

Short summary of work done during PS-II: AECOM India Pvt Ltd is a design consultant for the contractor in Mumbai metro Line 4 project. I worked in metro division of company involved in design of sub-structure part of Viaduct of Line 4 of Mumbai metro.

Sub-structure portion designing involved calculation of loads and their combinations acting on structure during the design life and for these loads determining the optimum dimensions and reinforcements required in structure so as to satisfy safety, service ability and economy criteria using codal provisions agree upon by various stakeholders.

This project gave me exposure to real time project that the company is involved, helping me in learning designing of pile, pier and pile cap using combination of softwares like Excel for calculations, STAAD Pro for modeling the structure and ADSEC for getting reinforcement requirements.

This experience also helped me in learning working efficiently in a team under strict deadlines thus helped me in developing professional attributes necessary for career.

Tool used (Development tools - H/w, S/w): Excel for calculations, STAAD Pro for modeling the structure and ADSEC for getting reinforcement requirements and checking crack width.

Objectives of the project: Sub-structure portion designing involved calculation of loads and their combinations acting on structure during the design life and for these loads determining the optimum dimensions and reinforcements required in structure so as to satisfy safety and service.

Major learning outcomes: This project gave me exposure to real time project that the company is involved, helping me in learning designing of pile, pier and pile cap using combination of softwares like Excel for calculations, STAAD Pro for modeling the structure and ADSEC for getting reinforcement requirements.

This experience also helped me in learning working efficiently in a team under strict deadlines thus helped me in developing professional attributes necessary for career.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Company work environment is professional and one is expected to work on targets assigned efficiently within the deadlines assigned. Teamwork is required as work involves collaboration with team members for some aspects. Colleagues are helpful and approachable when facing difficulty. Company expects strong fundamentals in structural engineering and proficiency in softwares like STAAD, ADSEC and EXCEL.

Academic courses relevant to the project: Bridge design, Design of reinforced concrete structures.

PS-II Station: AECOM Infrastructure, Delhi

Faculty

Name: Mahesh K Hamirwasia

Student

Name: ADITYA SINGH(2018H1430065P)

Student Write-up

Short summary of work done during PS-II: I have designed the commercial buildings for the development of port using ETABS and STAAD PRO software as per ACI code recommendations.

Tool used (Development tools - H/w, S/w): ETABS, STADD PRO and MS-EXCEL.

Objectives of the project: To develop the ports for commercial purposes.

Major learning outcomes: Learning and understanding of architectural drawings, modeling of buildings in various software, Calculation of loads applied on buildings, Designing of elements of buildings using codal requirements.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment was very good. I got the opportunity to learn a lots of new things as I have worked in live project. Mentors were very co-operative and always ready to clear doubts. I want to get the chance to work with such kind of company.

Academic courses relevant to the project: Earthquake engineering, Advance structural analysis.

PS-II Station: AFour Technologies, Pune

Faculty

Name: Sonika Chandrakant Rathi

Student

Name: Koustubh Ramakant Phalak(2016A3PS0259H)

Student Write-up

Short summary of work done during PS-II: Marchex is AFour tech's American client, which specializes in speech analytics. Their speech analysis models had already been created at the time I had joined. So, my job was to migrate the tensorflow version of the models to the latest version, and also to run these models on a server. With the help of the onshore team in the US, we had created the models to work on uWSGI server.

Tool used (Development tools - H/w, S/w): Python, VS code, Office laptop.

Objectives of the project: To migrate the Tensorflow version of the models and to run them on a production grade server.

Major learning outcomes: Learnt how a server can be configured, how the logger class inside Python works and how the Tensorflow versions are different.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The Marchex India team had a very relaxed and a positive atmosphere. Each and every member was very convivial and were always helpful to me whenever I needed any kind of help.

Academic courses relevant to the project: Machine learning.

PS-II Station: Agrostar, Pune

Faculty

Name: Anjani Srikanth Koka

Brief write-up on each PS-II station: The below mentioned are the expectations from the industry in common apart from some specific skills in a student. A student can be better prepared by practicing these skills.

1. Exposure to marketing and finance course fundamentals
 2. Data analytics
 3. Proficiency in Excel, Python, R, SQL
 4. Soft skills
-

PS-II Station: AlmaConnect, Gurgaon

Faculty

Name: Gaurav Nagpal

Student

Name: DHRUV CHAUHAN(2016A4PS0371P)

Student Write-up

Short summary of work done during PS-II: The Internship focuses on me being the main person dealing with the job referral program on our platform, the emerging source of revenue of our company. Many things, starting from marketing the program, managing the job posts with their qualitative review, reaching out to the job poster for feedback, referral and reposting, publishing and promoting the post suitably, data extraction and cleansing, and then making decisions on the basis of data analysis. My secondary task is automating the sub-processes involved. I also pitch our product to CXOs for new sales leads, then setting up meetings and subsequent onboarding of new corporate clients. My tertiary task is to hire and manage the work of external interns and handling PR for my company.

Tool used (Development tools - H/w, S/w): Metabase (MongoDB), Amplitude, JIRA, Tableau, SQL, Excel & Google Sheets, Trello, FreshDesk.

Objectives of the project: Management and analytics of the job referral program.

Major learning outcomes: Learnt resource, Time and personnel management, Data analytics and Marketing.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Very friendly, helpful and supportive group of people. The work environment can be classified as collaborative, fun, challenging and rewarding.

Academic courses relevant to the project: None.

PS-II Station: Amazon - Machine Learning, Bangalore

Faculty

Name: Seetha Parameswaran

Student

Name: HITESH SAGTANI(2015B3A70655P)

Student Write-up

Short summary of work done during PS-II: I worked on building and implementing new model for volume forecasting in the wireless category on amazon products. My work involved feature engineering, model interpretation for business teams, building models for the data evolving very frequently and implementing the same.

Tool used (Development tools - H/w, S/w): Pytorch, tensorflow, flask, xgboost, python.

Objectives of the project: Volume forecasting for wireless category.

Major learning outcomes: Learned pytorch, flask and ML concepts.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: A lot of exciting projects are there with the high impact.

Academic courses relevant to the project: ML, Data mining.

Name: ADITI SHARMA(2015B4A70701H)

Student Write-up

Short summary of work done during PS-II: Data exploration, baseline modeling for classification (using logistic regression), architecture design for classification model, classification model implementation (deep learning models with combinations of character and word embeddings, fasttext classification model), baseline establishment for extraction (using US model), architecture design for quantity extraction model, extraction model implementation, integration of classification and extraction models, computation and analysis of results using appropriate metrics.

Tool used (Development tools - H/w, S/w): Pytorch, Jupyter, Pyspark, AWS EC2, Fasttext.

Objectives of the project: The objective of this project is to use information from the IN consumables catalog to compute price per unit (PPU) with high accuracy. This will greatly improve customer experience by enabling the customer to identify the per-unit price of different product.

Major learning outcomes: Understanding business needs, exploring different approaches for the problem, model baselining, cooking (due to covid).

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Lesser interaction with manager and team members when compared to SDE teams, maximum interactions with mentor / buddy; typically an applied scientist intern is expected to dive deep into the project (via research papers, etc.), explore various avenues and deliver on project expectations; no hard deadlines unless one is working on a live project.

Academic courses relevant to the project: Foundations of data science, Machine learning.

Name: PAVAN GUPTA(2018H1030106H)

Student Write-up

Short summary of work done during PS-II: My work involved NLP. Task assigned was named entity recognition. Popular state of the art model was used that is BiLSTM-CNN-CRF. Experiment involved on comparing performance on various types of word embeddings , contextual and non contextual. It involved exploring BERT for transfer learning and using to generate unsupervised embeddings. Experiment were also performed related to stratified sampling.

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

Objectives of the project: Compare performance of various embeddings for the task of NER and using BERT for transfer learning as well.

Major learning outcomes: Finding best setting for task of NER.

Details of papers / patents: Attention is all you need.

Brief description of working environment, expectations from the company: Team was quite helpful. Expectation was to perform experiments properly and draw meaningful insights and avoid any discrepancy.

Academic courses relevant to the project: Machine learning and foundation of data science.

Name: AMAN KUMAR SHARMA(2018H1030137P)

Student Write-up

Short summary of work done during PS-II: I worked on high dimensional time-series forecasting, specifically the time-series related to demand of various products in Amazon's

inventory. The idea was to facilitate movement of products in correct amount well before in advance based on the anticipated demand. The major hurdle that we attempted to cross was solving the issue of cold-start wherein we had no information about products demand history and had to forecast its demand for next 12-25 weeks.

Tool used (Development tools - H/w, S/w): Pytorch, PySpark, MXNet.

Objectives of the project: To forecast demand of products in Amazon's inventory with no prior demand history.

Major learning outcomes: 1. The fundamentals of time-series forecasting both classical (model based) and modern (data driven).
2. The fundamentals of pipelines and workflows involved in productionisation of an ML solution.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment for an applied scientist intern at Amazon is very conducive to the job one is doing i.e Research. In terms of work, Amazon India is solving problems pertaining to our local turf therefore there is a lot of impactful work happening at a great pace. One would get to see what goes behind in customising a truly global company to Indians' needs.

Academic courses relevant to the project: Machine learning, Information retrieval, Data mining (Core and advanced).

PS-II Station: Amazon - Machine Learning, Hyderabad

Faculty

Name: Y V K Ravi Kumar

Student

Name: HARSH JAISWAL(2015B3A30525P)

Student Write-up

Short summary of work done during PS-II: The major project, I did involved finding gender based nuances in employee feedback by leveraging NLP techniques.

Tool used (Development tools - H/w, S/w): Python, nltk, spacy, gensim, tensorflow, keras.

Objectives of the project: Find the terms that cause gender based nuances, find what the review is talking about i.e. the hidden topics in the review, figure out aspects on what a good review actually is and nudge feedback providers in that direction, build a UI to demonstrate the applications and usage.

Major learning outcomes: Natural language processing, Model deployment, Web development.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: You get to own the product and add your insights to the same. Procuring data sets can be challenging and might take a lot of time. You get to decide on the timeline you are comfortable with.

Academic courses relevant to the project: Neural networks and Fuzzy logic, Econometrics, Applied econometrics.



PS-II Station: Amazon - Operations Manager, Bangalore

Faculty

Name: Sandeep Kayastha

Student

Name: SHUBHAM JAIN(2014B5A40633G)

Student Write-up

Short summary of work done during PS-II: I researched on existing Amazon and Indian railway network, to come up with an alternative model of moving shipments by trains. A model was developed for movement to and from DELHI, KOLKATA and MUMBAI, by using inter-city and sub-urban trains. A cost model was developed for Mumbai sub-urban train movement, of which, a pilot run was done by me in February and March, 2020. Efficiency of this movement was increased by bringing about change in the original plan and with the help of Indian railways. I learned about Amazon and Indian railways network and how these can be intertwined for benefit of both. I also learned about cost modeling and the challenges faced while implementing a cost model in real life and how to overcome them.

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

Objectives of the project:

1. Studying the Indian railways network to identify trains.
2. Studying sub-urban network to identify sub-urban trains.
3. Pilot run in Mumbai of sub-urban Trains.
 - a. Set up and performance analysis of Mumbai sub-urban movement.
 - b. Cost modeling of movements

Major learning outcomes: I learned about Amazon and Indian railways network and how these can be intertwined for benefit of both. I also learned about cost modeling and the challenges faced while implementing a cost model in real life and how to overcome them.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: As a part of my curriculum at BITS Pilani, I had a wonderful experience in the form of Practice School (PS2) at the Amazon operations, Bangalore. I joined on 27th Jan, 2020. I worked in non-tech profile as operation manager intern in logistics network. We underwent a 10 day training at warehouses, sort centers and delivery centers of Amazon to better understand the network. After which we were allotted our project. People at amazon are very helpful if you are interested to learn. The best part is that they will only show us a way of solving a problem and will not spoon feed us. We have to try out things, make mistakes and learn. Also, amazon has an excellent work culture as the people are very welcoming, treating the interns as a part of the team like any other employee rather than as outsiders. All in all, Amazon makes a great work place and is a very good place to learn for people who aspire to create their future in operations.

Academic courses relevant to the project: SUPPLY CHAIN MANAGEMENT, PRODUCTION PLANNING AND CONTROL, OPTIMIZATION.

Name: SAHIL RANA(2015B1A40803G)

Student Write-up

Short summary of work done during PS-II: Enabling palletization between sort centers and delivery centers. On analyzing the current condition, I have challenged with five obstacles for enabling palletization. 1. Larger variation of MR vehicle height corresponding to OB dock (+/- 30cms) 2. No frugal dock leveler solution for loading pallets to MR vehicles 3. Adverse impact in MR vehicle utilization due to current pallet size (1.2m X 1.0m) 4. Negative cost impact due to the demand for dedicated vehicle requirements for pallet recirculation between SC – LM 5. Non-availability of ZBS layout for palletizing MR lanes. Using KATA methodology, I have challenged every single obstacle and conducted multiple design experiments to enable pallet movement between SC –LM.

Along with the palletization project, I have also worked on recovering capacities with social distancing (SD) in sort centers by re-designing of the cafeteria, maximizing bagging layout capacity with SD, defining associate deployment in fluid sortation layout to maintain social

distancing. All the above designs have implemented in NCRU, DELU and STVV which resulted in a positive impact on capacities.

Tool used (Development tools - H/w, S/w): Advanced Excel, AutoCAD, Toyota KATA Approach, EasyCargo software.

Objectives of the project: Using improvement KATA approach, define and drive an end to end process for TAT reduction for OB vehicles (for <17 ft. vehicles) by enabling palletized movement between SC to stations.

Major learning outcomes: 1. Understand SC operations, processes and all the factors that contribute to effective OB process. 2. Building a mechanism 3. Toyota Kata practice guide.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: 1. Expect a decent amount of work load (6-7 hours everyday) 2. Highly skilled people with vast knowledge of operations 3. High creative thinking skills are required if the project is related to designing 4. Knowledge of tools for designing such as AutoCAD, Solidworks. 5. Great support provided by mentors and peers.

Academic courses relevant to the project: 1. Engineering Drawing 2. Supply Chain Management 3. Optimization.

Name: SHUBHAM SRIVASTAVA(2015B1A40818H)

Student Write-up

Short summary of work done during PS-II: 1. Creating shipment life-span model, forming damage funnel-flow, detecting critical damage hotspots and providing actionable solutions to have a control over them.

2. Identified top-conceding ASINs in terms of overall returns and overall unsellable. Deep-dived concession reasons and highlighted any outlying trends/metrics for any ASIN/City/FC. Determined potential opportunities for intervention for controlling un-sellable generation and high returns.

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

Objectives of the project: 1. Creating shipment life-span model, forming damage funnel-flow, detecting critical damage hotspots and providing actionable solutions to have a control over them. 2. Identified top-conceding ASINs in terms of overall returns and overall un-sellable.

Major learning outcomes: Personal development:

Decision making from business point of view

Handling on-floor operations

Skills:

Excel

Practical implementation of statistical hypotheses testing – Fisher test

Basic understanding of business report writing

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The company provide flexible working hours, week to week multiple learning modules and frequent interactions with experienced leaders to get knowledge / insights from their experiences.

Academic courses relevant to the project: Mathematics II.

Name: ATISHAY JAIN(2015B1A40848H)

Student Write-up

Short summary of work done during PS-II: Improved the forecasting accuracy in order to improve customer facing metrics.

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

Objectives of the project: To improve a customer facing metric while discovering the underlying problems.

Major learning outcomes: Received an understanding of how forecasting works and an understanding of the bridge between the forecasted values and the on-ground operational issues.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Amazon has a good work culture where there are a lot of growth and learning opportunities. Employees are usually really busy but they take out time to help as much as possible.

Academic courses relevant to the project: Supply chain management, Statistics.

Name: ATISHAY JAIN(2015B1A40848H)

Student Write-up

Short summary of work done during PS-II: Improved customer facing metric called slot availability to improve customer experience.

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

Objectives of the project: Improve slot availability.

Major learning outcomes: Gained an understanding of the nuances involved in forecasting and how they affect the forecasted values. Learnt about various machine learning models already in place which could be used for forecast.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work environment in Amazon helps the student grow and learn. The employees are very busy but they find time to help and guide the intern as much as possible.

Academic courses relevant to the project: Supply chain management, Statistics.

Name: SHIVAM KHANDELWAL(2015B2A10783P)

Student Write-up

Short summary of work done during PS-II: The projects mostly involve - a) Fetching data from Amazon redshift clusters by writing SQL queries b) Development of dashboards using R programming c) Automation of current manpower models using excel solver and VBA d) Automation of generation of weekly business reports.

Tool used (Development tools - H/w, S/w): MySQL, R Programming, Advance excel (VBA, Excel solver etc).

Objectives of the project: Defect reduction & Process improvement for Amazon (Air team).

Major learning outcomes: a) Understanding of Amazon in Air operations b) Technical skills such as data analysis, exploration, automation using tools like R, SQL etc. c) Using optimization methods to solve network planning problems.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: a) Highly skilled people with vast knowledge of operations b) Supportive team members c) Expect good amount of work load (~8 hours/day).

Academic courses relevant to the project: Numerical methods of chemical engineering.

Name: KUSHAV CHOUDHARY(2015B2A30715G)

Student Write-up

Short summary of work done during PS-II: During my PS2 at Amazon as an operations manager, I did two major projects. First was to redesign the delivery bags used in Amazon prime now. We had some major issues with the current design such as bad food non-food segregation mechanism, no adequate space for bar code labels, dark inner color of the bag, bag unable to stand upright i.e. be stable when kept in a trolley for picking order products etc. In order to solve the problems, I performed a cost effectiveness analysis between the reusable bags and the previously used brown bags as a result of which reusable bags came out to be cheaper. I then performed one on one interaction with various on field employees and then came up with solutions with the help of my manager. We introduced three pouches on the inner walls of the bag (back, left and right) instead of the previous rigid mid partition. We also dedicated spaces for bar code scanning labels, changed the inner color to lime yellow for visibility and gave a PVC cardboard support in the lower 25% of the bag to make it stand upright i.e. stable when kept in trolley for picking. I also improved the temperature sustainability of our chilled bags by providing better insulation and reducing the number of gel packs used. This also reduced the overall weight of the chilled bags. As my second project, I created a robust quality and social distancing audit mechanism for Prime now that helps the central team to identify process misses, compliance gaps and other improvement opportunities. I also created an automated tool using python language of programming (pandas library) to automate the audit report generation process. This tool reduced the time required for report generation from 7-8 hours / week to 15-20 minutes / week.

Tool used (Development tools - H/w, S/w): Jupyter Notebook (Python and Pandas), Excel and other internal Amazon tools.

Objectives of the project: The objective of redesigning reusable bags project was to a comprehensive analysis of cost difference of paper bags vs reusable bags and to identify gaps in the current design of reusable bags and come up with a better design to resolve all these issues.

Major learning outcomes: Negotiation skills, Excel, Document writing in Amazon, Python language of programming (Pandas library), Cost effectiveness analysis, Designing of products, Automation of mechanical activities and Amazon's leadership principles.

Details of papers / patents: My patent for the bag redesigning project consists of the introduction of three pockets in the back, left and right inner sides of the bag instead of the mid partition, dedicated spaces for bar scanner labels, introduction of PVC cardboard at the bottom.

Brief description of working environment, expectations from the company: The working environment in Amazon is great. Some of the key highlights from employees point of view are work hours flexibility and dressing flexibility. Amazon corporate offices are greatly built and has some great facilities for the employees. Other than this, the most unique part of Amazon's work culture is its 14 leadership principles defined by Jeff Bezos. It is fun to see how all Amazonians live by these 14 principles on every action we perform. When it comes to the expectations from the company, Amazon expects us to firstly follow these 14 leadership principles by all means and then perform our projects efficiently. Amazon promises to be the most customer-centric company ever and hence we start with our customers, with customer satisfaction and move backwards. We in Amazon are a family and are consider each and every problem as our own.

Academic courses relevant to the project: Principles of managements, Optimization, Computer programming, Object oriented programming and Technical report writing.

Name: NIKHIL JUNNARKAR(2015B5A40608G)

Student Write-up

Short summary of work done during PS-II: 1.Ideal building costing and sizing (FC)

Currently, we have fulfillment centers (FC) which support the customer demand and we are continuously in the process of launching new FCs. The task is to find the size building which is most cost-efficient for the 2 h delivery model. We have updated the design principles that determine the right building sizes. The result is the size of a building that would minimize the cost per unit and at the same time be feasible to be launched in the city regions. This building plan has evolved over the former model, identifying all the involved costs. The work also focuses on how the cost change with the size of the building.

2.Rate Model - Business requirement sheets (BRS) provide detailed information about all the design aspects of a specific building. They take in outbound volume as input and provide all the 4Ms / Manpower / Shelving as cube etc. as an output. The current sheets are static and only portray the requirements of an FC for a given outbound volume. The idea is to develop a dynamic rate model using excel that would give all the elements and cost structure to make the FCs, depending on the Output and productivity.

3.Ideal Building Costing and Sizing (LPC) - There are two types of buildings in the UFF business- FC and Hub / Live Processing centers (LPC). Taking cues from the methodology adopted for FCs, we have extended the model to Hub/LPCs. They are storage centers that are present one leg before the Fresh FCs. They also act as the processing centers for perishables (atta, ice creams), and fresh produce (fruits & vegetables) including the tasks of grading, scaling, etc.

Tool used (Development tools - H/w, S/w): MS Excel, Amazon LMM tool, Amazon PlayBook.

Objectives of the project: The project covered three major deliverable that - 1.To arrive at the right sizing of buildings and then perform costing and topology analysis for a) Fulfillment Centers b)Hub / Live processing centers (LPC) 2.To design a rate model of building specifications.

Major learning outcomes: Supply chain management, Project management, Labor modelling, Cost analysis and Topology analysis.

Details of papers / patents: Confidential to Amazon.

Brief description of working environment, expectations from the company: As a part of the curriculum at BITS Pilani, I had a delightful experience in the form of Practice school (PS2) at the Amazon Operations, Bangalore. I worked in the non-tech profile as an Operations manager intern in the supply chain execution team. We underwent a 10 day training at warehouses, sort centers and delivery centers of Amazon to understand the core fundamentals of the processes. After this, I performed the learning by doing, to get on ground training of GSF (Special Fulfillment) training. This lasted for almost 3 weeks and got hands on experience of handling a shift. People at Amazon are helpful and friendly. They would always help us approach the problem instead of giving direct solutions. They also make sure to understand the business context of things. I tried out things, made mistakes and learned in the process. Amazon has an inclusive work culture as the people are welcoming. Our work is valued and interns are considered as a part of the team like any other employee. All in all, Amazon makes a great work place and is the place for people who aspire to create their future in Operations.

Academic courses relevant to the project: Production planning and control, Operations management, Supply chain management.

Name: AVINASH BIJU(2016A1PS0512G)

Student Write-up

Short summary of work done during PS-II: I worked on reconciliation of c-returns as well as reusable assets used for prime now (ultra fast) delivery. Reconciliation involved putting into actions mechanisms to record, monitor and report data at a determined frequency so that senior management can access said data for getting an update on the status of assets available on field. This was achieved through data collection and DBMS tools (for e.g. SharePoint).

The other half of my project was on reconciliation of returned/rejected orders. This process involves a number of scans to log to flow of assets through the return verification procedure. I had to investigate cases where process was not being followed and perform a root cause analysis for the same.

Tool used (Development tools - H/w, S/w): SharePoint Server 2016, Quip.

Objectives of the project: Loss reduction in operations.

Major learning outcomes: Management and leadership principles, Standard understanding of operations, etc.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The environment is very work-intensive and the standard is set high, with big deliverables in a short span of time. It provides a lot of opportunity for understanding supply-chain, operations and other related subjects on a practical basis.

Academic courses relevant to the project: NA.

Name: Vidhi Shah(2016A3PS0169P)

Student Write-up

Short summary of work done during PS-II: Excel modeling to predict warehouse operations given a particular hourly volume, capacity, and manpower. Conversion of model to web-based tool using Python.

Tool used (Development tools - H/w, S/w): Python (Dash framework), Excel (VBA).

Objectives of the project: To create a model that predicts operational risks for contingency planning.

Major learning outcomes: Overall: Warehouse Operations, De-bottlenecking, Prediction Models

Software: Python, Excel VBA.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working from home (post the pandemic): regular meetings with team to share progress and expectations.

Academic courses relevant to the project: Supply chain management.

Name: Vidhi Shah(2016A3PS0169P)

Student Write-up

Short summary of work done during PS-II: Created multiple site capacity models to predict operational risks and provide early warning signals. Models created for pre- and post-lockdown conditions as well as peak and non-peak conditions. Also developed a model to predict exact time of completion of processing to compare with deadline.

Tool used (Development tools - H/w, S/w): Used Excel for model creation (VBA), Python (with Dash framework).

Objectives of the project: To enable quick de-bottlenecking of site constraints across the Indian Amazon warehouse network.

Major learning outcomes: Learnt how warehouse functions are interlinked and the exact path a package goes through before it reaches the end-user, learnt capacity modeling and risk prediction using historical data, learnt importance of creating easy to use tools, greatly improved Excel skills.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Support was provided by my team throughout the internship, immediate query resolution greatly improved the experience.

Academic courses relevant to the project: Supply chain management.

Name: RAUNAK JALAN(2016A4PS0134G)

Student Write-up

Short summary of work done during PS-II: Two projects were allotted to me during PS, Project 1:- Improvising ZBS (Zonal Based Sortation) in the staging area Project 2:- Analyze forward leg node controllable impact due to fluid and bag miss-staging.

The first project involved in finding an alternative to the RF scanner which could be used to enhance the scan rate and then discussing about the viability of it with my mentor and manager. But, the results didn't come as it was expected to be due to the 1D nature of the scanner. So, after this, a new proposal for the procurement of 2D ring scanner is put forward. Next, from the analysis of the load pattern, a new layout was designed for staging purposes of shipments of different locations, but the implementation has been halted due to the prevailing COVID-19 situation to check for the results.

The second project involved in extracting the data from various portals and then analyzing it to find the impact of NC misses due to fluid and bag miss-staging. After analyzing the data, some design of experiments were proposed which has been implemented at the site. On collecting the data after implementation, the results showed a significant decrease in the miss-staging of the shipments.

Tool used (Development tools - H/w, S/w): MS Word, MS Excel, MS PowerPoint, Microsoft Outlook, Advanced Excel, VBA, MySQL Workbench, Amazon trans logistics tools.

Objectives of the project: Project 1 - Improvising ZBS (Zonal Based Sortation) in the staging area - Increase the scan rate in the ZBS layout from 4 scans / min to 10 scans / min by identifying the blockades and implementing new ways to enhance the scan rate and to further analyze the same.

Major learning outcomes: Both the projects assigned to me helped in improving the performance of the site where I worked as in it attributed in increasing the scan rate of the

shipments which resulted in a better productivity of the site and the new layout designed for the staging purpose will result in lesser in-facility losses of the shipments and proper staging as the shipments will be stacked in a pallet according to their locations with proper wrapping around them to avoid any falling. Also, the experiments done for the second project helped in reducing the misses at the site due to miss-staging which was one of the major blockers in the improvement of the performance of the site.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: It was a great experience working with Amazon for 5 months. The company gave me immense opportunities to work upon my soft skills alongside technical and management skills. I was exposed to a variety of situations and had ample opportunity to scale up my leadership and decision making abilities. This has helped me become an effective people manager and improved my communication abilities. Also, the projects were quite challenging in nature and it would have not been completed within the prescribed time without the constant help and guidance from my mentor, manager and other operations managers. All of them were very supportive and helped in clearing every doubts that I had. The student-to-working professional transition could not have been smoother and I'm privileged enough to explore the depths of my project while at the same time gaining useful insights into Amazon's business in India. Overall, it has been a very pleasant and smooth experience interning at AMAZON.

Academic courses relevant to the project: Yes, Supply chain management and production planning control helped me in the projects.

Name: ASHUTOSH KUMAR GUPTA(2016A4PS0214G)

Student Write-up

Short summary of work done during PS-II: The project was structured with 4 phases of analysing the current situation, development of a system, pilot run and large scale deployment

of the system to drive changes. I was able to launch a new project for capturing truck turnaround time and benchmark the future goal with the help of historical data captured. Other solutions could not implemented due to current Covid19 situation but the analysis and the solutions were proposed to the higher managers.

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

Objectives of the project: Arrive at avenues to improve the transshipment efficiencies – cost and accuracy.

Major learning outcomes: Maynard Operation Sequence Operations (MOST) process.
Cost vs. Benefit analysis, Root cause analysis.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Brief description of working environment and expectations – The Amazon believes in higher standards and developing the best. I feel proud that my institute has provided me the opportunity to work here through PS2 system. I got ample support from all corners in this organization from time to time. The work can be hectic and even no work is also possible as Amazon is a fast paced organization but the most valuable lesson learnt is ownership culture. I was expected to analyse current situation, develop a new system and drive the improvements which I have fairly tried to accomplish. Some developments were blocked due to Covid19 situation where only AS-IS analysis is presented.

Academic courses relevant to the project: Supply chain management & Optimization.

Name: UTKARSH MAHAJAN(2016A4PS0299G)

Student Write-up

Short summary of work done during PS-II: The project involved cost reduction measures in the Amazon India heavy and bulky network. The network is made up of 3p operated delivery stations with high station costs. My project was to divert small shipment volumes to Amazon owned stations to optimize productivity for Amazon owned stations and to derive greater cost benefits from a renegotiated rate card structure.

My second project involved development on a new rate card based on 2019 sales data and 2020 - 23 projected volumes for different categories of products.

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

Objectives of the project: Cost reduction by developing alternate fulfillment method for small shipments.

Major learning outcomes: Cost analysis, Data analysis, Stakeholder alignment.

Details of papers / patents: 2 papers written based on pilot project and rate card development.

Brief description of working environment, expectations from the company: The working environment is extremely friendly and supportive. Amazon does not spoon feed or micromanage you and pushes you to come up with solutions to your own problems. The challenges are exciting and a lot of learning opportunities are present.

Academic courses relevant to the project: Probability and statistics.

Name: Piyush Mishra(2016A4PS0301P)

Student Write-up

Short summary of work done during PS-II: This project is for the Prime Now inventories where the shelving is what defines the capacity. This is determined by the volume of products and the storage of these in various types of bins in the shelves. The ask in this project is to look at avenues of improving the current shelving design to incorporate more stock which is needed

while making a spoke in line with the demand requirements of the site and also evaluate what results in poor utilization of shelves currently (under-utilization in some and over utilization in others) and arrive at right mechanism of monitoring the same.

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

Objectives of the project: Arriving at a right slotting mix to improve the capacity of sites; Help in designing new site for Amazon.

Major learning outcomes: Working in corporate world.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Amazon works at a very fast pace. The time for implementing major projects right from conceptualization is just a matter of few months. Moreover, there is no difference between permanent employees and interns. We are given as much respect as anyone else on the team. This made me feel important. Despite this, I never felt stressed out as every one is very supportive and are always ready to hold our hands if necessary.

Academic courses relevant to the project: Supply chain management.

Name: MAHIMA VARWANDKAR(2016A5PS0727H)

Student Write-up

Short summary of work done during PS-II: As an operations manager intern in Amazon's Sort centre (BLRH) in Bangalore, I had multiple responsibilities to hold on. The work ranged from handling on floor operations to data analysis of the datapoints of various process paths of the site. And, hence improving the current mechanisms to increase the productivity of the site.

Tool used (Development tools - H/w, S/w): Around 10 amazon specific tools, SQL, Advanced Excel.

Objectives of the project: The objective of the projects was to increase the overall performance of the site by increasing Autosorter's efficiency and reducing FL NC misses.

Major learning outcomes: Learnt people management, creative thinking, design thinking, problem solving, MySql, Excel VBA, Presentation skills.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Amazon insists on working at high standard. The interns are needed to show bias for action, curiosity, deep dive, ownership. The environment is super friendly. Everyone in the company is more than happy to offer help and guidance.

Academic courses relevant to the project: Supply chain management, Strategic management.

Name: ANANT AGARWAL(2016ABPS0641H)

Student Write-up

Short summary of work done during PS-II: My project was to improve pick productivity of the warehouse through consolidation strategy i.e. to increase picking rates from the inventory to pack stations by moving fast moving units near packing lines. Moreover, I was also looking on floor management during my complete internship focusing on deployment of associates into various functions within department and to track there idle time and rates. And also working on reducing the amnesty addback which was created in huge numbers all over the building.

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

Objectives of the project: To increase pick productivity to 110% of benchmarking document

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

Details of papers / patents: Amazon confidential.

Brief description of working environment, expectations from the company: As an Area manager Intern you generally have a team of undergraduates from lower ranked colleges working under you and you may be managing a team of over 100+ associates, problem solvers and process assistants. The first month is spent understanding the technicalities of work and learning by doing tasks yourself. The team is generally supportive, however expectations in terms of work load will vary depending on the site.

Academic courses relevant to the project: Manufacturing management, Lean manufacturing, Supply chain management.

PS-II Station: Amazon - Operations Manager, Delhi

Faculty

Name: Sandeep Kayastha

Student

Name: KETAN PALIWAL(2015B2A40720G)

Student Write-up

Short summary of work done during PS-II: I worked on losses metrics to get the potential reasons behind the losses. Then I worked on new tool and gave suggestions to improve

effectiveness of tool. And proposed a mechanism to improve orphan recovery which is finally resulted in reduction in losses.

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

Objectives of the project: Reduce In-facility losses.

Major learning outcomes: Excel, Operation management.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: As a part of my curriculum at BITS Pilani, I got a wonderful industry experience in form of Practice school (PS2) at the Amazon India. I worked in non-tech profile as operation manager intern in logistics network. The on-boarding was very smooth and all instruction was sent very before the start of internship. we all have gone through the all network of amazon logistics in our initial days to understand the functioning of E-commerce division. After that we have been allotted a particular location and have got our project details on first day itself. Peoples are there very helpful if you are interested to learn. You have to be curious about new learning. Also, amazon has an excellent work culture as the people are very welcoming, treating the interns as a part of the team like any other employee rather than as outsiders. There is also good chances of getting final offer if you have done your work properly. All in all, Amazon makes a great work place and is a very good place to learn for people who aspire to create their future in operations.

Academic courses relevant to the project: Production planning & control, Supply chain management.

PS-II Station: Amazon - Operations Manager, Hyderabad

Faculty

Name: Sandeep Kayastha

Student

Name: ASWIN N(2016A1PS0465G)

Student Write-up

Short summary of work done during PS-II: In my tenure, I was given two projects. One is to reduce in facility ageing (losses). The aim was to connect all the packages coming to my facility to next one within a desired time. If any packages dwell more than desired time it will add to the ageing. This happens due to variety of reasons including bag level receive, damage, inner content miss etc. The goal is to eliminate these causes to get as much as ageing as we can. Here escalation mails were sent to previous node for bag level missing packages. For damage shipments a dedicated saver spider was deployed at inbound and mobile PS carts were deployed to reduce dwelling of shipments.

The second project was to reduce the RL NC CPT misses. Critical Pull Time (CPT) Node controllable (NC) misses refers to those shipments which failed to leave the facility within stipulated time due to reasons which were controllable by the operations department of the facility. This ultimately leads to unsatisfied customer as it will not reach customer in time. This is due to reasons like miss-staging, delayed bagging, damage, miss-sort etc. The aim is to flush all the packages within CPT and save the customer promise. So new process paths for small shipments were created to not lose the shipments in the facility. A new process is created for miss-staged shipments to increase visibility and guidelines sheet were made for missing different scans.

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

Objectives of the project: Reduce In facility ageing, Reduce RL NC CPT misses.

Major learning outcomes: In-depth understanding of amazon middle mile logistics, improved excel skills, deep understanding of amazon internal tools, learned to co-manage a shift with 150 associates.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Since it is a field job, we are expected to work on the floor of the ware house around 10 hrs per day with 1 hour break timing. There is no strict in and out time. Most of the warehouses are situated in outskirts of city limits and many offer home office pickup services. Every safety measure is taken care by the company in international standards and no worries in that aspect. 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: Principles of management, Supply chain management.

PS-II Station: Amazon - Operations Manager, Mumbai

Faculty

Name: Sandeep Kayastha

Student

Name: HARSHOMAN SINHA(2016A2PS0830P)

Student Write-up

Short summary of work done during PS-II: I worked as an area manager at BOM6, an Amazon receive center in Mumbai that receives an average of 2,00,000 units from vendor shipments daily. I was tasked with managing shifts at the warehouse: achieving adequate throughput, while monitoring productivity and quality.

I also worked on several projects during my internship that improved inventory stowing rates at warehouses, identified and eliminated bottlenecks in BOM6, and drove the adoption of eco-friendly, reusable containers across the network.

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

Objectives of the project: 1. Process improvement at bottlenecks 2. Improving productivity at downstream FCs 3. Reducing the consumption of single-use corrugated boxes in the FC.

Major learning outcomes: Labor management, Operations management, productivity and quality improvement, exposure to e-commerce value chain.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: As an area manager Intern, you'll be directly managing a team of over 100+ Associates. The leadership team will usually be quite cooperative and supportive. There is a lot of accountability, and interns are treated as full time employees right from day 1. Work load might vary depending on the fulfillment center. On a daily basis, your work might not be very intellectually stimulating; it will have more to do with running warehouse shifts and managing labor resources effectively. However, multiple project opportunities exist that offer a good learning curve. Since, this is an operations role, interns (and full time managers) spend almost all their time on the warehouse floor, directly engaging with the associates and monitoring the process line. Process improvement is an important aspect of daily responsibilities.

Academic courses relevant to the project: Lean manufacturing, Production planning and Control could be useful.

Name: Ajinkya Vyas(2016A3PS0246P)

Student Write-up

Short summary of work done during PS-II: I worked as an area manager intern at BOM7. Major task was to handle a shift with 120+ associates and to get the required volume processed with safety, quality and productivity. Along with shift handling I was tasked to work on a project to improve the throughput by reducing the idle time of pickers. All the decisions made are based on extensive data analysis. So, it would be beneficial if you are hands on with advanced Excel and VBA.

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

Objectives of the project: 1. Pick productivity improvement 2. Root cause analysis on all the problems leading to idle time 3. Sustenance plan.

Major learning outcomes: Manpower planning; Macros for excel.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Area manager interns are not treated as interns, Amazon considers you as a full time employee and invests a lot of time into providing you with resources for your learning. On a daily basis AM are required to run shift along with focusing on process improvements. You would be required on floor constantly as many problems require immediate attention. Work can become hectic at times but there is a lot to learn as ample amount of responsibility and freedom is given to the intern to make process changes.

Academic courses relevant to the project: NA.

Name: KUMAR UTKARSH(2016A4PS0325H)

Student Write-up

Short summary of work done during PS-II: First couple of months were spent learning the basics of the work done in a fulfillment center, what work is done and how it's done. After getting a feel of that, started focusing on preparing for running a shift in the FC, since that would be the next major step and would very much be the basis of conversion to a full time employee. But, then corona hit, interns were asked to work from home so i started focusing on my project. Started going to the FC in the last month of the internship after a 2 week pause, and learnt a lot about the delicacies of the system in place.

Tool used (Development tools - H/w, S/w): Used VBA for excel to develop a tool for my project.

Objectives of the project: To create a tool which would assist a process assistant in the picking process, by collecting and displaying data from various portals at one place.

Major learning outcomes: Learnt VBA during the pause. Learnt people skills since most of the job was interacting with various stakeholders to get the job done.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The environment was very work oriented, as expected. Still very welcoming and motivating. Being a part of a team fulfilling tens of thousands of customer orders per day was truly thrilling, and that is what drove everybody. The company holds its leadership principles in high regards, and these are quoted constantly throughout a day. The company is, as you would expect, filled with skilled and talented individuals and a surprisingly high number of engineers.

Academic courses relevant to the project: Some of the courses like supply chain management were particularly helpful.

Name: DEORE KETAN RAVINDRASINGH(2016A4PS0444P)

Student Write-up

Short summary of work done during PS-II: My project was to improve pack productivity by reducing 1) Idle time 2) Flow cycle time 3) Defects. for that, had to analyze the process, understand the intricacies, and identify best practices in other sites, and implement the best possible strategies.

For reducing the idle time- optimal deployment of packers, use of shift management tools, increment of units in a cart, so that the cart changeover time reduces, daily report for idle time defaulters, was implemented.

For reducing the pack kickout FPY, all the stations' weighing scales were calibrated, associates were coached on handling boxes greater than the area of the scale, and, a vibrating mode was enables on the scanners so that they do not have to check the screens if the barcode is scanned or not.

For reducing the pack cycle time, the best standard process for packing comparing from all the warehouses was implemented, minor changes in the pack station layout was done, and deployment of associates in the specific type of packing in which they excel was done, a kaizen was made for specific box type.

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

Objectives of the project: IMPROVING PRODUCTIVITY OF PACK PROCESS BY REDUCTION OF PACK CYCLE TIME AND REDUCTION OF UNKNOWN IDLE TIME AND REDUCING SLAM PACK KO FPY.

Major learning outcomes: Professional etiquettes, using Excel, people management.

Details of papers / patents: There were no patents made.

Brief description of working environment, expectations from the company: You are almost equivalent as an employee, it is stated by the students programs team that you are to handle the project only, but on the site, a lot of time you are need to set aside from your project work and do handle the actual shifts.

Academic courses relevant to the project: Lean manufacturing, QCAR, PPC, SCM.

Name: PATHAK TEJAS VIJAY(2016A8PS0729G)

Student Write-up

Short summary of work done during PS-II: As an Outbound (OB) Area Manager Intern, the work involved shift handling on a daily basis & implementation of projects to optimize the cost behind every shipment the Fulfillment Centre (FC) services. I was assigned to three different projects in the course of my internship. The first one involved planning for the implementation of SLAP (a variety of Pack stations) stations in the FC. This project involved communication with various stakeholders, redrawing of the FC layout, seeking approvals from senior leadership & cost analysis. The second project involved improving an internal metric of the FC: favorable pick percentage. This project also involved coordination with stakeholders from different teams, daily analysis of picking data & driving new initiatives on the floor to increase the metric.

The third project was to reduce 'time at bin' & 'time between bins' to enhance pick productivity and hence decrease the cost per shipment. Extraction of data from Amazon's platform, analysis, identifying defaulting associates & getting the coaching done were the main efforts taken for this project.

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

Objectives of the project: Cost optimization in fulfillment centre.

Major learning outcomes: 1) Improvement in written & verbal communication

2) Advanced and extensive use of Excel

3) Proficiency in SQL Oracle query

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The work environment in Amazon is very demanding. High quality of performance is expected consistently.

Academic courses relevant to the project: NA.

Name: PATIL RITURAJ MAHENDRA(2016ABPS0583P)

Student Write-up

Short summary of work done during PS-II: Worked as an area manager where you have to manage more than 50 people working for you. Developed many mechanisms to achieve Amazon's internal metrics. It was a great working experience and I learned a lot about approaching various problems and actual implementation on the floor. I have taken the responsibility of handling the shift which includes morning labor management, flow meetings per shift and gemba walk. The lean principle of continuous improvement is one of the pillars of my work. Having done a lot of analytics work in the past two months, I have got a good exposure to what sort of data is utilized in e-commerce industries, how is it processed and how are analytics tools leveraged to find solutions. My projects has a lot of associate coaching involved and setting the culture for them. The impact of such projects will help Amazon during the peak when the work is much larger and managers cannot pay attention to every small detail. By the end of the internship you would be capable enough to handle the complete shift for your department.

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

Objectives of the project: Improving the overall productivity of the warehouse, segregation of items for effective storing, Coaching associates to improve accuracy of their work.

Major learning outcomes: Managing people, Amazon's leadership principles, Root cause analysis, Lean manufacturing.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Company expects a lot from the interns. Come up with new innovative but simple ideas. Learn everything about your department and start giving results as soon as possible.

Academic courses relevant to the project : Lean manufacturing, Supply chain management.

PS-II Station: Amazon Area Manager, Bangalore

Faculty

Name: Sandeep Kayastha

Student

Name: PIYUSH SHARMA(2016A1PS0547H)

Student Write-up

Short summary of work done during PS-II: Worked on Six Sigma – DMAIC process improvement methodology and time series forecasting. Web scraping using Python and VBA is performed and ARMA model used for forecasting.

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

Objectives of the project: Reducing Pre Slam DEA Miss and Forecasting volume, SML mix and Space creation mechanism for the same.

Major learning outcomes: Six Sigma DMAIC process improvement, Time series forecasting using ARMA model and Operations management.

Details of papers / patents: No.

Brief description of working environment, expectations from the company: Very collaborative and friendly. People are very smart and approachable. All expectations met.

Academic courses relevant to the project: No.

Name: PANKAJ KUMAR(2016A1PS0704G)

Student Write-up

Short summary of work done during PS-II: My primary work in the PS 2 was to look after the daily working in the warehouse and learn to run the shift. The other work of mine was to reduce the delivery estimated accuracy mis-happening due to our department from 120 per week to 50 per week.

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

Objectives of the project: Reduce the DEA miss.

Major learning outcomes: The main learning requirement of this whole experience was how the world of E-commerce actually works and how an order is fulfilled after you order something from the Amazon website. The other advantage of working here is learning how to work in a team as every work in the organization is dependent on one another so there need to be great collaboration.

Details of papers / patents: No paper published.

Brief description of working environment, expectations from the company: The general working environment in the company is excellent and the entire working culture is healthy. Expectations are there from you to learn quickly about the workings of the FC and the company expect you to start running the shift before you leave from here.

Academic courses relevant to the project: Supply chain management.

Name: PRANAV MANOJ AGARWAL(2016A3PS0165G)

Student Write-up

Short summary of work done during PS-II: The primary focus of the project was to maintain quality standards and improve the health of the inventory. This included not only reducing defects, but also rearranging the inventory to optimize the use of space through a process known as consolidation. Some of the project parts were proactive, wherein the stowing process was examined and there were changes made in the processes and behavior of the employees to ensure defects were not introduced in the first place. However, some parts are reactive, where the existing stowed inventory was looked at and problems and inefficiencies are identified and rectified. There were also many macros created and web scraping done using VBA from internal Amazon portals to help collect and analyze data to identify defects and improve processes.

Tool used (Development tools - H/w, S/w): Excel, VBA and many internal Amazon portals and trackers.

Objectives of the project: Inventory management and Stow Quality Control.

Major learning outcomes: People Management, VBA And Excel, Data Analysis.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: As an area manager intern, you are expected to assist your department's operation manager with the daily functioning of that department during the shift. You will also be assigned a project to work upon to improve processes at the warehouse.

Academic courses relevant to the project : Not relevant to my branch.

Name: ADITCHANDRA(2016A3PS0256P)

Student Write-up

Short summary of work done during PS-II: frX compliance is a key metric related to customer experience and DEA misses keep track of customer experience. I was able to improve the average frX compliance score by 25% and minimized DEA misses by more than 52%.

Tool used (Development tools - H/w, S/w): Various Amazon portals, Excel.

Objectives of the project: Improvisation of frX compliance score and minimisation of DEA misses.

Major learning outcomes: I found running shifts highly insightful as it enabled me to understand my projects better. Additional to the allotted projects, I was able to take up a couple of ad-hoc projects through which I explored other aspects of the value chain as well. In short, the internship provides solid experience in people management, data analysis as my project needed it and a better understanding of the Amazon supply chain.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: This is highly dependent on the team you are assigned to. I was fortunate to work with a really friendly group, who treated me as a fellow AM rather than an intern and I believe that opened up a lot of opportunities for myself. Amazon is very data-driven and they expect their employees to deliver results backed by a thorough analysis.

Academic courses relevant to the project: Supply chain management.

Name: JOGDAND RUSHIKESH RAMKISAN(2016A4PS0147G)

Student Write-up

Short summary of work done during PS-II: At Amazon FC (warehouse), damage generation and amnesty generation are two critical indicators of quality. Items that are accepted at the FC and get damaged before shipping are termed as warehouse damage. Warehouse damage costs the FC in terms of seller reimbursements. It also affects ability of FC in delivering the customer order within promised time. At the FC, the products are kept in shelves in small units called bins. A bin had physical inventory and a virtual record of it. When a customer places order, it gets attached to products in specific bin, and only that bin can be used to fulfill it. Hence, it is critically important that physical items and virtual records agree all the time. A source of mismatch in these is when a product falls down from a bin. This is called an amnesty item. Amnesty costs the FC in terms of manpower allocated to rectify the mismatch, risk to customer promise and possibility of product getting damaged due to the impact. In this project, I analysed various processes in FC involving inventory movement. From this, I found out 1 structural improvement, 1 process fail points, 1 improvement area for human errors. For the process fail point, I recommended a tool modification, which has potential to reduce 25% of warehouse damage. From the improvement process of human errors, we are seeing ~30% decrease in WD in that process. Also, I planned 1 structural improvement to reduce amnesty which would be acted upon in near future.

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

Objectives of the project: Warehouse damage reduction, Amnesty reduction.

Major learning outcomes: Managed to get domain knowledge in following areas - Shift Management, Process analysis, Structural improvement implementation planning, Tool designing.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: This is a field job. There is a lot of physical movement involved. The company trusts your ability to take right

decisions. However, the decisions are expected to have a clear thought process behind them. The company expects you to take inspiration from the famous 14 leadership principles (<https://www.amazon.jobs/en/principles>) as starting point.

Academic courses relevant to the project: Supply chain management, Machine design.

Name: RAHUL T(2016ABPS0919P)

Student Write-up

Short summary of work done during PS-II: Outbound processes can be broadly classified into Pick, Rebin, Pack and Ship. Defects that occur within each of these process lead to decrease in efficiency and at times can put customer promised delivery date at risk. Reduction in damages that occur while processing a shipment can save costs incurred to Amazon. The main objective of the project is to come up with viable solutions that can reduce the chances of defects by associates. The various barriers faced by the top DPMO defaulters will be addressed. The initial steps of the project was to analyze past DPMO data to identify trends pointing towards a root cause. The root causes can then be eliminated by technological and design modifications. The recommended changes and monitoring of focus areas started by last week of April post which the results were analyzed. Shift management and associate training were the daily tasks.

Tool used (Development tools - H/w, S/w): SQL, ATLAS-KIBANA, AutoCAD.

Objectives of the project: To find out opportunity for the OB FPY reduction in: (a) Pick wrong scan (b) Pack slam kickout (c) Pick short (d) Pack slam wrong box (e) Pack item damaged & (f) Sort error indicator on correction of manual error encountered on shop floor from existing.

Major learning outcomes: Shift management maintaining compliance, Defect analysis, Man power management, Familiarity with warehouse management systems.

Details of papers / patent: None.

Brief description of working environment, expectations from the company: The work location is the Amazon fulfillment center where the inventory is in-bounded and processed as per customer order. It is a shop floor job that requires a lot of movement between the various stations within the FC. The daily tasks involve shift management and manpower allocation to process the daily capacity.

Expectations from the company is to make sure the daily customer shipments required to ship out are done within the stipulated time. The shift should run with minimum defects and maximum output with the given manpower. Any defaulters should be coached and their further rates should be monitored.

Academic courses relevant to the project: Supply chain management, Machine design and drawing.

PS-II Station: Amazon Development Center, Bangalore

Faculty

Name: H. Viswanathan

Brief write-up on each PS-II station: Software industry is being transformed by two waves - first one with respect to the development and usage of software applications for the emerging fields like AI, ML, IoT and Analytics. Second one with respect to the manner in which software development and associated activities are carried out - to name it like full stack engineering. If the students are introduced with the new edge, complex software systems architectures along with the technology / platforms that helps in building such complex products, that will make them more industry ready or otherwise they need to spend a lot of time in understanding these complexities involved and are left with very less time to work upon them. As analytics is driving a lot many product innovations, the hands on knowledge of applied machine learning (rather than focusing only on the mathematics behind it) will be more appreciable in industry as it will reduce the learning time of intern to understand those use cases & its applications resulting into

more opportunities to do meaningful contributions to the products innovations rather than just doing some routine software development work.

Student

Name: SHIVAM KHANDELWAL(2014HS120498P)

Student Write-up

Short summary of work done during PS-II: Made a serverless web application using AWS services. The application helped clients of the company onboard with ease. The application included crud operations mostly but the challenging part was to implement authentication, create Apis, call them from frontend. Mostly the work was around the AWS services using serverless application model.

Tool used (Development tools - H/w, S/w): React, AWS Lambda, AWS S3, AWS Api Gateway, AWS Cognito.

Objectives of the project: Serverless WEB application for amazon clients.

Major learning outcomes: Managing timeliness, structuring a project, AWS services.

Details of papers / patents: No.

Brief description of working environment, expectations from the company: Serverless application model using AWS services.

Academic courses relevant to the project: Not much.

Name: SHUBH JAIN(2015B2A70644G)

Student Write-up

Short summary of work done during PS-II: Development of a full stack service for the internal monitoring at Jobs running for my team. The dashboard keeps track of the Run and SLA status of the jobs which are getting updated on a schedule and are being stored in the database. To calculate these status, backend independent services run and pull data from SWF (AWS service), processes this data, convert them into metrics and store them.

Tool used (Development tools - H/w, S/w): IntelliJ, VScode, postman.

Objectives of the project: Build a notification and ticketing service.

Major learning outcomes: AWS services, building a full stack application from stack.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: A very nice and a beautiful place to learn and develop. Very nice working environment with very friendly and helpful teammates and managers. Would definitely recommend joining Amazon as it is a great place to learn and develop new technologies, plus you get to learn and work with AWS services of your choice. One can expect a very nice working place with a lot of learning opportunity and a great place to grow as a developer.

Academic courses relevant to the project: OOP, computer networks.

Name: PRABHUNE DARSHAN MANDAR(2015B2A70798H)

Student Write-up

Short summary of work done during PS-II: I have been working on a project called LaTeX which stands for Language Agnostic Text Extraction System. It provides a pipeline to a user for automatic training and deployment of text extraction NER models. There are four sub-components in LaTeX namely Data Fetching, Data tagging, Golden data set generation and

Hyper parameter tuning. I mostly worked on the data fetching and GDS generation parts. Data fetching required to call one of the internal services at Amazon called Catalog Search which uses elastic search to store the asin information. GDS generation a.k.a Golden data set generation is a semi-automatic step which uses AWS ground truth for manual labelling job.

Tool used (Development tools - H/w, S/w): AWS Lambda, AWS S3, AWS Step function, Java, React.

Objectives of the project: To create a pipeline for automatic deployment of NER models.

Major learning outcomes: Got to learn about steps used in text extraction models. Got to learn more about Amazon web services.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment was very employee friendly. The team members are very approachable and provide proper guidance.

Academic courses relevant to the project: Object Oriented Programming, Software development, System design.

Name: SWAYAM SHIVAY(2015B2A70801H)

Student Write-up

Short summary of work done during PS-II: AWS ordering team is building a new supply chain operation system (SC.os) ordering platform which will help clients to place orders with ease and automate the entire lifecycle of an order, right from its placement to its fulfillment. I worked on developing the shadow mode workflow for the new supply chain ordering (SC.os Ordering) platform. This will help in initially launching the new platform along with the legacy platform and

fix bugs easily. I also worked on development of the SC.os ordering portal which will be used by users to view and place orders for AWS.

Tool used (Development tools - H/w, S/w): Java, AWS services, Dagger, React, GraphQL

Objectives of the project: 1. Development of shadow mode infrastructure for the new SC.os ordering platform launch. 2. Development of the SC.os ordering portal, specifically the view order details page.

Major learning outcomes: Industry standard Java programming, Integration and unit testing, Software development cycle, Design patterns, Dependency injection framework, Agile software development, working towards fulfilling the needs of the customer.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work environment enables team members to work to their fullest potential inducing learning and implementation of innovative technology in order to solve real world problems. Everyone follows a disciplined work routine.

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

Name: ABHAY AGARWAL(2015B3A70512P)

Student Write-up

Short summary of work done during PS-II: 1. Building serverless website using AWS services (I had to build the website for my team from my end including both frontend and backend).
2. Working involves backend part which was done on AWS lambda.
3. For data storage we used Dynamodb.
4. For frontend part we used react js, flux.

Tool used (Development tools - H/w, S/w): AWS (lambda, dynamodb, redshift,iam), Dagger, Sql, React, Flux.

Objectives of the project: Build a serverless Website.

Major learning outcomes: AWS, learned building a website from scratch.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Work environment of Amazon is very customer centric. Most of the tasks, we picked at Amazon are customer centric , involves deep dive.

Academic courses relevant to the project: OOPS, Computer networking, Databases.

Name: THACKER PARTH ANIL(2015B3A70749G)

Student Write-up

Short summary of work done during PS-II: The shopping aids aims at giving informational guidance to customer by showing informational tooltips regarding new features on Amazon and aim at improved feature utilisation.

The first task was basis on capturing the journey of a shopping aid through the various backend architectures and filtering mechanisms till it reaches the end user on the device on basically capturing a lifecycle.

The second task aimed at tooling related to CloudWatch logging mechanisms. It was aimed at reducing the high costs incurred in CloudWatch systems by migrating the logs to a more cheaper data store like S3 solely for the purpose of data retention.

The third task aimed at migration task of an architecture on which the server is built since the architecture is towards the end-of-life. The task included a research into alternative architectures that could support and if possible improve the current capabilities.

The fourth task involves the building an HTML page with form. This is a static HTML page with interactive UI for filling up the form in a certain manner.

The fifth task involves delivering data from a NoSQL database in AWS to a relational database so that it can be used for data analysis for business purposes.

Tool used (Development tools - H/w, S/w): AWS tools, Spring MVC, Apache Spark, HTML, CSS, JavaScript.

Objectives of the project: 1. Write efficient code for the tasks mentioned above. 2. Follow good coding practices to make the code understandable. 3. Productionize the code. 4. Conduct robust quality analysis before code production by having sufficient testing mechanisms.

Major learning outcomes: The key learning is the core of Amazon's rendering architecture and how the system ensures high availability at huge scale not only in terms of customer traffic but also in terms of number of pages and features hosted on the retail website. The other learnings include how the page framework works in Amazon and how the shopping aids platform is integrated closely to it and what requirement are needed to migrate away from it.

The key learning was how an MVC framework is managed over Spring, Spring Beans and building a REST framework.

An important learning outcome is that migration tasks like these help in getting better well versed with the exact inner workings of platform. It lets you re-evaluate each component and helps clean up the architecture so the obsolete and non-functional components can be deprecated.

The scale at which the shopping aids service operates needs a solution which can match the high availability of the service not just in terms of latency but also any other downstream services that are used by the application needs to keep up with it or ensure data consistency.

Details of papers / patents: None. The documents were made for internal use only and confidential to Amazon.

Brief description of working environment, expectations from the company: The work environment is conducive to the overall productivity. The number of new things learnt is immense. I worked on new AWS technologies which improves the overall skill set. Colleagues are very friendly and helpful. They go out of the way to help you solve the problems and you get

immense knowledge both technical and non-technical by talking to them. The team I worked on was flexible with working hours as long as deliverables are met.

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

Name: Rinkesh Jain(2015B4A70590P)

Student Write-up

Short summary of work done during PS-II: Building a prototype of the order diagnostic tool with authentication of users.

Redesigning and implementation of interfaces of other services.

Analysis of authentication and authorization methods.

Analysis of rule engines.

Bug fixes in internal tools.

Tool used (Development tools - H/w, S/w) : Amazon web services, IntelliJ, Internal tools such as Brazil, Apollo.

Objectives of the project: Analysis of the approaches and development of a new tool for diagnosing Amazon prime membership orders and mitigation of the errors if any.

Major learning outcomes: Getting used to the development standards @ Amazon

Learnt about the tools used inside Amazon to develop and code efficiently

AWS tools and services

Unit and integration testing

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment was great and team members were very supportive.

Academic courses relevant to the project: Object Oriented Programming, Data structures and algorithms, DBMS.

Name: YAJAT DAWAR(2015B4A70620P)

Student Write-up

Short summary of work done during PS-II: I did two major projects during my internship.

First one was based on improving the existing exception handling framework which handled the incoming exceptions from dependent services. I analysed the current gaps that existed while handling the exceptions and wrote a new framework which would solve the existing issues.

Second one based on adding new features to an existing service. It included writing a new API, enabling the service for a different region and Improving the current logic using machine learning.

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

Objectives of the project: The objective of the first project was to develop a framework to handle and translate exceptions coming from dependent services and hence solving the current issues. The objective of the second project was to upgrade a service by adding new features.

Major Learning Outcomes: 1. How is software development carried out at Amazon.

2. How to design a service efficiently.
3. Setting up team meetings and speaking skills.
4. Proper way of documenting things.
5. Best coding practices in industry.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: I joined Amazon as an SDE intern in Amazon fulfillment technology. The team was really helpful and

supportive. They helped me in understanding their team processes and software development at Amazon. I was able to understand amazon culture of driving and maintaining projects by participating in different team meetings. Got the opportunity of driving some meetings related to the projects with my team as well as with other teams. It improved my confidence and gave me a sense of responsibility. Apart from this, my team had learning sessions where each team member explained some technical concepts which was really amazing. Other social events and outings helped in maintaining work life balance.

Academic courses relevant to the project: Data structures and algorithms, Object Oriented Programming, Database systems.

Name: Aman Sanghi(2016A7PS0024P)

Student Write-up

Short summary of work done during PS-II: We run cashback campaigns where customer who buy more than a certain value are offered cashbacks in the form of GCs.

Funds are added to the CPGN accounts by funding entity / seller which is used to fund the issuance of cashback.

A CPGN account can fund several promotions. Each promotion has its own pre-specified budget on whose exhaustion the promotion should be stopped.

Right now there is no mechanism to monitor the budget of promotion and stop the promotion when the budget is exhausted.

Fund manager will handle the tracking of budgets of promotions. It will notify the concerned systems of budget exhaustion to trigger the cancelling of the promotions.

I worked creating this fund manager service from the ground up.

Tool used (Development tools - H/w, S/w): Java, Guice, Mocktio, DynamoDB, SNS, SQS, AWS lambda.

Objectives of the project: The key objective of promotion platform is to enable and ensure efficient planning, execution and management of promotional campaigns. Fund management is

a key requirement for promotion platform, without which promotion creators will not be able to manage.

Major learning outcomes: Understanding of various AWS tools and technologies, Understanding of complex system architectures.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: Work environment is good. Team mates are friendly and helpful. Enjoyable workplace, flexible schedule.

Expectation: Curious to learn new things, work in a team, deliver the results.

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

Name: SANJAY D(2016A7PS0033H)

Student Write-up

Short summary of work done during PS-II: My work dealt mainly with web and app development for a particular team. I had to contribute as a regular team member which included writing design documents, analysing and comparing various technology frameworks and recording the findings. The tech stack for mobile was primarily React Native coupled with Redux written in typescript. For web, we used React. The web version had to be a multi-module single page application which required that different teams code their own modules independently of one another and host them all in one site by bundling them with the right technology. For the mobile application I coded many screens as well as components and finished an entire workflow in the app. For web, I had to integrate the UI components, the routing framework, build the components and host the site on AWS. All code written will be scrutinised by other team members via code reviews before pushing out the changes.

Tool used (Development tools - H/w, S/w): Typescript, Javascript, React, Redux, React Native, Native AWS.

Objectives of the project: 1. Create a mobile app which serves both Android and iOS at the same time based on the current Android only app. 2. Create a web version which can host multiple modules created by different teams.

Major learning outcomes: I learnt all the Amazon leadership principles and how to apply them in my work. I picked up skills such as working in a team and communicating effectively. My writing has improved by creating and managing the design / process / tech documents. I learnt technology frameworks such as React, Redux, React Native etc.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: I would rate the working environment highly positive overall. Every team member is ready to help and the managers provide you motivation. The office space is excellent with great amenities and conducive to productivity. Even after work from home was imposed, I was able to communicate effectively with my team members through Amazon internal tools and get the job done. The company has high expectations from every intern. For you to get converted from an intern to a full-time employee you will have to clear a bar-raiser review where a senior SDE reviews your work and competency in the past six months. They look for people with a sound background of the CS fundamentals, work well in a team, communicate well, and get the job done. The good mix of designing and coding will help.

Academic courses relevant to the project: Database systems, Data structures and algorithms, Computer programming, Object Oriented Programming.

Name: SHUBHAM JAIN(2016A7PS0043P)

Student Write-up

Short summary of work done during PS-II: I had to develop a search engine for all “customs data” in Broker Central. The search engine is supposed to store all customs data in an appropriate datastore and make it available for querying / searching in near real time. Once stored, we want to enable the end customers to be able to conveniently query the stored data on different parameters and view it in the Broker Central user-interface.

Tool used (Development tools - H/w, S/w): AWS tools - S3, SNS, SQS, Lambda, API Gateway, Elastic search. Other technologies like Java, HTML, CSS, Javascript were used.

Objectives of the project: Evaluate different options for the search datastore in terms of cost, ease of development, maintainability, scaling requirements, extensibility on query parameters etc. Design and development of the search.

Major learning outcomes: Cloud infrastructure and services, phased deployments, full stack development.

Writing clean, maintainable, scalable and extensible code.

Details of papers / patents: N/A.

Brief description of working environment, expectations from the company: The work environment is conducive to learn new technologies, inventing new and better ways to solve problems. People are supportive and ready to help whenever you need it.

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

Name: RAHIL MALHOTRA(2016A7PS0058H)

Student Write-up

Short summary of work done during PS-II: The work done was mostly related to improving customer experience on the advertiser pages owned by our team. Tasks done by me - 1) Sorting the payment options by recommended payment method with the button pre-selected. 2)

Displaying the payment method details in the billing history page 3) Preview invoice in the payment settings page.

Tool used (Development tools - H/w, S/w): Java, ReactJs, Junit, Selenium, Brazil, Bones, SAM, Apollo, VScode, IntelliJ.

Objectives of the project: Objective of preview invoice - Less advertiser credit and re-bill requests. Also, all projects had objects for a better U/I experience for the customer on the billing page as well as the payment settings page.

Major learning outcomes: Gained industry experience. Improved on soft skills. Learnt teamwork and delivering under pressure and timelines.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Amazon has laid a set of 14 leadership principles, most of which come to use at some stage of the other. Some of the leadership principles that i found the most relatable in the working environment were deep dive, bias for action and ownership. The expectations of the company revolve around these leadership principles and this is what they expect their ideal work force to be. Expectations are also to have a good work ethic and high amounts of motivation.

Academic courses relevant to the project : OOP.

Name: Sharvin Jondhale(2016A7PS0063H)

Student Write-up

Short summary of work done during PS-II: Set up a HBase cluster. Backfilled it using Spark. Tested it using internal tools. Interfaced the cluster using AWS ECS / Fargate service and AWS Lambda.

Tool used (Development tools - H/w, S/w): AWS, Spark, HBase, Java, Scala, Bash.

Objectives of the project: To POC a database technology called HBase and see if it can fit the team use case.

Major learning outcomes: Learnt about distributed databases and computing. Learnt about big data and the hadoop ecosystem.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Excellent working environment and top notch facilities. Work can be a bit more at times but overall a satisfactory experience.

Academic courses relevant to the project: Not many, only OS and DBMS.

Name: JITVAN HIMANSHU SHUKLA(2016A7PS0083P)

Student Write-up

Short summary of work done during PS-II: I was assigned a very interesting project called 'Reducing Network Loss in Mobile Phones'. Amazon faces a problem of loss / theft of mobile phones in it's supply / delivery chain. To mitigate this problem, this project aimed at digitally locking / unlocking mobile phones when they are in transit so that even if they are stolen, the mobile phones are not usable. My work was to implement a backend automated workflow that would be triggered by events such as delivery event, return event, etc. and perform operations on remote devices through API calls for locking / unlocking them. The project was implemented only for Samsung mobile phones as currently, only Samsung provides the functionality to digitally lock mobile phones through their Knox program. The project consisted of a forward leg in which the phone is ordered through Amazon and delivered to the customer and a reject leg in which a phone order is rejected by the customer and it is returned back to an Amazon FC.

Samsung Knox required that the phone was enrolled in their database before any locking / unlocking operations, so the forward leg requirement was to enroll the mobile phone when it is out for delivery and unenroll it when it is delivered to the customer. Also, if the phone is not delivered within 10 days from the day it was shipped, it is considered lost or stolen and it has to be locked. In the reject leg, when the phone starts its journey back to the warehouse, it has to be locked and then it is unlocked when it reaches the warehouse.

Tool used (Development tools - H/w, S/w): Java, AWS tools such as SQS, SNS, DynamoDB, CloudFormation, CloudWatch, Lambda, CDK, S3, etc.

Objectives of the project: The objective of the project was to design an automated workflow that gets triggered on internal Amazon events such as delivery event, reject event, etc. and performs operations on remote devices to digitally lock and unlock them when they are in transit.

Major learning outcomes: Proficiency in Java, Dagger, Junit, Design patterns, Proficiency in AWS tools such as DynamoDB, SQS, SNS, Lambda.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: In my internship at Amazon, I felt more like a full-time SDE taking an active part in my team's projects and day-to-day tasks. Team members were extremely helpful and inclusive. I had an exponential learning curve because all the tools were new to me. However, there was a lot of pressure from the manager for completing the project as it this project had a significant business impact and a very strict timeline. I had to work outside regular office hours to get the work done. Interns at Amazon are expected to learn quickly (even faster than FTEs) and deliver projects in a short time. I got the opportunity to work on the most interesting projects in the team and using the latest technology. Overall, I got a good head start at Amazon for my career in terms of technical knowledge and corporate experience, but work-life balance was slightly lacking.

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

Name: VARUN GUPTA(2016A7PS0087P)

Student Write-up

Short summary of work done during PS-II: I worked on 3 major domains during my internship. The first project involved externalisation of Amazon tools to the public network with added security so that they could be used in the 3PL warehouses. This included a lot of computer networking concepts like request, ports, vips and infrastructure creation as well. I got to externalise a tool whose architecture had to be changed from Middleman Ruby to Java spring because the backend couldn't be externalised due to security concerns. I got the exposure to develop the spring application from scratch. The second project revolved around adding RTL support to an application to render content in Arabic locale when chosen. This involved working on the frontend including JSP, Apache tiles, CSS and HTML. The third project was development of an android application in Kotlin using the FIDO2 API to authenticate warehouse associates. This was another great learning experience since I had no knowledge whatsoever about android and its functioning.

Tool used (Development tools - H/w, S/w): Java spring MVC, JavaScript, JSP, AWS, Kotlin, Android.

Objectives of the project: 1. Developing a spring application from scratch to serve static content of Middleman Ruby application and make AJAX calls to the backend API 2. Adding RTL support for Arabic to an application 3. Developing an android application for FIDO2 authentication.

Major learning outcomes: 1. Java Spring MVC - I knew a little bit of Java before this internship, but had never worked on any large scale Java codebase. I got to know about annotations, Spring MVC functionalities and how it has made development a lot easier.
2. Kotlin and android - I explored a lot in this domain as I had no knowledge and the task was a little complex. I got a great exposure on an activity, its lifecycle and learnt Kotlin along the way.
3. Frontend stack - I had not worked on HTML or CSS before. I got to know the working and a little hands-on experience as well by adding the RTL support.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: The working environment of Amazon is really good. The people are really supportive and will help you get on-boarded comfortably. The teams are small in size, roughly about 10 people, which gives you the opportunity to do some impactful work. You get work in all domains, backend as well as frontend, helping you to enhance your knowledge and skills.

Academic courses relevant to the project: Computer networking, Object Oriented Programming, Data structures.

Name: SHUBHAM SHARMA(2016A7PS0115P)

Student Write-up

Short summary of work done during PS-II: I have been working on the development of a new feature to be dialled up in specific locales globally. During my internship, I had to prepare the Design Document, Development Plan and a document to keep my progress updated. I also had to integrate with a backend API from a different team and do the final integration testing. There are a lot of technical learnings which I gained during my internship experience. Some of those are - an improvement in the coding standards as every piece of code is reviewed by the teammates, more knowledge about Coral services. I got to work on JavaScript, Java, JSP and Perl during my internship which gave me a wide learning experience. I learnt about Spring MVC framework, on which our Cart architecture is based on. I also got to know more about unit testing, for Java, Jsp and JS, and integration testing. Integration testing is where in we test the entire feature by integrating with all the APIs. I came to know how multithreading can be used in production to load independent features parallelly to reduce the latency. I learnt about the functional programming aspect of Java, which are lambda expressions.

Tool used (Development tools - H/w, S/w): Software - Java, JSP, CSS, Perl, JS, GIT.

Objectives of the project: To increase the repurchase by customers by reducing friction in managing items that they want to purchase so that they do not have to search for them again.

Major learning outcomes: There are a lot of technical learnings which I have gained working on the end to end development of this feature, all thanks to my manager for giving me this opportunity. Some of those are - an improvement in the coding standards as every piece of code is reviewed by the teammates, more knowledge about coral services. I got to work on JavaScript, Java, JSP and Perl during my internship which gave me a wide learning experience. I learnt about spring MVC framework, on which our cart architecture is based on. I also got to know more about unit testing, for Java, Jsp and JS and integration testing. Integration testing is where in we test the entire feature by integrating with all the APIs. I came to know how multithreading can be used in production to load independent features parallelly to reduce the latency. I learnt about the functional programming aspect of Java, which are lambda expressions.

Business learnings include better team player, an increase in peer network, how even a minute change can break the code in production and has to be reviewed thoroughly. The intern leadership talks organised from time to time helped me get a better understanding of Day 1 culture and the leadership principles which our leaders actually follow during their work. I learnt how not to get blocked on one thing but to start with some other module parallelly. I realised how Amazon fulfillment centers help speed up the delivery process and keeps up with the customer obsession leadership principle. As a business learning, I realised how important scrum meetings are, to keep everyone updated about the other projects going on in the team.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The interns were allotted a separate workstation. There are regular meetings for the updates on the projects and demos with the skip level manager for the monthly incremental updates. The company expects every intern to follow their confidentiality policy for which they have frequent compulsory learning sessions. As an employee, we are expected to finish our work by the deadlines decided mutually with the mentor and manager.

Academic courses relevant to the project: Object Oriented Programming, Data structures and algorithms, Operating Systems, Computer Networks.

Name: AMIT BANSAL(2016A7PS0140P)

Student Write-up

Short summary of work done during PS-II: Worked on 3 projects, developed a tool (end-to-end) using HTML, AngularJS, CSS and Backend APIs in Java. Implemented unit test cases for both frontend and backend. For the second project, made a pipeline used by the team, full CD (Continuous Deployment) by implementing different steps (integration testing, setting up deployment windows and setting up environments). For the third project, built a data pipeline to automate the job creation workflow on AWS sagemaker groundtruth using AWS Lambda and AWS step functions.

Tool used (Development tools - H/w, S/w): HTML, AngularJS, Python, AWS Lambda, AWS Sagemaker Groundtruth, AWS step functions, Java, Mockito, Karma Jasmine testing framework.

Objectives of the project: 1.Develop a tool end-to-end to be used by the associates for receiving the transshipment. 2.Make the pipeline used by the team, full CD 3.Build a data pipeline using AWS Lambda, AWS step functions and AWS sagemaker groundtruth.

Major learning outcomes: AngularJS, Unit testing, Integration testing, AWS, Debugging process, Code style and review, API Implementation.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Helpful team members and mentors. Discuss issues that you are facing with your manager and mentor. Daily stand-ups are there to discuss the updates and progress in the tasks assigned.

Academic courses relevant to the project: OOP.

Name: AMEYA ZOPE(2016A7PS0721G)

Student Write-up

Short summary of work done during PS-II: The work done at PS-II was amazing. I was involved in code maintenance activities, experiment creation, handled the UI for a feature launch for India marketplace and also created a Web application as per the needs of the team. The work done has motivated me to have a deep dive into the software development world, the tools used and the good practices that need to be followed while developing a software.

Tool used (Development tools - H/w, S/w): IntelliJ, VS code, all other tools used were internal to the company.

Objectives of the project: Code maintainance, New feature launch for customer.

Major Learning Outcomes: Introduction to full stack software development and the good practices that must be followed as a software developer.

Details of papers / patents: No paper / patents published.

Brief description of working environment, expectations from the company: Working environment is great, raise the bar as much as possible.

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

Name: SURYA S VARMA(2018H1030040G)

Student Write-up

Short summary of work done during PS-II: I am working for prime video payments international expansion team. I have worked in different areas, did coding, debugging, testing etc, in the team's service and also other services owned by different teams. I got the opportunity to work in different internal tools and services of amazon. As my project is confidential, I can't say anything about it. Learned many new technologies and softwares.

Tool used (Development tools - H/w, S/w): Java, Guice, Apache Camel, SQS, SNS, HTML.

Objectives of the project: Objective of the project was to improve customer experience.

Major learning outcomes: Learned new languages, worked with many qualified software engineers, used many new softwares.

Details of papers / patents: Confidential.

Brief description of working environment, expectations from the company: Working environment was really good. After WFH was started, I struggled to remain organised in the new environment. I was overwhelmed and my work style was chaotic for several weeks before I finally found solutions that suited my work style. But daily scrums and weekly meetings helped me a lot to tackle these problems. Company expects you to deliver results, take ownership and be obsessed with customers.

Academic courses relevant to the project: Cloud computing, Real time systems, Advanced algorithms.

Name: Nagendranath Y R(2018H1030098H)

Student Write-up

Short summary of work done during PS-II: Worked on QR login for Amazon pay GLOBAL to ease login experience. It was done as an experiment in JAPAN.

De-boarding ES cluster and preventing it to produce logs as it generated logs of several TB's.

Dynamo DB - Updating a row with some of its attributes having NULL values was carried out in a tedious process. I updated the code to make it simpler by using DELETE attribute update for NULL values.

Tool used (Development tools - H/w, S/w): Weblab, IntelliJ, RubyMine.

Objectives of the project: Ease login experience.

Major learning outcomes: Thought process to approach critical problems.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is friendly. Don't expect spoon feeding in Amazon. They will tell us what we have to do, not HOW. This is where our skills play a major role.

Academic courses relevant to the project: Algorithms, Data structures.

Name: R KARTIK NAIKER(2018H1030102H)

Student Write-up

Short summary of work done during PS-II: Backup Payment Method (BPM) - One Click Launch: This project's main aim is to related to BPM worldwide expansion. For this service, there are many touchpoints (~40) due to which it takes 6-7 months for the service to be launched in new market place. Most of these touchpoints are weblabs. Post the removal of these weblabs, the service can be brought up in new market place in a matter of few days or weeks, hence enhancing customer experience.

Tool used (Development tools - H/w, S/w): Java, TestNG, Mockito, Internal tools of Amazon.

Objectives of the project: Remove touch points for BPM worldwide expansion.

Major Learning Outcomes: Leadership principles of Amazon and its applications in day to day work; Like Operational Excellence, Dive deep, Bias for Action, Ownership.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Mentors are helpful, expectations from interns is that we become more independent as we get more familiar with the tools and take complete ownership of the tasks assigned to us.

Academic courses relevant to the project: Data structures and algorithms, Software engineering.

Name: AMLAN SAIKIA(2018H1030173H)

Student Write-up

Short summary of work done during PS-II: I was involved in majorly three tasks in my team. My first task was to increase the code coverage of a backend package. Next task was to make the backend changes for reducing the latency of an internal Amazon tool. Third task was related to integrating a datastore service that stores values based on session id to solve redirection issues in an Amazon tool. In addition to this I also solved some UI issues in production, worked on migrating amazon internal spoofer access, did string id translation etc.

Tool used (Development tools - H/w, S/w): Java, IntelliJ IDE, Mockito, Powermock, Junit, Git and internal Amazon tools.

Objectives of the project: Objective of the first task was to increase the code coverage of a package above 90%. Next task was related to investigating and making changes to reduce latency in reports of an internal amazon tool. The third task was to integrate a key value data.

Major learning outcomes: Learnt a lot about technologies like Java, Mockito, Junit version control systems like Git and about internal amazon tools.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is Amazon is really flexible. However, you need to always try to apply the 14 leadership principles in your work like dive deep, take ownership etc. which require you to thoroughly investigate and solve any problems using the resources available. People are ready to help and guide you if you are stuck. When we are given a task, we are expected to come up with the best approach and solve problems independently. Overall, it is very good learning experience.

Academic courses relevant to the project: OOPS, Database.

Name: SHREEDHAR BIMALKUMAR DALAL(2018H1120283P)

Student Write-up

Short summary of work done during PS-II: I done 2 projects.

Project 1: Testing (regressions + unit) a utility deals with flat file format. It was a complex process and improved the quality of the project in the organisation.

Project 2: Developed a feedback collecting mechanism which collects user activity and suggestions from end users. Complex to implement in existing system. Used aspects of service oriented architecture, UI technologies and spring framework.

Tool used (Development tools - H/w, S/w): SpringBoot, Lombok (patterns), ExcelReader.

Objectives of the project: Project 1: Testing (regressions + unit) a utility deals with flat file format. It was a complex process and improved the quality of the project in the organisation
Project 2: Developed a feedback collecting mechanism which collects user activity and sugge.

Major learning outcomes: Handle a complex and big project. Complete an end to end system looking with every aspects of the solution in a detailed view.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The work environment is very friendly with each team members were very helpful in blockers. Kept helpful discussions and learning sessions to understand some internals.

Academic courses relevant to the project: Cloud computing, Software testing, Object oriented design and analysis.

PS-II Station: Amazon Development Center, Hyderabad

Faculty

Name: T Venkateswara Rao

Student

Name: SATULURI SAI SRI ABHIRAM(2015B2A70746H)

Student Write-up

Short summary of work done during PS-II: My project involved building backend service to add / delete / get / modify rules (objects) to / from the rule files (S3 BUCKETS). It was to replace initial setup where there was no proper validation of rules. I created a service with proper CLI setup which included all the above options with proper validations. To begin with, I was given a high level design showing the flow to work with and I wrote the low level design by myself. I next started the implementation using AWS services like API Gateway and Lambda to setup a service. I wrote the activities for the above mentioned four tasks. I tested my code using the test option provided by API Gateway. After that, I wrote unit tests to make sure the correct functioning of the service. I raised a code review for the entire service followed with validations

review. After that, I made sure that the pipeline was working fine and built gamma and prod stages in addition to beta stage which I was working on till then. Then, I pushed my code to deployment.

Tool used (Development tools - H/w, S/w): Aws services like S3, SQS, SNS, API Gateway, Lambda.

Objectives of the project: To replace the existing setup to add / delete / get / modify rules with a new setup with proper validations.

Major learning outcomes: Code design, System design and Time management.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The experience of working at Amazon has been enriching. I learned how the real industry works and importance of time management to meet deadlines. I learned how to write industry level code and gained very good insights from the developers here. The learning curve has been steep but I have been able to adjust.

Working from home was quite challenging as I did not get much face time with my mentor or manager. Also, the WFH setup was not that comfortable. After some time reimbursements were provided to purchase the essentials so this improved the productivity.

Academic courses relevant to the project: DSA, OOPS, Compiler construction.

Name: VIJITHA GUNTA(2015B3A70491H)

Student Write-up

Short summary of work done during PS-II: I worked in the customer returns transportation team. I did a refactoring ramp-up task and then worked on building a dashboard with a teammate for internal business use.

Tool used (Development tools - H/w, S/w): Technology stack used is Java Spring, Angular, AWS dynamo DB, AWS SNS, AWS Lambda.

Objectives of the project: Build a dashboard for internal business stakeholders to view and edit external store partner data.

Major learning outcomes: 1. Working in production environment and with different stakeholders and delivering task on time.
2. How to investigate various approaches for a problem and decide best design and also how to debug efficiently when dealing with big services.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment was very supportive. It was very fast paced and expectations in terms of delivery and code quality were high.

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

Name: HIMANSHU BADLANI(2015B3A70548H)

Student Write-up

Short summary of work done during PS-II: Make API calls and try to make sure the API always returns a correct response even if there is a small anomaly in some response make sure to call alternatives like calling a different API in that case. Do testing on production server's and make sure everything goes as expected and errors shouldn't be there, monitor the metrics published to see everything is going right and then push it in production server.

Tool used (Development tools - H/w, S/w): Java, metrics analyser, Host logs and monitoring.

Objectives of the project: Calling API's and Monitoring the response.

Major learning outcomes: It helped me understand how things happen in the backend and how production level testing is done to make sure everything is correct.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work culture is quite good, peers are really helpful if you are stuck at something, you are given a project which you need to complete in the given time frame.

Academic courses relevant to the project: Object Oriented Programming Language, Database systems, Computer networks and Operating systems.

Name: Vishnu Teja Narapareddy(2016A7PS0086H)

Student Write-up

Short summary of work done during PS-II: Worked in the Amazon business organisation. I was responsible to develop UI and backend services for a new customer facing feature. Web development was done using spring MVC framework. I worked on developing UI assets with javascript (jquery), css and JSP for the html. I developed backed java services to perform CRUD operations on an AWS DynamoDB. Finally, presented and completed a demo of my work to senior management.

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

Objectives of the project: Develop new feature for website.

Major learning outcomes: Front-End development (jQuery, CSS), Spring MVC, JSP, AWS DynamoDB, AWS ECS.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Amazon uses a lot of internal tools for software development. One needs to spend a good amount of time to learn them and grasp the concepts behind each tool. In the early days, an intern is expected to familiarise with the tools and if possible, contribute to ideas for a project to be taken up. Mentor is your most valuable resource, one should be able to communicate effectively and not hesitate to ask for help when needed. Amazon works in an agile environment, so everyone is expected to give crisp updates and finish development upto production deployment.

Academic courses relevant to the project: Software engineering.

Name: SIDDHARTH KASHYAP(2016A7PS0122H)

Student Write-up

Short summary of work done during PS-II: Worked on creating a service that helped to analyze the error occurring in the document that is generated as a part of my team, which helps carrier in the proper transportation of the goods. The service aim to leverage the error-report and generate insightful metrics and generate emails containing trend data and tops errors occurring. This helps also to root-cause a issue and find the service from where the issue arose.

Tool used (Development tools - H/w, S/w): AWS services - KMS, S3, RedShift, SES, Lambda, Athena.

Objectives of the project: Service to help analyze the errors generated in the documetns.

Major learning outcomes: Got to learn about different cycles of software- developments. From understanding the requirements of the project, designing (High-level and low-level), learning new services, coding following the highest standards of code, testing using unit-test.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment in Amazon was very friendly, with the colleagues very supportive. They always praises the achievements of each-other, which help to promote a very supportive, friendly as a competitive environment. The company has a very high expectation from each and every employee and also at times the work-pressure is quite high.

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

Name: Utkarsh Kumar(2018H1030055G)

Student Write-up

Short summary of work done during PS-II: During my internship, I was given multiple projects to work on. It included AWS based application backend development. Enhancements into existing architecture and microservices. Exposure to various AWS services.

Tool used (Development tools - H/w, S/w): AWS Services, Java programming language, Python programming language, Jupyter notebook, IntelliJ IDEA, AWS EMR notebook.

Objectives of the project: Enhancement in the manage seller fulfilled prime service, Peeknow enablement of SSR, Manage SFP pages, Retry mechanism for failed events, Operational excellence tool for team.

Major learning outcomes: AWS based software development lifecycle, Java backend development, Python scripting, Microservices architecture, High level and low level design of services.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment at Amazon is great. Peers are helpful. Manager ensures that the overall internship experience is smooth.

Academic courses relevant to the project: Software architecture, Cloud computing, Object Oriented Programming, Network security.

PS-II Station: Amazon Development Center, New Delhi

Faculty

Name: Sugata Ghosal

Student

Name: VINEET AGARWAL(2015B4A70469G)

Student Write-up

Short summary of work done during PS-II: 1. Request tracing in WebApp and 2. Data privacy in frontend UI 3. Log tracing in slapshot 4. Setting up a stack 5. Validate reimbursement.

Tool used (Development tools - H/w, S/w): IntelliJ, Brazil, Lombok, JavaScript, HTML, CSS, JAVA etc.

Objectives of the project: 1) Successfully setting up log tracing in frontEnd 2) Fulfilling the paragon security mandate 3) Enabling TRACE in slapshot 4) Successfully setting up a new stack 5) Validation.

Major learning outcomes: I learnt,

1. How to work in a team in a corporate environment.
2. OOP as I worked in JAVA extensively.

3. How development is done in a big company and how to use various tools to contribute to it.
4. Estimate and deliver projects on time.
5. How to grow your career and what options I have.

Details of papers / patents: No.

Brief description of working environment, expectations from the company: The working environment was professional yet flexible. It was a great learning opportunity both for technical skills and professional skills.

Academic courses relevant to the project: Data structures and algorithms, Database systems, Computer networks, Object Oriented Programming.

Name: PRAKHAR HASIJA(2016A7PS0082G)

Student Write-up

Short summary of work done during PS-II: I interned at the core trans tech team at Amazon. Worked on improving exception handling of a particular service for improving the delivery of packages by Amazon in North America and Europe. Added metrics for monitoring latencies, number of hits, etc of dependency of a service.

Another project which I worked on was automating testing framework used by the team to replay PROD requests onto testing environment by plugging in a request transformation logic.

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

Objectives of the project: Automate testing using request translation.

Major learning outcomes: JAVA , Object oriented programming principles, Design patterns.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Amazon provided positive, motivating and learning environment for development of professional, personal, technical and soft skills. A mentor was allotted for technical help and understanding flow and design of services being used in and by the team.

Academic courses relevant to the project: Object Oriented Programming , Data structures, Database systems.

Name: BHAVISHYA KUMAR(2016A7PS0726G)

Student Write-up

Short summary of work done during PS-II: I had two different category of projects allocated:

- 1) Machine learning: I was working on creating a classification service for a library that will classify assets into different categories (ex: product, lifestyle). I used the AWS rekognition library to detect labels. My service was supposed to be integrated with other components of the library to provide better search functionality. I used Machine learning principles and development principles to develop my service for library.
- 2) UI: Our team had requirement of building UI components for their main project. I was given the task of creating one main component (search-box component) which had 4 sub UI components. My scope included building all the 4 components, integrate them with backend API and writing their jest and enzyme unit tests and testing end to end.

Tool used (Development tools - H/w, S/w): AWS services, Amazon internal UI library, ML principles, react-js, Amazon internal development software.

Objectives of the project: I was expected to finish my projects within timeline and follow proper industrial programming principles while developing.

Major learning outcomes: I learnt about development principles, UI designing, machine learning.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: Our team was smaller than the average size, so per head work was relatively more in comparison to other teams. We were part of the main projects that team was working on. We had to work like an employee, raise code reviews, follow proper coding principles, deep dive into topics, present our work to local team as well as to team settled in Seattle. Initially, there was a good work life balance but due to corona case work from home (WFH) was implemented. WFH created time management issues. Often interns were working out of regular schedule and it took around 2 months for things to become normal. Overall, work offered in this PS Station was good and very highlighting for CV as well.

Academic courses relevant to the project: Data mining, DBMS, Machine learning, OOP, Computer networks, DSA.

Name: KUMARI POONAM SINGH(2018H1030123H)

Student Write-up

Short summary of work done during PS-II: To make the Service (TRDoc validator service) Full CD, that involves completing the unit test, integration test for the constraints added upon publishing the metrics to view the behavior of document after validation. Also, involves creating the PDX stack (us-west-2 retail region) for the service stack expansion and enable the cloud auth for the same in order to have ssl on host termination.

In order to do the FULL CD of TRDoc validator service plugin,

Did the metrics publications and creating alarms for the same.

Checking the timber logs for the same.

Completed Integration test.

Setup PDX stack for the service availability in the us-west-2 retail region.

Enable cloud auth the secure connection between the client and server and for the ssl on host termination.

Work towards proposing solution to automate the integration test.

Tool used (Development tools - H/w, S/w): AWS, IntelliJ, Coral service framework, ruby, Java, springboot.

Objectives of the project: To make the service (TRDoc validator service) Full CD, that involves completing the unit test, integration test for the constraints added upon publishing the metrics to view the behavior of document after validation. Also involves creating the PDX stack.

Major learning outcomes: Problem solving skill, CI/CD, AWS.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Tech stack and work culture is great, got to learn new technology, employees are very helpful, growth opportunity at personal and professional level, looking forward to greater learning opportunity in future.

Academic courses relevant to the project: Research project on cloud computing, Advance computer networks, object oriented design.

Name: PALAK VIJ(2018H1030146P)

Student Write-up

Short summary of work done during PS-II: Creating a document visualizer utility which can visualize the document V5 and remote plugin string as an entity-relationship graph. Document model is the de-facto Amazon implementation of the entity-relationship model. It is the basic data structure extensively used by the team. Various features such as adding an entity to the document, deleting an entity from the document and updating the data of the entity was added. Apart from this, conversion of Document V5 to remote plugin and vice-versa was also added.

Tool used (Development tools - H/w, S/w): Java, IntelliJ IDEA, Spring, Google guice, Javascript and other internal tools.

Objectives of the project: Development of the document visualizer utility with all the features added.

Major learning outcomes: Coding practices, Software design, Mockito (Unit testing framework).

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Amazon has flexible working hours. People here are very helpful. A person can become a better software engineer because of the coding standards followed here.

Academic courses relevant to the project: Java, Object oriented analysis and design.

PS-II Station: Amazon Operations (Area Manager), Hyderabad

Faculty

Name: Sandeep Kayastha

Student

Name: ZAINUL BELGAUMWALA(2016ABPS0612H)

Student Write-up

Short summary of work done during PS-II: 1) Performed duty of an area manager and ran a shift completely, which included planning manpower deployment, setting daily targets of productivity and achieving them.

2) Worked on my projects which included improvement of various metrics and analyzing data and doing a root cause analysis to solve the problem.

Tool used (Development tools - H/w, S/w): Various web portals used at Amazon for tracking and excel.

Objectives of the project: To drive metrics to achieve the targets and improve productivity.

Major learning outcomes: 1) Managing time

2) People management and handling

3) Leadership

4) Bias for action

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Amazon is a fast pace company and they expect you to be at par with the pace. There's a lot to learn and a lot of scope for growth of personality and skills. It does become hectic at times and work-load might be overwhelming.

Academic courses relevant to the project: Courses like supply chain management, Lean manufacturing and Manufacturing management were relevant.

PS-II Station: Amazon Operations (Area Manager), Sonipat (Delhi)

Faculty

Name: Sandeep Kayastha

Student

Name: S ADITYA SANKARAN(2016A1PS0621H)

Student Write-up

Short summary of work done during PS-II: I had to develop a tool which simplifies the need for looking at various portals for important metrics and unifies it in one single excel macro and also ensure objects are stowed in time or not.

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

Objectives of the project: To make a dashboard and maintain various other metrics.

Major learning outcomes: Became proficient in excel and upped my people management skills.

Details of papers / patents: No

Brief description of working environment, expectations from the company: It was a very good company. No company gives young interns the exposure unlike here and there aren't any layers of bureaucracy you can freely talk to whoever you want.

Academic courses relevant to the project: Probability and statistics.

PS-II Station: American Express - Big Data Labs (BDL), Bangalore

Faculty

Name: Vimal S P

Student

Name: RAHUL SAXENA(2016A7PS0027P)

Student Write-up

Short summary of work done during PS-II: American express has a huge database of customers and vendor businesses that they send hundreds of advertisements and other promotional materials to every year. These need to abide by a set of regulations set by global

governing bodies. To check their compliance, every creative needs to go through a "checklist" and a human reviewer answers each question, which can be quite dull and arduous.

My task during this internship, was to build a tool where this process can become easier. So,

1. I first added some new functionalities to the VC (Version Control) tool that helps reviewers compare different versions of a creative.
2. I wrote code for Comment-Interpretation, so as to automatically check if the previously marked corrections have been made.
3. I built the platform for automated MCR. Here, the checklist is suppressed (based on metadata and the responses to a questionnaire), then data elements are extracted from the creative and the checklist is re-prioritized. Then, T&C validation, data field-validation and checklist-validation (partial) is performed, and an error report is generated, to be sent back to the marketer.

Tool used (Development tools - H/w, S/w): Python, PostgreSQL, HTML, REST framework.

Objectives of the project: I had to build a platform for automating the marketing creative review process that every creative review produced by American Express must go through. This includes refining the Version Control tool, automating the compliance checklist and automating through MCR.

Major learning outcomes: 1. How to write clean, well-structured and properly-documented code.

2. Understanding the problem-statement well before tackling the code.

3. How to go over previously written code and tailor it to your needs.

4. Backend database design.

5. How to apply classroom-taught concepts (from courses like DSA, Information Retrieval, DBS) in an industrial setting.

6. API design.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: American Express is a fun place to work. The team structure is close-knit and employees get the chance to work on a range of projects. There are daily one-on-one's with your supervisor and teammates, as well as weekly huddles with the whole AI team. Another great factor is the absence of micro-managing. Even as an intern, you will get the freedom to explore your own

ideas and debate with seniors about the best course to take. There are even fun events like team lunches.

Academic courses relevant to the project: Computer programming, Data structures & Algorithms, Database design, Information retrieval.

Name: ISHIT JAIN(2016A7PS0052G)

Student Write-up

Short summary of work done during PS-II: Built an end to end pipeline for two internal platforms of the company. This included the whole database design, development of backend services and the UI. Also developed scripts for automatically coalating data from multiple sources and ingesting that into the database. Along with this as a separate project, I had to develop a method for categorising the python notebooks written on their platform as ML or analytics.

Tool used (Development tools - H/w, S/w): ReactJs, Django, Python, JavaScript, Elasticsearch, PostgreSQL.

Objectives of the project: 1) Develop an automated end to end pipeline along with the dashboard for AI marketplace and ML studio. 2) Develop a method for categorising the notebooks written on the ML studio platform as either ML or analytics.

Major learning outcomes: Creation of an end to end pipeline, creation of Django and ReactJs application, better grip over python and JavaScript.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment is good. You can have a good work life balance and the colleagues are really helpful.

Academic courses relevant to the project: Database management, Machine learning, Software development.

Name: ITIYALA SONIKA(2016A7PS0099H)

Student Write-up

Short summary of work done during PS-II: I have worked on adding new feature support to the PMML based scoring of the models built using a machine learning algorithm. The project required a thorough understanding of the PMML documentation. The project mainly involved making the design to add the feature and the implementation of this design to a machine learning algorithm. It also involved working on an open source project. Mix of software development and machine learning.

Tool used (Development tools - H/w, S/w): Jira, Stash, Pyspark, JPMML, PyPMML, PyPMML-spark, C++, Scala, Python.

Objectives of the project: Enable PMML based scoring of the models built using a machine learning algorithm by adding the support for model interpretation and multi class models.

Major learning outcomes: Understanding huge code base, Understanding the importance of design before implementation, Learning a new programming language, Collaboration with the team and soft skills.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Flexible timings and a pleasant work environment. All the employees are knowledgeable and are always approachable. Lot of research and development work going on in the field of AI.

Academic courses relevant to the project: Machine learning, Foundations of data science, OOP, DSA.

Name: AAKASH LAKHERA(2016A7PS0310P)

Student Write-up

Short summary of work done during PS-II: The project was related to Deep Active Learning. We needed to work on new ranking metrics and algorithms to improve Active Learning process with respect to named entity recognition. The project also involved working on the Annotaion UI using AlpacaTag to give an end to end pipeline.

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

Objectives of the project: Come up with new ranking metric and algorithms for Active learning, and set up and end-to-end pipeline using AlpacaTag.

Major learning outcomes: Learnt about Active Learning and various techniques used in it.
Learnt how to be research oriented.
Learnt about the work culture of American Express.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment is great. My mentor and manager were just awesome people to work with. So the people are awesome.

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

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

Faculty

Name: Ashish Narang

Brief write-up on each PS-II station: American Express, also known as Amex is an American multinational financial services corporation headquartered in New York. The organization is best known for its credit card, charge card, and traveller's cheque businesses. Amex offers internship in various business units including Amex Technologies, Amex Big data labs and Amex capabilities. Students are exposed to project assignments based on predictive modelling, modernizing the internal risk platforms, automation by designing and implementing web applications. Technology stack includes MySQL, Hive, python, PySpark and React etc. Organizations prefer students who have done courses like Artificial Intelligence, Machine Learning and Deep Learning and have good hands on experience on python. Additionally, they prefer interns who are good researchers, eager to learn new stuff, open to work on different technologies and have excellent communication skills.

Student

Name: VICHARE SHANTANU SURYAKANT(2016A3PS0156P)

Student Write-up

Short summary of work done during PS-II: Reject inference is an essential process which is used to approximate defaults. Current modeling techniques for reject inference take a lot of valuable time and can be automated by implementing the business logics in an end-to-end process flow. This process is developed and deployed on the available distributed systems infrastructure at American Express based on Spark and Hive frameworks.

This project aims to automate the problem of Reject inference for all the markets of American Express. The capability is developed using Japan market but is designed to be modular and parametrized for ensuring its applicability across other markets.

Apart from the automation of the current manual practices of the current RI process, this project has several features which make it a powerful tool. There are several optimizations like memory-usage control by selectively loading data variables and allowing scalability of data to be

future proof. This project boasts an End-To-End (E2E) functioning capability without user intervention throughout the RI process.

In the analysis reports of intermediate results, variables and iterations are automatically ranked for minimal dependence on experts and generating quality reports for the user to intervene and fine-tune the process flow. Overall, this project builds on the shortcomings of the current process but does not limit to it and provides an E2E solution capable of scaling by data and extrapolating to markets.

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

Objectives of the project: Design a generalized modular framework in Spark for automating the Reject inference process which is used to approximate the dependent variables for decision score models of declined applicants. The capability would run data preparation, model building and scaling by data and extrapolating to markets.

Major learning outcomes: Enterprise-level work experience. Product development cycle. Big data tools like Spark and Hive.

Details of papers / patents : Not Applicable.

Brief description of working environment, expectations from the company: American Express maintains a unified big data platform. Adaptation to a distributed systems infrastructure has become crucial to take advantage of this and is implemented on the Spark framework.

Academic courses relevant to the project: Operating Systems, Information Retrieval, Data Mining.

Name: PIYALI MANNA(2016A3PS0226P)

Student Write-up

Short summary of work done during PS-II: Regulatory capabilities were merged into one single capability to reduce redundant code and calculation.

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

Objectives of the project: Merging of consumer and commercial regulatory capability for more efficient execution and less operational risks.

Major learning outcomes: Pyspark, Python, Regulatory reporting.

Details of papers/patents: NA.

Brief description of working environment, expectations from the company: Good working environment. People were very helpful.

Academic courses relevant to the project: NA.



PS-II Station: American Express Big Data Labs, Gurgaon

Faculty

Name: Ashish Narang

Student

Name: GARGI BALASUBRAMANIAM(2016A7PS0365G)

Student Write-up

Short summary of work done during PS-II: As part of the research internship, I worked on producing prediction intervals in regression. My work involved:

- Improving the internal algorithm for producing prediction intervals.

- Establishing a baseline using decision trees.
- Carrying out an in-depth study of ensemble and boosting techniques, specifically in the context of XGBoost.
- Conducting a literature review on previous methods for calculating confidence measures in regression.

Tool used (Development tools - H/w, S/w): Language: Python, Libraries: Sklearn, Pandas, Numpy.

Objectives of the project: To quantify the reliability of regression predictions by prediction intervals.

Major learning outcomes: It was a holistic and well rounded experience to conduct research in an industrial setup where I got the opportunity to work with real life business datasets. The work culture was nourishing and helped me understand the methodology of carrying out research in a measured way, driven by the needs of various business teams in the company.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment was conducive to carrying out research in an industrial setup where the science has to be used by business teams tangibly. As an intern at American Express, it was a very good learning experience to understand not only how research is conducted, but also how communication happens with senior leaders and the importance of brevity and conciseness in communication.

Academic courses relevant to the project: Machine Learning, Artificial Intelligence, Neural Networks.



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

Faculty

Name: Satya Sudhakar Yedlapalli

Student

Name: HARI KRISHNAN A(2018H1230145G)

Student Write-up

Short summary of work done during PS-II: Worked on a real time project on Design, verification of a camera serial interface based on UVM/ SystemVerilog.

Learnt various scripting languages like Perl, Python, etc. for test automation and applied them in my project.

Also worked on extracting functional coverage metrics for the implemented verification IP.

Tool used (Development tools - H/w, S/w): IMC (Integrated Metrics Center)

Cadence Xcelium Simulator

Simvision

Objectives of the project: Implementing a verification IP for camera serial Interface.

Major learning outcomes: Learnt advanced skills on Design, verification using UVM / SystemVerilog.

Details of papers / patents: NIL.

Brief description of working environment, expectations from the company: Very helpful mentors and senior members, interactive team members. A good and safe working environment to work as a productive team player.

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

Name: Likhith V(2018H1400133G)

Student Write-up

Short summary of work done during PS-II: I was assigned to work on Robot Operating System 2 (ROS 2) which uses Data Distribution Service (DDS) as its middleware for transporting data. The rationale to choose ROS 2 over ROS is DDS which provides dependable, scalable and real time data exchanges using publish-subscribe pattern. The project was still in Proof of Concept (PoC) stage and I was assigned to show some demos of ROS 2 using a rapid prototyping platform like Raspberry Pi. I interfaced some SPI sensors, I2C sensors and a camera with Raspberry Pi and used ROS 2 framework (with DDS as middleware) to send sensor data and image streams from Raspberry Pi to a laptop using Ethernet as well as Wi-Fi.

Tool used (Development tools - H/w, S/w): Hardware: Raspberry Pi 3 Model B+, EVAL-ADXL362-ARDZ, EVAL-ADT7420-PMDZ.

Software: ROS 2 Dashing Diademata.

Objectives of the project: To show some demos of Robot Operating System 2 (ROS 2) using a rapid prototyping platform like Raspberry Pi.

Major learning outcomes: Learned about Robot Operating System 2 (ROS 2) framework and Data Distribution Service (DDS).

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment is amazing with passionate peers. There is steep learning curve. The managers are extremely supportive, they welcome our ideas and give lots of flexibility.

Academic courses relevant to the project: Embedded System Design, Network Embedded Applications.

PS-II Station: ARM Embedded Technologies Private Limited, Bangalore

Faculty

Name: Rekha A

Brief write-up on each PS-II station: The students are working in various domains like VLSI, wireless communication etc. Some of projects they are working are in the analysis of throughput of the HSDPA channel, 4G MAC layer, implementing non-coherent interconnect component with R class CPUs , System compliance for ARM based servers, Design of static RAM cell , verification/validation etc. Initially the students were given training by the organisation on the various tools and technologies used. Students worked on various tools and languages like C, python, Linux/UNIX, verilog, Labview, computer architecture, shell scripting. Awareness of scripting languages, programming concepts and computer Architecture are the areas the organisation is looking at for the various projects.

Student

Name: Joel O B(2018H1230160G)

Student Write-up

Short summary of work done during PS-II: CPU verification. Verified whether their new CPU have registers properly comply with the arm architecture. If not complying with architecture, need to raise the bug with the design team and get it resolved. Work related to RTL verification.

Tool used (Development tools - H/w, S/w): Questasim, Synposys verdi, Virtual machine.

Objectives of the project: Debug the CPU RTL, find bugs.

Major learning outcomes: Learned Perl, python, system verilog, RTL debug flow, ARM assembly, ARM architecture and extensions.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment is good. Was given a live project on request. Team members were very friendly and helpful. Other project team members were also willing to help. Half of the PS done at home (pandemic), but was still able to connect with everybody.

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

Name: Soumyajit Bhanja(2018H1230162G)

Student Write-up

Short summary of work done during PS-II: In my work, I tried to automate the process of test case generation and coverage collection for Arm architecture. Before verifying any processor architecture, a verification engineer should have every test scenario getting generated. This is called Coverage Collection. The coverage reports are generated every week. The coverage report of two consecutive weeks are compared to know which all test cases are missing in one of the report and not in other report or the test cases missing in both the reports. Since this is done every week, it can be automated. Test case generator gave required number of test cases. Then, coverage was collected using Coverage Collector. During this step, the architecture version of interest was specified. It generated coverage reports in html format. But coverage collector also merged the test cases and QuestaSim made use of this merged test cases and generated the coverage reports in text formats. A Python code was also developed which took two coverage reports in text formats. In a coverage report, under each test case there were several bins. Each of these bins was compared with the bins present under the same test case of the other coverage report and uncommon missing bins were obtained. These details were put in 1st output text file. The 2nd output text file gave the difference in the number of test cases those were generated as well as the difference in the number of test cases those were not generated in the 1st & 2nd input coverage reports.

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

Objectives of the project: To automate the process of random test case generation and collection of coverage of any particular version of Arm architecture using Python thereby reducing human interference.

Major learning outcomes: I got enhance my programming skills in Python, learnt to use industry standard tools and got to work in team.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: ARM is a great place to work at. My manager, mentor and other engineers are very helpful. I was provided with company's accessories like laptop, headphone to work with. There were regular meetings with the interns' handler. Even, director of the department wherein I was working, was keen on getting the interns' viewpoints. The work culture of the company is very nice. The atmosphere provided for the working was very congenial.

Academic courses relevant to the project I had used Python language in my below courses CAD for IC Design, Introduction to Artificial Neural Networks.

Name: TULIKA SINGH(2018H1230245P)

Student Write-up

Short summary of work done during PS-II: I worked in the physical design group at ARM. The group was dedicated to design of memory compilers. My project focused on developing an algorithm by incorporating Machine Learning, that could reduce the simulation time of the memory compilers. The idea of the project was to train the neural network on a given set of PVT corners and predict the results for a new PVT corner. The goal is to predict the data instead of simulating or interpolating, because simulation takes a lot of time. The scripts were developed in Python and Shell. Apart from this major project, I have also learnt the memory design flow and were given assignments on writing SPICE deck for calculating gate capacitance in a circuit for power and delay. I have also generated various files / views like .cdl, .lib, .def, etc.

on the tool for an instance. The internship made us to learn scripting, design of SRAMs and various etiquette to perform well in industry.

Tool used (Development tools - H/w, S/w): Anaconda, Python Interpreter, Pegasus, Spice and Spectra.

Objectives of the project: To learn designing of SRAM, develop a Machine Learning Algorithm that can reduce the time and cost of final product to the market.

Major learning outcomes: Learnt to work with never ending motivation. Learnt the etiquette of working in industry and maintaining a balance between work and life.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: ARM is a wonderful company to work with. People are very friendly and supportive. They are enthusiastic to work and help. One can maintain a good mental health without any major stress of work at ARM, as people (be it any senior officials) behave and talk very politely. There is work pressure but the way managers handle their sub-ordinates is outstanding. They talk, they ask if we are fine, they appreciate and they don't judge even for the minor doubts. I think this much support is enough to work enthusiastically in an organization. I saw patience in every employee I met at ARM and impressed by the way they support. One can seek help from anyone with no hesitation. I never felt as an intern, I was treated like a family at every monthly meeting. There was a team outing session that overwhelmed me with the enthusiasm and friendliness everyone carried. Overall it was great to work with ARM.

Academic courses relevant to the project: Yes, the academic courses set a base for further learning. Subjects like: VLSI Design, CAD for IC Design, VLSI testing and testability, Artificial Neural Network helped a lot in understanding the project.

Name: Shyam Krishnan K V(2018H1400123G)

Student Write-up

Short summary of work done during PS-II: Memory compilers are tools that can automate the creation of many different memory instances by abutted placement of pre-defined leaf cells. These are very complex and consist of more than a billion configurations / instances. Characterization is a process of generating timing / power / leakage / capacitances and variation data for the functional memory design. It is of increasing concern to SOC designers who require accurate and efficient models at all stages of design. With billions of configurations it becomes rigorously time and resource consuming to perform spice simulations on all of the instances. It thus, demands the need of reducing the number of simulations. There are techniques to reduce the number of simulations like for example, selecting a few instances and interpolate them. But these techniques are not satisfactory and we need something that can further reduce the number of simulations, maintaining a reasonable quality in a reduced cost. The aim of the project is to reduce the number of simulations in developing an artificial neural network incorporating Machine Learning that can be trained on a set of inputs (PVT) in order to predict the results for a new (PVT) set of inputs.

Tool used (Development tools - H/w, S/w): ETX turbo,Cadence virtuoso.

Objectives of the project: The main goal of the project is to reduce the number of simulations using machine learning concepts inorder to be cost effective, time saving, and improvement of efficiency.

Major learning outcomes: Machine learning and its application to perform neural network operations for effective reduction of cost, improvement of efficiency and time saving process.

Details of papers / patents: Nothing.

Brief description of working environment, expectations from the company: ARM embedded techonologies Pvt. Ltd., is semiconductor based organisation where we can explore and utilise the skills of VLSI domain concepts. It was very nice to work with ARM, a truely employee friendly company. All the co-workers were really supportive and they motivated me to acquire more knowledge and helped me to bring the best out of me.

Academic courses relevant to the project: Yes.

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

Faculty

Name: Naga V K Jasti

Student

Name: CHILLALE MOHAN REETHESH(2018H1430045H)

Student Write-up

Short summary of work done during PS-II: In the first half of my PS-II, I am assigned to do the feasibility analysis of automated testing tools. In that, I came up with a automation testing tool called Ranorex as the most feasible tool for OASys softwares (GSA, AdSec, etc.). In the second half of my PS-II, I worked in support system of OASys Structural. In which one should tackle the issue raised by the users which can be technical or software related issues.

Tool used (Development tools - H/w, S/w): Ranorex, GSA, AdSec, ADC, Compos, Visual Studio Professional 2019.

Objectives of the project: To select the best automation testing tool and to resolve the issue raised by the users.

Major learning outcomes: Got familiar with C language, C++, C#, HTML, able to script automated test modules, tackling software related and technical (Civil Engineering) issues.

Details of papers/patents: Report on feasibility analysis of automated testing tools.

Brief description of working environment, expectations from the company: Working environment is very pleasant to work. Staff in our office were very helpful and friendly. Company was expecting to create an report on feasibility analysis of automated testing tools, the one

which I successfully produced and helped the company to get maximum Return on Investment (ROI).

Academic courses relevant to the project: Advanced structural analysis, Dynamics of structures, Structural optimization, Finite element analysis, Bridge engineering.

PS-II Station: Atkins, Bangalore

Faculty

Name: Mahesh K Hamirwasia

Student

Name: HARSHITA SHARMA(2018H1300084P)

Student Write-up

Short summary of work done during PS-II: The project comprised of pavement maintenance and renewal works on the pavement sections for the highways England. Under the pavement design team, all the sections were investigated for the distress types, their severity, their treatment options were reviewed and material specification was done by polished stone value and aggregate abrasion value calculations. At last, pavement renewal drawings were prepared on the OS maps including the above information and pavement markings and studs.

Tool used (Development tools - H/w, S/w): S/w AUTOCAD PDS LINES AND PDS SIGNS, MS EXCEL.

Objectives of the project: To provide pavement renewal options and drawings.

Major learning outcomes: Experience on international projects.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: ATKINS offers a great work place with professional environment. Ample opportunity for career development. Really look to work with the organization in the near future.

Academic courses relevant to the project: Courses like highway geometric design, Pavement failure evaluation and rehabilitation had a good insight in the project.

PS-II Station: Atkins, Gurgaon

Faculty

Name: Mahesh K Hamirwasia

Student

Name: PRATHIK ANAND KRISHNAN(2018H1430048H)

Student Write-up

Short summary of work done during PS-II: Initially, R&D works on developing a software tool to design retaining walls. After finishing that, I was moved into assessment of post tensioned concrete bridges. Also, we were given steel form-work design review works of MTHL project (Mumbai Trans Harbor Link). Gained plethora of knowledge by working in these massive projects.

Tool used (Development tools - H/w, S/w): Python, Excel Macros, LUSAS, FEM, etc.

Objectives of the project: Python tool objective was to enhance in-house software capabilities. Then, objectives of PTSI and MTHL were to deliver quality design and assessment works.

Major learning outcomes: 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: Beautiful environment for any curious mind. There's a plethora of knowledge and opportunity right in front of you, its upto 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, Structural dynamics, Wind and earthquake engineering, Advanced steel structures, Bridge engineering, Pre-stress concrete, etc.

Name: ASHISH KUMAR JAIN(2018H1430068P)

Student Write-up

Short summary of work done during PS-II: The design of bolted connections for rectangular hollow sections, which is not mentioned in Eurocode hence the design was proposed based on other available research data.

PTSI, which is a special inspection of post tensioned bridges and is related to maintenance and strengthening of bridges as per British standard BD 54/15.

In MTHL project, design and review checks of temporary formwork of Pier head segments, pier cap, etc was performed.

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

Objectives of the project: To propose a connection design which can be used in further projects, if required. In PTSI, to assess the structure and provide suitable mitigation measures for defects. In MTHL, various design checks of temporary structures.

Major learning outcomes: While proposing the design of the bolted end plate connection for rectangular hollow sections, I was able to get familiarized with British standard EN 1993 – Eurocode 3: Design of steel structures, CIDECT design guidelines, SCI P398 and SCI P358. In the PTSI project, I learned the process of assessment of existing post-tensioned bridges, determining defects, and proposing mitigation measures to increase the life of the structure. In the MTHL project, I learned to check the detailed drawings and calculations of temporary formwork. This involved looking into British standard BS 5975, Indian standard IRC 87 and basic knowledge of the design of steel structures.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The organization is involved in a wider range of works and the employees have a 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 a really good work life balance.

Academic courses relevant to the project: Advanced steel structures, Design of post-tensioned concrete structures.

PS-II Station: Aurigo Software Technologies, Bangalore

Faculty

Name: Mohammad Saleem J Bagewadi

Student

Name: SANGAI SAMMYAK SACHIN(2018H1030092H)

Student Write-up

Short summary of work done during PS-II: First, we were given technical and product training for 3 weeks. I am a part of a team which dealt with bugs in the software on a sprint by sprint basis (a sprint is of 3 weeks). I also did some PBIs (adding features to existing product) which

included integrating third-party tools in C#, implementing sql procedures in reports etc. I was also involved in a UI/UX PoC (Proof of Concept) related to automated changes in rdl files.

Tool used (Development tools - H/w, S/w): C#, .Net, Javascript, CSS, Debugging, Visual studio.

Objectives of the project: To minimize the number of bugs in the existing project.

Major learning outcomes: 1) Understanding of how things work in the corporate world. 2) Experience involving intense teamwork. 3) Direct contributions and involvements in a flagship product instead of side projects. 4) Improvement in communication and presentation skills due to regular formal presentations with team members. 5) Experience what it is like working from home regularly (thanks to lockdown). 6) First-hand experience in debugging.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work-friendly environment. Team mates are very cooperative as well. Working hours are quite long.

Academic courses relevant to the project: Data structures.

Name: KHUSHAL GAHLOT(2018H1030097H)

Student Write-up

Short summary of work done during PS-II: Mostly working on live project of company product, Handling the bug and product backlog items.

Tool used (Development tools - H/w, S/w): c#,. Net, Visual studio.

Objectives of the project: Reducing the overall bugs in product and improving functionality.

Major learning outcomes: Development in .net framework, collaborative development of product.

Details of papers / patents: Company provides the software for infrastructure based fintech facilities.

Brief description of working environment, expectations from the company: Great working environment, fast paced, interns are treated equally and guided well.

Academic courses relevant to the project: C#,C++,OOPs, Data structures.

PS-II Station: Avaamo, Bangalore

Faculty

Name: Anita Ramachandran

Student

Name: RANADE SHUBHANKAR PRASAD(2016A7PS0099P)

Student Write-up

Short summary of work done during PS-II: Developed conversational AI agents for various industry verticals like Healthcare, Mutual Funds, Supply Chain, ITSM and CRM. Extended functionality of an application to route traffic between Avaamo platform backend and chat applications like Microsoft teams. Also, built a conversational notification manager as a proof-of-concept.

Tool used (Development tools - H/w, S/w): Node JS, AWS Lambda.

Objectives of the project: 1. Developing skills for common workflows in industries like ITSM and CRM 2. Extending functionality of application to manage traffic between chat platforms.

Major learning outcomes: Conversation design; development experience on a rapidly evolving platform.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: Since, Avaamo isn't a large company, you get to have lot of interactions with seniors and understand the impact of your work. People are helpful and open to conversations.

Academic courses relevant to the project: None.

PS-II Station: Axxela, Kolkata

Faculty

Name: Anjani Srikanth Koka

Brief write-up on each PS-II station: The below mentioned are the expectations from the industry in common apart from some specific skills in a student. A student can be better prepared by practicing these skills.

1. Exposure to marketing and finance course fundamentals
 2. Data analytics
 3. Proficiency in excel, python, R, SQL
 4. Soft skills
-

PS-II Station: B.G.Shirke Construction Technology Pvt. Ltd., Pune

Faculty

Name: Mahesh K Hamirwasia

Student

Name: ATHUL MAJEED(2018H1430071P)

Student Write-up

Short summary of work done during PS-II: Analysis, design of RCC and steel structures.

Tool used (Development tools - H/w, S/w): ETABS, SAFE, AutoCad, StaadPro.

Objectives of the project To understand and put into practice of the subject knowledge in an industrial environment.

Major learning outcomes: Analysis and design, IS codes, Commercial softwares.

Details of papers / patents: NIL.

Brief description of working environment, expectations from the company: It was a very good learning platform. There was good interaction with the mentors and colleagues. We get a chance to handle projects completely from the initial step to the very last step.

Academic courses relevant to the project: Design and analysis, IS codes.

PS-II Station: Balaxi, Hyderabad

Faculty

Name: Bharathi R

Student

Name: SHRIDULA SANKAR(2018H1080306P)

Student Write-up

Short summary of work done during PS-II: A pharmaceutical organization that files dossiers to the countries for the supply of drugs to different regulatory markets in the globe. The registration of a drug product in the emerging markets and the ROW markets is being done to make the drugs available. But here comes the challenge, where the drugs that has been registered is not available in the market on the date that is mentioned by the regulatory authority. This phenomenon is called as drug lag and this mostly occurs after the registration of drug in a particular market and then its non-availability. This project focuses on the factors mainly responsible for this lag, its reasons (manufacturer lag, application lag, regulatory lag and the drug lag thesis) and different regulatory strategies that can be used to minimize the drug lag, along with the non-regulatory strategies. The method that has been opted here is review of several regulatory information from websites of regulatory agency and past experience from the organization. In this project, my role is to see where the lag is caused to help our organization to get involved in the process on the main focus points, to avoid the lag.

Tool used (Development tools - H/w, S/w): No development tools were used.

Objectives of the project: Knowing the reasons of drug lag in a particular market, reasons for the regulatory authority to create a drug lag, Intentional hikes created by the innovators, how regulatory authorities are bound to create the lag.

Major learning outcomes: How the pharma companies work during the registration of their drugs in the different countries and in response how government regulatory authorities of different countries respond to these filings (dossiers). Main outcome is to tackle this queries and

register the products in the given time so that the drug is available to the patients without any lag.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is enjoyable and I like going to work and feel appreciated, acknowledged and rewarded. Creativity, productivity and thinking outside the box flourish. Expectations are not high from the company. It is best the way they have molded the company for interns and new employees.

Academic courses relevant to the project: Few of the academic courses in the pharmacy field like Quality Assurance and Regulatory Affairs (QARA), Advanced Physical Pharmaceutics (APP), Instrumental Methods of Analysis (IMA) and much more subjects.

Name: GOLANDE SHUBHANGI VILAS(2018H1460242H)

Student Write-up

Short summary of work done during PS-II: The project was mainly based upon 'regulatory requirements for lyophilized parenteral products and drug-device combination in US and Latin America. The USA and Latin America are two different regions that are focused on this project. Latin America comes under non-regulated market authorization which does not have specific regulations of its own but the regulations are derived from different countries' authorization like Europe, Brazil, WHO, etc while the US market follows guidelines established by FDA. While on this topic mainly specifies regulations in Latin American countries and the USA for parenteral products and combination products and how the guidelines vary in both the countries. The changing regulatory landscape in Latin America and the USA also affects the product development and approval process. It includes the regulations for both parenteral and combination products in Latin America and the USA and the queries regarding the same.

Tool used (Development tools - H/w, S/w): Microsoft office 2007, Microsoft excel, power point presentation.

Objectives of the project: 1.To study regulatory guidelines for parenteral and drug device combinations in US and Latin America 2.To study the challenges in filing these products in USA and Latin American markets 3.To understand drug recall procedures from Latin America and USA.

Major learning outcomes: The regulatory landscape of both the countries is different with respect to pharmaceutical drug discovery and product approval. The US market is most harmonized and stringent as compared to non-regulated markets like Latin America.

Learning outcomes are as follows,

- o Regulatory landscape of both countries
- o Process for approval of drugs in both countries
- o Recall procedures and queries regarding it
- o Challenges in the regulated as well as non regulated market for filing of drug substances and drug products.

Details of papers / patents: The manuscript is under process of edit.

Brief description of working environment, expectations from the company: Balaxi overseas has a pleasant working environment. The organization is small in the hierarchy, so there was good interaction with everyone. My mentors were very helpful and experienced in their respective fields which helped me to complete this project through their learning. I learned a lot about Latin American markets and the process of drug product regulation. The experience in the organization was good.

Academic courses relevant to the project: Quality Assurance and Regulatory Affairs.

Name: KANDERWAR MANOJ(2018H1460248H)

Student Write-up

Short summary of work done during PS-II: Worked on project Regulatory Landscape of Biosimilars in Latin America. Worked on preparation of technical documents for approval of medicinal products.

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

Objectives of the project: Regulatory Landscape of Biosimilars in Latin America.

Objectives 1.To provide an elaborative description of biologics and biosimilars.

2.To identify the challenges faced for biosimilars product registration.

Major learning outcomes: Able to prepare a technical dossier documents for registration of medicinal products for their approval.

Details of papers / patents: Regulatory Landscape of Biosimilars in Latin America.

Brief description of working environment, expectations from the company: Working environment: Regular feedback on performance, resource sharing, challenging work, continuous learning.

Expectations: Job will be motivating, rewarding, safe and conducive working environment, opportunities for career and personal development.

Academic courses relevant to the project: Quality Assurance & Regulatory Affairs, Dosage Form Design, Pharmacokinetics & Pharmacodynamics.

PS-II Station: Bharat Forge Ltd, Pune

Faculty

Name: Naga V K Jasti

Student

Name: GOSAVI ABHISHEK VARSHAV(2018H1060158H)

Student Write-up

Short summary of work done during PS-II: We were allocated PS at their IIOT R&D department. There, we were told to work on automating a NDT process called MPI used to identify defects in forged components. Objective of this project was to design a system which will use computer vision to replace a traditional operator based M.P.I system. In the available time, we were able to partially achieve the design which can be used to detect the surface defects on a shaft. My contribution in the project was designing and creating a CAD model of a system which can be used for the image acquisition of the forged component and these images will further be used as a input for the computer vision algorithm to detect defects.

Tool used (Development tools - H/w, S/w): CREO, Ansys structural module, Ansys transient module.

Objectives of the project: Objective of this project was to design a system which will use computer Vision to replace a traditional operator based M.P.I system.

Major learning outcomes: Problem solving with help of the available resources, how to work more efficiently.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment was quite supportive in the department and they were encouraging us to learn new technologies. Also for our learning purpose, they allowed us to attend the discussions related to the other ongoing projects in their department.

Academic courses relevant to the project: Product design and development, Basic concepts of mechanical engineering, Robotics.

PS-II Station: Blue Yonder (JDA), Hyderabad

Faculty

Name: Chennupati Rakesh Prasanna

Student

Name: TEEGALA JAYAKANTH(2016A8PS0421H)

Student Write-up

Short summary of work done during PS-II: As IKEA wanted a full mobile and personalized version of the ESO application, our team is developing APIs for those requirements and testing them. ESO has different rest APIs under organisation, inventory management, item management, supplier management, financial management, food management, fuel management system, merchandise management & pricing management. And different requests as POST, PUT, GET & DELETE. Tested major part of application, rest APIs developed.

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

Objectives of the project: Testing APIs of the product.

Major learning outcomes: Javascript, Postman Software.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Two-way communication among every employee. Managers and co-workers are available all the time. Training programs on variety of skills like Yoga, team building etc. everyone has their work-life balanced. Managers are always concern about the team's work-life balance. No work goes unrecognized.

Academic courses relevant to the project: None.

PS-II Station: BNY Mellon Technology, Pune

Faculty

Name: Sonika Chandrakant Rathi

Student

Name: VAISHNAVI KHARIYA(2016A8PS0416H)

Student Write-up

Short summary of work done during PS-II: Worked with the UI team of navigator application. Worked on adding new components in the application, enhancing the performance of the application in terms of load time, build time, responsiveness. Designed the view of certain screens in the application. Worked on an automated Java code formatter.

Tool used (Development tools - H/w, S/w): HTML, CSS, JavaScript, Angular 8,9, Maven, GitLab CI/CD, Visual studio code.

Objectives of the project Upgrade the UI as well as the performance of the application.

Major learning outcomes: Worked on new technologies like Angular 9, GitLab CI/CD and got familiar with new tools like Maven.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The entire team was very supportive and helped me in both work as well as in adjusting to a new place. I was given work that was challenging as well as helped in learning new things every day.

Academic courses relevant to the project: Software engineering.

PS-II Station: Bundl Technologies Private Limited (Swiggy) - Nontech, Bangalore

Faculty

Name: Srinivas Kota

Student

Name: AAYUSH BHAGLAL(2015A4PS0196G)

Student Write-up

Short summary of work done during PS-II: Worked with the monetisation team to start a new consulting service for our partner restaurants. The work involved operations, analytics, process definition and automation.

Tool used (Development tools - H/w, S/w): Microsoft excel, SQL, PowerBI, Python, Google apps scripts.

Objectives of the project: To start a new consulting service in order to help the under performing restaurants on the platform grow bringing in money for Swiggy at the same time.

Major learning outcomes: Learnt people management skills and tools like Excel, SQL, PowerBI and Python.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Swiggy is a great place to work. Being a startup, the learning curve is really steep and we needed to work really hard for the first few months in order to get comfortable with the work.

Academic courses relevant to the project: Probability & statistics, Supply chain management, Technical report writing.

Name: PARIKH CHIRAG HITESH(2015B1AB0520P)

Student Write-up

Short summary of work done during PS-II: Worked on discount campaign planning & performance. Performed budget planning, allocation & performance measurement for monthly discount campaign, as well as worked on different discounting products & their impact on various business metrics.

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

Objectives of the project: Improving spends efficiency & ROI from various discounting campaigns & products.

Major learning outcomes: Improved ownership skills, stakeholder management, budget allocation, time management, presentation skills, analytical skills.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment in the company is really positive. The people in the organisation are really helpful & give interns their time to learn and work on the problems. Working in swiggy has been a real learning experience with great intellectual minds around me.

Academic courses relevant to the project: POE, POM.

Name: PALAPARTHY ADITYA SAI SRIKANTH(2015B5A30693H)

Student Write-up

Short summary of work done during PS-II: I worked in the new supply - Ops division of swiggy. My team took care of the daily operations of swiggy cloud kitchens. Most of my work involved analyzing the processes implemented in the kitchens and trying to produce ways to improve these processes. Major projects I was given involved analyzing and trying to reduce the complaints by customers.

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

Objectives of the project: Complaints.

Major learning outcomes: Operations management, Supply chain management, Analytical skills, Problem structuring and Problem solving skills.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The work environment is very good. Everyone around is approachable and are always ready to help you. You will be given real time projects even though you are an intern and the analysis you make will also be presented to higher ups in the organization. All teams know that you are from an engineering background, so they do not expect you to know the analysis techniques etc., but once you join you are expected to learn and develop the skills required quickly. Your mentors will spend time with you and make sure you understand the context i.e. why you need to do a project and the skills needed for the project. They also teach you some analytical techniques that you need to finish your project.

Academic courses relevant to the project: POM.

Name: MONARK MOOLCHANDANI(2015B5AB0682H)

Student Write-up

Short summary of work done during PS-II: I was in the operations strategy team of new supply business. It comprises of private brands (homely, bowl company etc) & access kitchens. My work was majorly towards developing a new product for central kitchen & handling project management for an ongoing ERP software transition. It involved data management & sourcing different resources from multiple stakeholders. I also got to work on a forecasting model (ARIMA) used to avoid stock out in satellite kitchens.

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

Objectives of the project: To reduce cost of goods sold, cost of labour by transitioning to new software (LS Retail).

Major learning outcomes: 1. Project management 2. Product development lifecycle 3. Stakeholder management 4. Operations management.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: It's a good place to be, team members help you learn & grow. The peer group was from tier 1 B schools, so the way things work are very professional & time bound. It's a good place to work at in learning years.

Academic courses relevant to the project: Supply chain management, Lean management.

Name: NANNURI SRIJA(2016ABPS0685H)

Student Write-up

Short summary of work done during PS-II: My day to day work revolves around monitoring business metrics of swiggy genie and reporting of root cause analysis of growth / degrowth observed to the leadership in order to enable them to make necessary strategic decisions. I also

took part in devising out effective pricing strategy and also in projecting orders for future months, which would help in budget decisions.

Tool used (Development tools - H/w, S/w): SQL, Microsoft-BI dashboards, MS EXCEL.

Objectives of the project: Strategic decision making and regular monitoring of business performance.

Major learning outcomes: Got an understanding of how a startup service line works. Since, swiggy genie consists only 15 team members, all the leadership decision making was transparent and gave us an opportunity to learn.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Team mates are helpful and reachable, consistency and 100% availability is a major expectation in a startup service line like this.

Academic courses relevant to the project: Supply chain management, Operations research / optimization, Manufacturing management, Strategic management.

Name: IRIGINENI SAI HARSHINI(2016ABPS0698H)

Student Write-up

Short summary of work done during PS-II: My work included week, month level RCAs, business forecasting and different analysis on swiggy metrics for developing strategies for post covid action plan.

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

Objectives of the project: Understanding the strategy team functions, RCA of swiggy business.

Major learning outcomes: Organisation functioning during a pandemic, hands on experience in strategy development and corporate exposure, working with team.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: I worked for central business team in swiggy and they were very welcoming and supportive. The energy of the team has always been high, motivating me to learn and aim for bigger things.

Academic courses relevant to the project: Supply chain management, Manufacturing management, Technical report writing.

PS-II Station: Bundl Technologies Private Limited (Swiggy) - Tech, Bangalore

Faculty

Name: Ritu Arora

Student

Name: RAJAT GUPTA(2016A7PS0023G)

Student Write-up

Short summary of work done during PS-II: I was a part of the trust and safety team (TNS) which is responsible for the prevention of fraud and abuse from happening on the swiggy platform. I worked on a couple of projects, titled Restaurant Anomaly Detection and CAFE UI. While the former was focused towards building a data science model for reporting anomalies in the restaurant stack, the latter was on building a UI for one of the central services called Central Abuse Fraud Engine (CAFE) of TNS.

Tool used (Development tools - H/w, S/w): Python, Javascript, HTML, CSS, Bootstrap, Jupyter Notebook, Qubole, Django.

Objectives of the project: Identify and detect anomalies on the restaurant stack.

Major learning outcomes: Got a good exposure of the following tech stack, Front end development, Data science methodology, Machine learning, Test driven development.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Good working environment, flexible working hours, good projects.

Academic courses relevant to the project: Machine learning, Data structures and algorithms.

Name: RAJAS KEJRIWAL(2016A7PS0045G)

Student Write-up

Short summary of work done during PS-II: Developed a micro-service that calculates and publishes capacity management metric used in deliveries.

Tool used (Development tools - H/w, S/w): Go, Apache Kafka, Redis, Git, SQL, API, gRPC, Docker.

Objectives of the project: Developing a microservice in Go.

Major learning outcomes: The various tasks and projects I've done so far have helped me gain a good understanding of how software engineering is done in the industry. I've learnt various new tools and technologies while working on these tasks as well as refreshed some

concepts and ideas that were learnt in college. The experience gained here, working closely with industry professionals will definitely help me in my future endeavours.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Friendly and encourages growth and learning.

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

Name: SHAH NEEL KAUSHIK(2016A7PS0076P)

Student Write-up

Short summary of work done during PS-II: 1. Development, operations and maintenance of text-to-SQL NLP service.

2. Design and development of an organization-wide data governance service.

3. Tasks on other services owned by my team.

The projects came with a complete sense of ownership and responsibility. I was involved in the projects from design to deployment, was given charge of daily operations and maintenance and had the freedom to explore various solutions at each step. The icing on the cake was seeing my projects in action, as part of a larger software stack.

Tool used (Development tools - H/w, S/w): Python, Golang, NodeJS, Java, Docker, Kubernetes, MySQL, Snowflake, Qubole, Elasticsearch.

Objectives of the project: To build and maintain an NLP service. To design and build a data governance service.

Major learning outcomes: Software development, Design principles, working in a corporate environment.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The work is very hands-on and involving. My team members were extremely friendly and helpful.

Academic courses relevant to the project: Cloud computing.

PS-II Station: BuroHappold Engineering, Mumbai

Faculty

Name: Pavan Kumar Potdar

Student

Name: SHIVARAJ KASHINATH PANIGAVI(2018H1430055H)

Student Write-up

Short summary of work done during PS-II: I was immediately added in a live project of a G+20, 6-tower residential building situated in Bangalore. The work involved everything: Footing, beam, column, wall analysis and design according to IS code provisions. I learnt a lot in a very short amount of time.

Tool used (Development tools - H/w, S/w): CSI ETABS and SAFE.

Objectives of the project: To analyse and design economical and safe residential towers for the client Godrej w.r.t IS codes and NBC.

Major learning outcomes: Analysis and design of different building elements.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment is really very hectic and the deadlines are very tight. They expect you to be well versed in software's and civil engineering designs. You really need to step out of your comfort zone, deliver and learn simultaneously.

Academic courses relevant to the project: Advanced structural analysis, Advanced RCC, Prestressed concrete design, Design of multistory buildings.

PS-II Station: CACTUS Communications - Product Analysis, Mumbai

Faculty

Name: Pravin Yashwant Pawar

Brief write-up on each PS-II station: Software industry is being transformed by two waves - First one with respect to the development and usage of software applications for the emerging fields like AI, ML, IoT and analytics. Second one with respect to the manner in which software development and associated activities are carried out - to name it like full stack engineering. If the students are introduced with the new edge, complex software systems architectures along with the technology / platforms that helps in building such complex products, that will make them more industry ready or otherwise they need to spend a lot of time in understanding these complexities involved and are left with very less time to work upon them. As analytics is driving a lot many product innovations, the hands on knowledge of applied machine learning (rather than focusing only on the mathematics behind it) will be more appreciable in industry as it will reduce the learning time of intern to understand those use cases & its applications resulting into more opportunities to do meaningful contributions to the products innovations rather than just doing some routine software development work.

Student

Name: ANUSHA GUPTA(2018H1490336P)

Student Write-up

Short summary of work done during PS-II: I joined Cactus Communications as a product analyst for my PS-II and it has been a great learning experience. During my entire internship, I got the chance to work closely with the entire product team. My main role was to analyze the Cactus's main product- Editage and to identify the major factors that affect the revenue of the business and customer behavior. I got the exposure in SQL, data interpretation and visualization, dash-boarding, Google analytics and to handle the complex and large data. Being an experienced candidate, i still get a very good support from the team specially from my mentor who always guided me at each and every step and handle all the queries patiently. On the top of that, the work culture of the company is amazing that completes the definition of "Fun + Innovation + Integrity".

Tool used (Development tools - H/w, S/w): Google analytics, Advanced Excel, 3rd party dash-boarding tool.

Objectives of the project: The objective of this project is to assist product managers in evaluating the impact of the Editage 2.0 on the customer behaviour and how it has impacted on overall revenue of the business. From the data, we will be able to identify that what factors are involved.

Major learning outcomes:

- SQL
- Draw insights from the raw data
- Understanding of customer behavior depending on different markets
- Data visualization
- Data interpretation
- Building compelling dashboards
- Google analytics (Basic)
- Remote working

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment of Cactus Communications is not less than any top company environment. Cactus

exceeds all the expectations of employees by providing not only work life balance, flexible working hours but also various exciting events. One of the most important thing that I love about company is sharing of the vision every quarter and year with each and every employee to make sure that everyone is clear about their goal and should align with the business goal which I feel that is missing in many organization. Working in Cactus has given me immense satisfaction in terms of working environment and expectations from the company.

Academic courses relevant to the project: My core work was related to Analyst and SQL which was not covered in any of the courses in MBA. However, communication and BSP course helped in terms of business communication.

Name: PINDIPROLU LAKSHMI SINDHU(2018H1490366P)

Student Write-up

Short summary of work done during PS-II: The product analyst role at Cactus Communications mainly involved assisting a team of product managers in retrieving required data across multiple data sources and analyzing the trends. This analysis was used by the product managers in taking critical decisions regarding certain features and business as a whole. In the course of the internship, I worked on the Project - 'Analyzing the performance of Editage 2.0 and its impact on the business'. For this, I created a trends dashboard which is the baseline that track all the KPI's of the business for 4 Markets viz. Japan, China, Korea and ROW (Rest of the World). Once Editage 2.0 was launched, I tracked it's performance against the trends dashboard. In addition, I have also evaluated the impact that Editage 2.0 had on the business.

Tool used (Development tools - H/w, S/w): Redash- Datum for querying, Google analytics.

Objectives of the project: Analyzing the performance of Editage 2.0 and it's impact on business.

Major learning outcomes: Developed problem solving skills. Learnt retrieving data from huge data sets and analyzing trends of the data which gave a clear picture into the field of data analytics.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Cactus Communications is an employee-centric company. The work environment here is highly conducive for learning and development. The product team has been supportive in the entire course of internship. The interns were also given equal responsibilities to that of the full time employees. Having worked for an MNC prior my MBA, I observed many differences in the work environment in Cactus Communications. The organization is highly transparent and the voice of each employee is respected here.

Academic courses relevant to the project: None.

PS-II Station: CACTUS Communications - Product Management & Software Dev., Mumbai

Faculty

Name: Pravin Yashwant Pawar

Student

Name: DA SILVA JOSEPH FRANCISCO(2016A7PS0282G)

Student Write-up

Short summary of work done during PS-II: Worked on the following projects,

- Browser compatibility checker for TypeScript: Checks TS code for compatibility with a given list of supported browsers and browser versions. Integrates with the VS Code IDE so that any issues detected appear as warnings in the editor.

- Custom Angular schematics: Automating common development tasks involving creation of new files with skeleton code.
- Smart URL routing library for Angular applications: Detects mistyped URLs and provides an error page with suggestions or automatically redirects to the correct page.
- Analytics and logging library for Angular applications: Provides a unified API for reporting analytics events from applications to service providers (Google Analytics, Facebook etc.).
- Dynamic form generator: Generates dynamic web forms from JSON-based models.

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

Objectives of the project: To develop browser compatibility checker for TypeScript, Custom angular schematics and applications.

Major learning outcomes: Web application frameworks, single-page application (SPA) architecture, dependency injection as a software design pattern, static code analysis, design of library APIs, how code is managed in business environments (use of Git version control system, continuous integration), importance of code quality and testing.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: A flexible and employee friendly working environment. Highly dynamic technology team willing to adopt the latest technologies. Expectations are high when it comes to the quality of the work done.

Academic courses relevant to the project: Object Oriented Programming.

PS-II Station: CEG Limited, Jaipur

Faculty

Name: P Srinivasan

Student

Name: GONE ASHISH LAXMIKANT(2018H1430070P)

Student Write-up

Short summary of work done during PS-II: I was working on designing of prestressed girders.

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

Objectives of the project: Optimisation of design of box girders.

Major learning outcomes: Prestress design.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Employees here are helpful.

Academic courses relevant to the project: Prestress concrete structures.

PS-II Station: Central Electronics Engineering Research Institute, Pilani

Faculty

Name: Pawan Sharma

Student

Name: Vaibhav(2016B5PS0975P)

Student Write-up

Short summary of work done during PS-II: The department allocated to me is plasma device. My work is to construct plasma brush which is used dental treatments. For doing it, I had gone through the literature to understand its concept and for experiments I have learnt the software for simulation and devices usage in my experimental work and performed the experiments for its analysis.

Tool used (Development tools - H/w, S/w): Oscilloscope, flow meter, high voltage probe, gas cylinder operation, high voltage power supply.

Objectives of the project: Analysis of plasma brush.

Major learning outcomes: I have learnt to operate many types of devices used in experimental works.

Details of papers / patents: In this study research papers of plasma brush are used.

Brief description of working environment, expectations from the company: Working environment is good.

Academic courses relevant to the project: Electromagnetic theory, atomic and molecular physics and plasma physics.

PS-II Station: Central Leather Research Institute (CLRI), Chennai

Faculty

Name: Glynn John

Student

Name: DUSANE APURVA CHANDRASHEKHAR(2018H1460239H)

Student Write-up

Short summary of work done during PS-II: I worked on the development of haloperoxidase mimetics to combat biofouling and other potential medical applications. In this, I developed a nanozyme which is basically an inorganic nanocomplex with enzyme mimetic activity; based on the material used for synthesis of the nanomaterial as well as its morphology the enzymatic activity changes. The nanozyme I developed was dual functional with haloperoxidase as well as oxidase activity. This activity took almost seconds to exhibit and was deemed to be beneficial against biofilms observed on surface of medical devices, biofouling observed at the base of ship hull as well as useful as an inorganic antibiotic therapeutic agent. This nanomaterial was characterized further by Powder XRD and Transmission Electron Microscopy; we also validated its haloperoxidase as well as oxidase activity using kinetic experiments that I designed and determining their K_m values. Simultaneously, I also worked on a review on COVID-19 with a team of virologists.

Tool used (Development tools - H/w, S/w): OriginPro8.5, UV-Vis chemstation software, EndNote7, EndNote9, Reaxys.

Objectives of the project: Cost-effective, least toxicity and robust approach to combat biofilms, biofouling and antibiotic application.

Major learning outcomes: > Learned bio-inorganic chemistry and its interdisciplinary approach towards healthcare industry.

> Learned to design experiments.

> Learned various softwares such as OriginPro8.5, UV-Vis chemstation software, EndNote7, EndNote9, Reaxys.

Details of papers / patents: Proposal for review article has been submitted.

Brief description of working environment, expectations from the company: There is a lot to learn from these scientists, each and everyone is very meritorious with their credentials in their respective fields. The Ph.D and Postdoc students are very helping, you'll get to learn a lot and have many relevant scientific discussions with different view points. There are generally events held at CSIR where they invite many reputed scientists, if you're keen enough you can approach them and learn something interesting from their field of expertise.

Academic courses relevant to the project: Instrumental Methods of Analysis and Advanced Physical Pharmacy.

Name: PANCHAL DHARUVISHA SURESHBHAI(2018H1460240H)

Student Write-up

Short summary of work done during PS-II: The novel supramolecular hydrogel was prepared using low molecular weight compounds such as amino acid. Suitable characterization methods were performed. Interestingly, the prepared hydrogel exhibited selective anti-microbial activity against gram-positive bacteria. Apart from biological activity, the syneresis property of hydrogel was also allowed us to prepare the hydrogel with host molecule such dyes as toxic materials present in the industrial wastewater.

Tool used (Development tools - H/w, S/w): AFM, CD, FT-IR, HPLC.

Objectives of the project: To prepare supramolecular gel from low molecular weight compounds such as aminoacids and explore potential use of prepared aminoacid supramolecular gel in various fields.

Major learning outcomes: Ability to design and develop formulations. Ability to perform physico-chemical characterization of the prepared formulation. Learned the operation of various

instruments. A thorough idea about the low molecular weight compounds used to develop the formulation.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: CSIR-CLRI is an excellent place for learning and research. The working environment was motivating and amicable. Scientists and research scholars were easily approachable. Every day you get to learn something new. Your work was recognized and appreciated well.

Academic courses relevant to the project: Instrumental methods of analysis, Advanced drug delivery system, Advanced physical pharmacy.

PS-II Station: Cisco Systems (India) Pvt. Ltd - Software Engineering, Bangalore

Faculty

Name: Raja Vadhana P

Student

Name: SHIVA TRIPATHI(2014HS400401P)

Student Write-up

Short summary of work done during PS-II: Demonstration of POC (proof of concept): OTN switching implementation of NCS1004 router. It involved working on the XR IOS - network operating system of Cisco for its routers and a line card application which runs on the intel FPGA's. Got to know the different layers of XR and the way it interacts with the lower layers of hardware (FPGA). On the line card application, implemented the FPGA related slice and graphs details. Got to know the optical domain of networking in depth including the OTN protocol. Also worked on memory related issues in embedded systems using a tool called valgrind under GNU.

Tool used (Development tools - H/w, S/w): Valgrind (GNU), XR IOS (Cisco OS), NCS1004 platform (Cisco), Line card application (developed by Cisco used for Intel FPGA's).

Objectives of the project: To demonstrate a proof of concept: OTN switching implementation of NCS1004 router.

Major learning outcomes: Network operating system (XR IOS), Memory issues debugging using valgrind, NCS platform routers of Cisco, Optical networking concepts.

Details of papers / patents: No, project might be useful for Cisco's future product development feature.

Brief description of working environment, expectations from the company: Very friendly and easy to approach team and higher management. Regular meetings with manager and mentor made the learning process comfortable. Focus was given on my learnings rather than completing the projects on deadlines. Flexibility to switch project was also provided.

Academic courses relevant to the project: Device drivers (in ref to Linux), Embedded system design, Reconfigurable computing (some basics of FPGA architecture).

Name: PRIYANSHU JAIN(2015B4A70379G)

Student Write-up

Short summary of work done during PS-II: My main area of work was related to data visualisation. I worked on Email threat reporting and analytics. I created a sankey chart which showed the complete mail flow pipeline of any incoming mail passing through Cisco Email Security Appliance (ESA). Further analysis of the chart was also done to suggest / recommend changes in policy configurations for the end user.

Tool used (Development tools - H/w, S/w): D3 Javascript Library, MS Excel.

Objectives of the project: Analyse and report Cisco ESA's customer traffic data.

Major learning outcomes: Improvement in data visualisation and analysis skills. I also learnt D3 Javascript library which is very useful to create various interactive graphs / charts.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The workplace is very good. Culture of the company is awesome. There is a good work-life balance. Regular events were also organised to make the internship experience exciting. All the necessary facilities were provided and colleagues are really helpful.

Academic courses relevant to the project: Data structures and algorithm.

Name: ARCHIT MITTAL(2015B5AA0620H)

Student Write-up

Short summary of work done during PS-II: Made a chatbot for integrating different domains of department onto a single platform. Also, did full stack web development to make a platform to ease query result fetching for the department people easy.

Tool used (Development tools - H/w, S/w): Python, flask, html, css, javascript, ML.

Objectives of the project: To integrate different platforms to a chatbot and to develop a full stack website to ease tasks of users in department.

Major learning outcomes: Learnt to develop a chatbot with a supervised learning model
Got practical exposure of theory learnt in ML course
Writing a scalable and optimized code
Learnt using API, making requests and writing regex
Learnt integration of Frontend + Backend + Database

Writing optimized algorithms

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment was good. The expectations of manager were to be kept in mind. There was no strictness on time but tasks were expected to be completed.

Academic courses relevant to the project: ML, DBMS, DS.

Name: PRAKHAR JAIN(2016A7PS0047H)

Student Write-up

Short summary of work done during PS-II: Deployed Intersight Onprem on a VM and set up ELK stack on it, configured filebeat to send logs directly to ElasticSearch cluster, designed the basic workflow and implemented the code for log analyser, tested log analyser's API calls through postman, performed unit testing using Go test and Gomock libraries.

Tool used (Development tools - H/w, S/w): Golang, ELK stack, Docker, Kubernetes, Postman, Bitbucket.

Objectives of the project: Cisco Intersight contains multiple microservices which generate multiple logs based on the flow of execution. It can get very difficult to trace the source of an error or even the path a particular execution took, just by looking at the logs manually configured.

Major learning outcomes: Software development, Testing.

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, Data structures and algorithms.

Name: VIVEK PRATAP DEO(2016A7PS0056H)

Student Write-up

Short summary of work done during PS-II: As a part of intersight team, implemented the NFS (Network File System) based download for the server upgrade and make changes in the existing workflow to trigger the firmware upgrade in the server.

Tool used (Development tools - H/w, S/w): Network File System, Scp commnds, Golang, Xml, Json.

Objectives of the project: Provide an alternative way for firmware download via NFS.

Major learning outcomes: Networking, Golang.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is great. Work hours are flexible.

Academic courses relevant to the project: Networking , DSA.

Name: ARVETI SHIVA UMA MADHUR(2016A7PS0127P)

Student Write-up

Short summary of work done during PS-II: Parsed LSA database and created a graphical view of the database.

Tool used (Development tools - H/w, S/w): Java Script, PHP.

Objectives of the project: To create a tool to visualize network topology using LSA database.

Major learning outcomes: In depth OSPF protocol, Segment routing.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Work area is very friendly, healthy work hours, should know basic network protocols.

Academic courses relevant to the project: Computer networks.

Name: BANSAL ISHAN LALIT(2016AAPS0164H)

Student Write-up

Short summary of work done during PS-II: The tasks assigned to me was primarily automation tasks to reduce the leg work being done by the Quality assurance team. The first task was to automate the process of checking test scripts for compliance and making sure they contained all information regarding the nature of the script and the conditions under which it is executed. The next task needed us to develop two hooks which can be executed once the test scripts are merged with the master codebase where the script's metadata is inserted into a remote SQL database and the status of the test case is changed in the in-house test case tracker. The third task was to make a web-application that could be used to review the progress

being made in the development of test scripts over the past weeks with a UI that could display differential data and highlight the progress made over 12 weeks (or 3 months). For the fourth task, we developed a fully automated web-tester that could recurse through the products' entire graphical user interface (Intersight website) and identify problems and security flaws. Next, we have developed a user interface which can obtain data relating to the test failures of intersight regression runs from a mongoDB and display it on an easy to understand dashboard. Finally, we developed an in-house chat-bot to improve the reporting efficacy. The chat-bot has been critical in reducing the time gap between request and response time for all Quality assurance engineers. It has also helped automate the process of finding runs and failures for different test suites.

Tool used (Development tools - H/w, S/w): Python, MySQL, Flask and Selenium, GIT.

Objectives of the project: Automation and CI / CD pipeline build.

Major learning outcomes: Importance of automation, writing development code, continuous maintenance and enhancement , CI / CD pipelining for agile delivery.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Good, positive working environment. Intelligent team members. Good trust and vision shown by the manager. Entrusted responsibility without hesitation. The work expected has to be top notch and needs to be delivered in a timely fashion. The deadlines were hard but realistic. Overall, a fine learning experience to be working with the team.

Academic courses relevant to the project: Computer programming.

Name: PUSHKAR GUPTA(2016AAPS0204H)

Student Write-up

Short summary of work done during PS-II: Adding features to support multiple debug destinations so that a user can configure one of these based on his requirements along with multiple features inside each of these destinations along with updating configurations of each of the existing services caused by the new destination support. Things I learnt include understanding various aspects of computer networking and security by working on state of the art Cisco firewalls, technology used in the project C, Perl, Clish, Yaml, xml and writing industry standard clean codes.

Tool used (Development tools - H/w, S/w): C, Perl, Splunk.

Objectives of the project: Connection based debugging (or conditional debugging) is an infrastructure which is introduced in FTD that helps a user configure filtering options to confine the volume of debugs while troubleshooting an issue. It helps filter traffic based on 5 tuple i.

Major learning outcomes: Understanding how to write clean industry standard codes and learning various features of Cisco propriety firewalls mainly the FTD along with witnessing the real world impact and use of these firewalls for cybersecurity.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Cisco is one of the leading organisations in the field of networking hardware and software and is great place to work for understanding and creating a career in computer networking.

Academic courses relevant to the project: Computer networking, Operating systems, C programming.

Name: NAGA DIGVIJAY KUMAR GURUVELLI(2018H1030105H)

Student Write-up

Short summary of work done during PS-II: Syslog is a protocol defined in the RFC 5424, its used to log a device's event messages to a server for storing its state through which we would know what has happened within a system. For an administrator to manually read through all these log records it would be a very tedious task incapable for a human being. By developing an algorithm with learning capabilities issues such as, identifying the abnormal logs, linking incidents can be done much faster and also the algorithm could be modelled to help in predicting the future failures which could happen in the devices which are logging these messages. In summary to reduce the MTTR (Mean Time to Repair) in case of a failure or imminent failure in the network.

Tool used (Development tools - H/w, S/w): Machine Learning, NLP, Statistical tests, Python/R Languages, Splunk.

Objectives of the project: The project's objective is to design intelligence which will aid engineers in pinpointing and understanding with a greater ease on what is happening within their networks.

Major learning outcomes: How an end-to-end analytics dev and deployment pipeline is done, and a lot more useful tech / etiquette learnings.

Details of papers / patents: In the process of filing a patent.

Brief description of working environment, expectations from the company: I was interning in the D&A org of Cisco, the team which I was part of kept my spirits and interest higher and growing everyday for the project. There was always some exciting work to do, also the student's curiosity and ideas were always nurtured and listened to by the team. Cisco provides ample time to learn and up skill in areas where we are lacking as well as makes sure the projects we are working on are put into production.

Academic courses relevant to the project: Advanced data mining, Artificial intelligence.

Name: G ASHWIN(2018H1120266P)

Student Write-up

Short summary of work done during PS-II: The work comprised of proper assessment of incoming calls to understand whether the IP address from where a call is coming is from a legitimate user or from a spammer.

To prevent and detect spam calls from affecting important meetings, the following steps have been considered,

- Write a real-time streaming program to extract and analyze relevant data from incoming events
- Generate a notification whenever an IP address is deemed as potentially spam IP
 - o Compute threshold for different times for events coming from an IP
 - o Data will be artificially fed to the streaming job
- Create a blacklist for spammers and whitelist for valid customers

Tool used (Development tools - H/w, S/w): Apache Flink, Docker, Jenkins, Scala, Pyspark.

Objectives of the project: To prevent and detect spam calls.

Major learning outcomes: Understood the functioning of a full data pipeline along with CI/CD aspect.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Everyone in the team was very friendly, people are willing to help when needed. Just like any other company, we are expected to complete the tasks we are given. Webex meetings are used to collaborate and keep up with current status of work.

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

Name: GHETIA NIMMI GOVINDDAS(2018H1120276P)

Student Write-up

Short summary of work done during PS-II: Learned angular, git, scrum model, cicd pipeline and rest apis.

Tool used (Development tools - H/w, S/w): Spring Suite, VS Code, Mysql workbench.

Objectives of the project: Creating a portal for cisco partners for easy access to resources.

Major learning outcomes: Learning agile method, code reviews and understanding features.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: Company involved us in the daily stand ups, updating tasks on rally for each sprint, gave cisco resources and access to start working on the project. They started with basic testing framework so that we can get end to end view about the project, then gave sessions for the on project purpose and architecture. After that they gave us sufficient time to learn new technology and to present a small demo on whatever we were learning and gave continuous feedback which helped us with faster learning curve. We presented the demo and started helping team with generating test reports and slowly ramped up with understanding the project more deeply and started contributing in the main project as developers. They helped us whenever we were stuck and mistakes were welcomed as a fresher, allowing us to understand the cisco guidelines and helped us to learn IT standards. Started with giving small task like writing junit test cases to understand the backend fully for 1 sprint and then I started developing apis on the backend just like other cisco employees. Then mentor guided us to understand the deployment environment where these features were deployed in local environment for our project release. They also included us in grooming sessions, spring plannings from day 1 itself, which initially was just filled with cisco buzzwords but later on we were able to understand all the features that were to be designed. It was a great experience to phrase from a fresher to being treated as a cisco employee. Managers, mentors and other team members were always ready to help us out whenever needed, but also taught us adapt to environment where we won't be guided for each

and every step by someone and take responsibility of our own work. They taught us how to think and proceed with work instead of helping us directly with writing code or providing direct resources, by providing hints.

Academic courses relevant to the project: Object oriented analysis and design was a good course and helped with understanding design patterns followed in the project frameworks.

Name: Vasanth S(2018H1230157G)

Student Write-up

Short summary of work done during PS-II: Worked in a security project which restricts the access of users trying to access resources that they are not supposed to. The project is an automation tool which intelligently fixes this security vulnerability.

Tool used (Development tools - H/w, S/w): Django, Python, Django Rest Framework, Redis.

Objectives of the project: Fixing a security vulnerability.

Major learning outcomes: Technologies and tools.

Details of papers / patents: None.

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

Academic courses relevant to the project: No.

PS-II Station: Cisco Systems (India) Pvt. Ltd. - Hardware, Bangalore

Faculty

Name: Raja Vadhana P

Student

Name: Vatte Bhaskar Reddy(2018H1230172G)

Student Write-up

Short summary of work done during PS-II: I am in a physical design team, initially I had some sessions to learn about the concepts in physical design and concepts specific to Cisco flow. Then later, I worked on macros placement for a block to reduce the congestion to improve timing. For another block, I mainly worked to reduce DRC's and shorts in multiple iterations by applying different blockages in each iteration.

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

Objectives of the project: The main objective of physical design flow is to complete the layout for design and get GDS II file with no timing violations, less power consumption and with minimum area.

Major learning outcomes: Since I am new to physical design, from first day of my internship I started learning all the concepts related to flow. I learnt all the concepts required to physical design flow. I learnt all the settings in PNR flow in Innovus tool. Learnt scripting in tcl language. I understand and learnt all the techniques to close the block with no timing violations, less congestion and no DRC's and shorts.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment in Cisco is very good. We can ask the doubts to any one, they will answer very nicely.

Academic courses relevant to the project: VLSI design, CAD for IC design, Advance VLSI design.

PS-II Station: CL Educate, New Delhi

Faculty

Name: K. Venkatasubramanian

Brief write-up on each PS-II station: CL Educate, New Delhi is an IT-enabled education services company which has invested heavily into digital technologies like for offering innovative educational programmes at various levels. Students going for PS-II at CL Educate should be prepared with a strong foundation in Data Science, Artificial Intelligence and Machine Learning, Full Stack Engineering, using the software tools like Java and Python and their associated libraries. The industry looks for students with core technical skills in software development and data analytics, and soft skills like communication skills, leadership skills and people skills.

PS-II Station: Clumio India Technologies India LLP, Bangalore

Faculty

Name: Akanksha Bharadwaj

Student

Name: KURAKULA PARAMESWAR(2016A7PS0021H)

Student Write-up

Short summary of work done during PS-II: Knowledge about cloud architectures, building APIs in golang and unit-testing them. Building UI components using react JS and testing them using jest and enzyme.

Tool used (Development tools - H/w, S/w): Visual studio code, React JS, jest, enzyme, golang.

Objectives of the project: To build UI components using React.

Major learning outcomes: Insight into software industry, Building APIs using golang and unit-testing.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Opportunity to work alongside diligent developers. The company provides all the resources needed. Being a startup, it gives one an outlook on the complete software it is building. Also, one can work on either backend, frontend or automation based on interest.

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

Name: AKSHAT MITTAL(2016A7PS0042G)

Student Write-up

Short summary of work done during PS-II: *Developed an end-to-end application using cloud technologies and serverless web framework. Wrote both the frontend (Golang and AWS) and backend (ReactJS) for it.

* Worked on improvements in an internal tool used by the company. Created two new dashboards for the tool. Worked both on the backend and frontend for it. The dashboards were deployed on the tool and usable by the company engineers. Wrote thorough unit tests for all code.

* Worked on creating the User Interface for listing Virtual Machines for customers on the company's application. Worked mostly on the frontend for it. Created new components using ReactJS and functionality.

* Worked on modifying existing dashboards on the company's application for a new project being undertaken. Worked mostly on the frontend and API. The new dashboard was deployed and visible to customers.

* Worked on a proof of concept for GraphQL APIs.

Tool used (Development tools - H/w, S/w): AWS, Jenkins, Terraform, Golang, ReactJS, GraphQL, Postman.

Objectives of the project: To develop cloud-native computer software with thorough User Interface and testing.

Major learning outcomes: Learnt how software development in a cloud native setting works. Learnt the importance of user interface and testing in software development. Understood the software development process and the tools involved to make a complete end-to-end software.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The work environment was fast-paced. The work was on cutting-edge technologies. Interns were put through a month of training programme in the beginning and were expected to learn the process of developing cloud-native applications, which was to be demonstrated by solving an assignment at the end of the training. Employees are helpful and supportive. Projects given, even to interns have a high impact. Everyone is given autonomy and ownership of the project. Deadlines are generally tight, but not unrealistic.

Academic courses relevant to the project: Computer Programming.

Name: VISHAL JAISHANKAR(2016A7PS0114H)

Student Write-up

Short summary of work done during PS-II: Looking into feasibility of new data sources a PoC on backing up and restoring GMAIL mailboxes and comparing existing implementations was done. Restore module in Outlook takes care of restoring mails into mailboxes in O365 and when too many requests are sent to the server it is going to get throttled implying to retry after a while. Throttling handling was not handled and I was asked to manage error and throttling scenarios to make restore more resilient. There was a need to improve performance of restore. So using goroutines I made the restores concurrent and using channels the errors were handled. Post Mid Sem time was mainly utilised to work on bug fixes and improvements around the Clumio M365 Restore Module. Feature Flag control for concurrent EWS uploads. Parallel Folder creations in case of large numbers of folders and feature flag control. Following were the debugging tasks.

1. Handling calendar mail uploads that were skipped earlier due to EWS upload error.
2. Draft mails to be restored as drafts and not normal mails.
3. EWS call failure due to different Email Id and UPN.

Tool used (Development tools - H/w, S/w): AWS Lambda, Jenkins, Golang.

Objectives of the project: Improvements and bug fixes for Clumio exchange restore module.

Major learning outcomes: Writing production ready code, Unit testing, CI/CD pipelines.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Strong culture values followed at Clumio. Everyone is helpful in case of doubts. Company values ownership of the work done by an employee. It encourages to ask questions and get them clarified.

Academic courses relevant to the project: Object oriented styled programming in golang.

Name: SARVESH SUDIN KAKODKAR(2018H1030046G)

Student Write-up

Short summary of work done during PS-II: Worked as a full stack developer. Writing code for a distributed cloud native architecture to deploy and maintain microservices in the cloud. These microservices are deployed on docker container which is orchestrated using kubernetes. All the above microservices communicate with each other using GRPC / SQS protocols and provide REST HTTP APIs for the UI to consume. The UI is build as a react app with typescript as the language of use and Redux for state management. Unit tests are written by the developer.

Tool used (Development tools - H/w, S/w): GoLang, React, Typescript, Redux, Jenkins, Terraform, Kubernetes.

Objectives of the project: Objective was to retrieve data from the working product to be displayed for the support environment.

Major learning outcomes: Writing industry level code, great culture, agile development, reviewing code.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: Company is still growing with a startup culture build from ground up by industry experts. Main focus is on honesty and trust. HR is proactive and always ready to help with any work place related issues. Employees are ready to help without hesitation and explain the concepts in a clean manner.

Academic courses relevant to the project: Cloud computing, Data structures and algorithms, Advanced Operating Systems, Computer networks.

PS-II Station: Collegedunia Web Pvt. Ltd., Gurgaon

Faculty

Name: Ashish Narang

Student

Name: AKSHAY ASTHANA(2015B5A30673H)

Student Write-up

Short summary of work done during PS-II: I worked on fetching and backing up our data from the API of the third-party tracking platform that our uses, for future uses of our in-house made tracking platform. After that, I worked on benchmarking of redirect times for various tracking platforms and their offers, to monitor and analyze their performance and to compare the performance of our platform with others tracking platforms in the market.

Tool used (Development tools - H/w, S/w): NodeJs and various javascript libraries.

Objectives of the project: To backup our data on our cloud. To monitor the performance of our platform.

Major learning outcomes: Learned about back-end APIs, NodeJs, Grafana, InfluxDB, Telegraf, monitoring and visualizing performance of webapps.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment was very open. Anyone could talk to anyone, anytime. Everyone was very helpful on my team (3.14 Digital). During work from home period, communication was clearly maintained. Everyone used to respond very quick to my messages and emails.

Academic courses relevant to the project: None.

Name: NIMANSHA(2016A1PS0492H)

Student Write-up

Short summary of work done during PS-II: Apart from Collegedunia, there are certain other products that come under Collegedunia. One such product is CarHP, it is an online research and sales portal for vehicles centered around us. I was a part of the CarHP Tech team. I have worked to achieve several objectives in order to improvise different aspects of the website. I've worked to improve the admin portal for the ease of the content team and designed a database to shift certain statically stored data to dynamic storage. Apart from these, I've worked to design a URL controller in order to activate / deactivate and keep track of activated URLs across the website. Also, I've worked to interlink different sections of the website so as to improve the user experience.

Tool used (Development tools - H/w, S/w): Laravel 5.6 (PHP Framework), PHP, PHPMyAdmin (for MySQL Database), MongoDB, Redis, POSTMAN (for testing APIs).

Objectives of the project: The main objective of the project was to improvisation in the functioning of websites handled by CarHP team, Collegedunia and to optimise the page load speed.

Major learning outcomes: Working on the project required a basic knowledge of PHP. I learnt basics of MongoDB and functioning of Redis. In addition to this, I got to learn the working of APIs and how we can use postman to test the API hits.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment is fine. Slightly hectic but good learning experience. You'll get to enhance your skill set.

Academic courses relevant to the project: DSA, DBMS (SQL).

PS-II Station: Confluent India Pvt Ltd., Bangalore

Faculty

Name: Pradheep Kumar K

Brief write-up on each PS-II station: Required more knowledge on Artificial Intelligence, Quantum Computing, Augmented and Virtual reality, Blockchain.

Student

Name: SHUBHI JAIN(2015B4A70317G)

Student Write-up

Short summary of work done during PS-II: I worked on the Protobuf telemetry pipeline which takes the Protobuf telemetry data from Kafka and writes it to BigQuery. Initially, when the legacy Blueapron Protobuf converter was being used to publish data to BigQuery only partial data was getting written. I had to figure out the fault, correct it and ensure that all the data gets written to BigQuery successfully. The changes that were made were tested in the cloud environment and then merged after approval. The data obtained from the Blueapron converter was simply deserialised but not formatted. This data was difficult to read and query, hence I had to develop a new converter. This converter deserialises the data and generates a schema based on user requirement. The data obtained from the deserialisation is then processed according to the schema. A final record is constructed and sent to be written to BigQuery. This converter was rigorously tested on the cloud environment along with all the user configurations that were made part of it.

Tool used (Development tools - H/w, S/w): Docker, Kubernetes, BigQuery, Confluence, Protobuf.

Objectives of the project: 1. Ensure all the telemetry pipeline data gets written to BigQuery successfully. 2. Develop a converter that deserialises the Protobuf telemetry data, converts it to a simplified form, generate a configurable schema for the same and publish the data.

Major learning outcomes: I learned how to write good quality optimised code and test the same. I learned new technologies like Kubernetes, Docker, Kafka, BigQuery and Protobuf. I learnt how a converter is developed and how things are run in a cloud environment. I also learnt how to work in a global team set up.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment at Confluent was flexible and everyone in the team was helpful. Also, not only was in touch with the India team but was also in constant discussion with the teams abroad regarding the project.

Academic courses relevant to the project: Yes a little. But mostly I acquired knowledge apart from what is taught in the courses. However, the knowledge obtained from the courses helped me wrap my head around these new concepts quicker.

Name: PRAJWAL RAVISHANKAR(2016A7PS0089H)

Student Write-up

Short summary of work done during PS-II: My project was to design and create FTPS source and sink connectors. Connectors are programs that move data from an external system to Apache Kafka and vice-versa. Pure Java was used to code the connectors. You own the entire project, from design to development to testing to release for public usage. Code was deployed into production and the connector is available on Confluent Hub for trial.

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

Objectives of the project: Creating FTPS source and sink connectors.

Major learning outcomes: Creating FTPS source and sink connectors.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Well equipped office, though slightly small and new. Helpful and friendly people. The company expects quality work at a reasonable speed.

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

PS-II Station: Credit Suisse - Credit Analytics, Mumbai

Faculty

Name: Bandi Venkata Prasad

Student

Name: ANSHUL KUMAR KAUSHAL(2016A4PS0207G)

Student Write-up

Short summary of work done during PS-II: My main responsibilities during the internship included helping the team in solving pre-deal analysis requests from different FOs from around the world. The deals could be as simple as a collection of plain vanilla interest rate swaps to the more complex ones like credit default swaps, equity return swaps or Repo trades. My work also involved helping the team with the automation of the development of proxy figures for different types of plain vanilla trades for different notional values, currencies and tenors. All of this fell under the ambit of Credit Risk Management & the role could be broadly classified as a Credit Risk analyst role.

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

Objectives of the project: Help the team perform their BAU on a daily basis & automate the process for the plain vanilla trades.

Major learning outcomes: 1. Gained hands-on practical experience about the inner workings & functionings of a bank.

2. Applied theoretical knowledge of Excel, SQL to practice and learnt a thing or two about automation.

3. Learnt a lot about teamwork & taking care of different stakeholders.

4. Gained some insight about the practical aspects of different types of trades & transactions.

Details of papers / patents: I submitted a report & made a presentation about my work. No papers / patents were filed.

Brief description of working environment, expectations from the company: I was fortunate enough to be placed into a team that was closely knit, and where all of the team members were quite helpful. They were supportive in helping me adjust to the company's setup- rules, policies and internal tools, all of which were quite new for me. They respected each other's priorities and the working environment was great overall. The amenities provided were also very good and I was quite surprised at the high number of volunteering events organized by the firm. It showed that they really cared about giving back to the society, simultaneously providing their employees with an opportunity to do the same.

Academic courses relevant to the project: NA.

PS-II Station: Credit Suisse - Global Market Risk Management, Mumbai

Faculty

Name: Bandi Venkata Prasad

Student

Name: ISHIKA SOMANI(2016A1PS0698P)

Student Write-up

Short summary of work done during PS-II: 1. Worked in market risk management with scenarios stress testing team, generating reports on risk exposures of the firm based on daily market moves and positions taken.

2. Stress testing involved using historical moves in market or forward looking moves (simulated moves) to generate profit and loss numbers for the firm based on its positions in present.

3. Particularly worked on analysis and reporting of vega risk and how daily trades and market moves changed the exposure.

4. Also worked on capturing complex risks such as cross gamma risk in equity-rates products to see how much capital must be kept for liquidating them in case of adverse movements.

Tool used (Development tools - H/w, S/w): Excel, PLSQL, company's internal softwares for VaR calculations and getting sensitivity numbers.

Objectives of the project: There wasn't a fixed semester long project, but rather daily analysis and reporting.

Major learning outcomes: 1. Learnt about a variety of structured financial derivatives (autocallables, barrier options etc) and their multiple risk exposures across asset classes (equities, FX, rates, commodities) and sensitivities (delta, vega, gamma, cross gamma, theta).

2. Risk calculation (as Scenario P&L and VaR) and the its impact on the trades happening subsequently and capital requirements to liquidating.

3. Excel as a powerful analysis tool, making Pivot tables and Macros, along with other functions. Also learnt basic SQL queries.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Company culture was nice and teammates were very friendly and cooperative, I had frequent learning sessions with them, and they were very approachable if I had questions or doubts. Expectation from the team was basic derivatives knowledge, otherwise there was enough time given to learn work specific details. Also the working hours (8 hours on avg) were decent.

Academic courses relevant to the project: Derivatives and risk management, Financial engineering.

Name: KARAN AVASTHI(2016A7PS0092P)

Student Write-up

Short summary of work done during PS-II: Analysing and reporting CS portfolio positions w.r.t. market risk capital, VaR, RWA, RNIV. Analysis of strategies followed by front desk and assessing the impact on the portfolios, analysing market moves and their impact on capital, reporting the portfolio and risk metrics of Credit Suisse across businesses. Also automated various risk reports using Excel VBA and Python.

Tool used (Development tools - H/w, S/w): Excel, Excel VBA, Python, Bloomberg, Some in-house Credit Suisse Softwares.

Objectives of the project: Risk analysis and reporting. Automation of risk reports and models.

Major learning outcomes: Gained practical knowledge about risk and other domains of finance. Also got a huge exposure to the corporate office culture.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Credit Suisse has a traditional corporate office culture however they don't differentiate between a full-time employee and an intern. Expect to be handed over a lot of responsibility and work when you join. You will have to go through a lot of learning modules and training.

Academic courses relevant to the project: FRAM, DRM.

PS-II Station:Credit Suisse - International Wealth Management, Mumbai

Faculty

Name: Bandi Venkata Prasad

Student

Name: SAHIL MANTRI(2015B3A10377G)

Student Write-up

Short summary of work done during PS-II: You will be expected to do a wide range of research projects, which includes information gathering, financial statement analysis and understanding industry value-chain. To work on thematic ideas by understanding the requirement, brain-storming on possible macro and micro impact, finding relevant data from various sources and submitting the conclusions. To support the team in preparing financial models, report writing and data mining.

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

Objectives of the project: To understand alternative investment industry.

Major learning outcomes: Private equity, Hedge funds, Commodities and real estate.

Details of papers / patents: PE performance and trends.

Brief description of working environment, expectations from the company: Positive, Good people and Lots of learning.

Academic courses relevant to the project: BAV.

PS-II Station: Credit Suisse - Prime Services, Mumbai

Faculty

Name: Bandi Venkata Prasad

Student

Name: AKHILESH MUKHEDKAR(2015B3A10617H)

Student Write-up

Short summary of work done during PS-II: Understanding components and functions of investment banking, Fundamentals of financial reporting, Concept of short selling and trading revolving around it, Inventory management, Client analytics, Index rebalancing.

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

Objectives of the project: Understand inventory management and stock borrowing and lending.

Major learning outcomes: Visibility to how an investment bank acts as a market maker.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Mentors and VPs are constantly inspiring the interns.

Expectations - Sincerity, hard Work and most important they seek people who show interest in the work given.

Evaluation is based on how one reacts to challenges and learnings derived from it.

Academic courses relevant to the project: SAPM, DRM, FM, Mathematics I,II &III.

Name: JAYESH SANJAY MASAND(2015B3AB0634P)

Student Write-up

Short summary of work done during PS-II: The work at the department was with client analytics, business analytics, risk advisory and soft dollars teams. My work with business analytics majorly involved automation of existing reports (daily / weekly) with the help of excel macros by gaining understanding of the base of the report. With soft dollars, we built a pricing framework for existing CSA which may be a huge cost effective measure for the company by analysing the trade data of 2019. Risk advisory and client analytics involved preparing reports as a daily deliverable and updating queries for data sets used for client facing reports using SQL. I also prepared a tableau dashboard for risk advisory team for understanding exposures across different parameters.

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

Objectives of the project: Understand existing processes and find a way (potentially through Macros) to make it more efficient. Find trends in the datasets as a reaction or in anticipation to market moves and improving the anonymization criteria for existing datasets.

Major learning outcomes: Soft skills (Communication, Self-evaluation, team-work, etc.), Excel (intermediate-advance level), Excel - macros, SQL (practical application), Tableau.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The hours were longer as compared to any other intern in the firm and it is not just for the interns but permanent employees as well. They expect you to deliver on time even if it requires working overtime (coming in early or leaving late). As CS being a multinational financial services firm, they are strict about compliance. Most of the external sites are blocked so you can't browse anything other than the essentials. Having said all of that, the team members are very supportive and so are the managers. They understand your situation and guide you in the best possible way. As an intern in the organization, they suggest you appropriate tasks that may benefit you the most. Structure of the organization is rigid but the higher level managers are quite approachable and open to suggestions. Overall, the experience on all levels was really good for me.

Academic courses relevant to the project: The academic courses help up to an extent. We had a few training sessions with the team leads at the start of the internship (quite flexible). These training session were to understand the work each team does and to understand the business properly.

Name: NATASHA SINGH(2016A2PS0475H)

Student Write-up

Short summary of work done during PS-II: I worked with the risk management team to complete my scenario validation project. I was given the task to validate the impact of a scenario on the portfolio that is obtained from their external tool vendor is in line with the expected impact. I understood the MDS file structure and its various interpretations. Task was to validate the full revaluation results using the partial revaluation results.

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

Objectives of the project: To validate full revaluation result using partial revaluation result.

Major learning outcomes: Major learning was how market observed variables like yield, swap rate, CDS spread etc are correlated to relevant financial matrices.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The team was very friendly and helping. They guided me throughout the project and gave me several feedback which enhanced my learning.

Academic courses relevant to the project: NA.

PS-II Station: CtrlS Data Centre Pvt. Ltd., Hyderabad

Faculty

Name: Chennupati Rakesh Prasanna

Student

Name: M K S AMRUTHAVARSHINI(2016A7PS0027H)

Student Write-up

Short summary of work done during PS-II: Learnt Azure DevOps automation tools for continuous integration and continuous deployment. Learnt Terraform, an infrastructure as code tool to create and maintain Azure resources. Used Jenkins to create, schedule builds and to create CI/CD pipelines.

Tool used (Development tools - H/w, S/w): Microsoft Azure, Terraform, Jenkins.

Objectives of the project: To learn to use different DevOps tools to automate slow and manual software release process from build to deploy.

Major Learning Outcomes: Learnt important automation tools such as Jenkins, Terraform and Azure DevOps services.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work was mainly based on Microsoft Azure. Good place to work for people interested in DevOps / automation.

Academic courses relevant to the project: DevOps tools are not relevant to the Academic courses studied in the college.

PS-II Station: Cypress Semiconductor India Pvt. Ltd., Bangalore

Faculty

Name: Satya Sudhakar Yedlapalli

Student

Name: Sahana H G(2018H1400117G)

Student Write-up

Short summary of work done during PS-II: Worked on capacitive sensor technology, theory and firmware design techniques. Sliders are used in applications where linear increment or decrement sensors are required. Capacitive sensor slider was tuned to obtain equal sensitivity among all the segments of the sliders. The tuning methodology was publicly released as a code example. Worked on architecture technical reference manual for the PSoC device.

Tool used (Development tools - H/w, S/w): PSoC 4 MCU, JLink, IAR workbench IDE, PSoC creator IDE, Modus toolbox IDE.

Objectives of the project: The main objective of this project is to get familiarized with the CapSense sensing technology and to tune the slider widget to ensure an even response across the entire slider and document the tuning procedure in the form of a code example.

Major learning outcomes: Capacitive sensing technology, PSoC device architecture, General coding best practices and Firmware techniques.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Good work-life balance and a good helpful team to work with. Gained a lot of knowledge during these 5 months.

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

PS-II Station: DBOI - Finance, Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: SHUBHI JAIN(2016A3PS0326H)

Student Write-up

Short Summary of work done during PS-II: I worked in the business finance division of DBOI, Mumbai. My day started with checking whether the jobs (basically a deed of pricing various securities) had ran without any errors or not, and if there were any, we have to inform the respective team about error and work on getting it error-free. After that, I had to work on the books that I was allotted- this varies from person to person. I worked on two books, one was a fairly easy internal book and the other book - CPM that is one of the most complicated book of business finance which acts as a barrier towards its automation. We have to calculate the risk for the previous trading day and send it to the trader so that she / he can make strategies accordingly. After that, the attributed PnL - which is followed by mostly every financial corporation had to be drafted. This part was tricky. If the driven PnL matched with the trader, it is your lucky day, otherwise you will have to think deep to find out the mistake But this also leads to a lot more learning part.

Tool used (Development tools - H/w, S/w): Visual basic, Excel, Internal DB softwares.

Objectives of the project: To understand the working of CPM desk.

Major learning outcomes: I got a real-time exposure to an investment bank and how it functions there. Disclaimer - it is not at all like it is shown in the movies, at least the middle office. I got better at dealing with people and have enhanced my soft skills. Also, I got to know what happens after the trader is done.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work environment was pretty organized and people are concerned about their work. They enforce you to explore and learn everything on your own- which can prove to be very beneficial.

Academic courses relevant to the project: FRAM.

Name: MOHIT MUSKAN(2016A5PS0736H)

Student Write-up

Short summary of work done during PS-II: I was working in rates department which comes under product control department of DBOI. As I was trusted with complex process so my work generally revolved around doing daily BAUs. It was a really wonderful experience. It's great opportunity to learn about how investment bank functions.

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

Objectives of the project: Product Control- Daily risk and P&L.

Major learning outcomes: Valuation basics, Learnt about investing banking, Learnt about products, Trading fundamentals, Excel, Macros, SQL, Python.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is good. Working hours are flexible. Everyone was co-operative.

Academic courses relevant to the project: DRM, FM, FRAM.

PS-II Station: DBOI - Market Risk, Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: RIYA SRIVASTAVA(2016A3PS0206P)

Student Write-up

Short summary of work done during PS-II: As a part of the portfolio team of the market risk department in Deutsche Bank, my major work entailed to automation of reports, for which my main programming language was Python. In addition to this, there were various daily analysis required, which could entail to cross-checking numbers across various incoming reports to ensure there were no unexpected jumps in the numbers.

Tool used (Development tools - H/w, S/w): Anaconda (precisely Jupyter and Spider), Tableau.

Objectives of the project: The main objective was to provide more automation to the team, thus leading to the elimination of redundant tasks and reducing manual time input in generation of reports. This paved way for the team members to not only further analyse larger and more important.

Major learning outcomes: This was a boost to my skills with the programming language Python. It also introduced me to the Tableau platform for creating and publishing reports.

Details of papers / patents: No papers or patents were pursued in the course of this internship.

Brief description of working environment, expectations from the company: The working environment is very amicable with the team members always ready to help you out in case you find yourself in a pickle. Not only this, the office environment is such that the interaction between various teams also persists and the functioning of the teams being inter-dependent helps you greatly in strengthening your network.

Academic courses relevant to the project: Partially yes, I done a few finance courses. I might have been able to extend my work beyond automation to further analysis of financial data.

Name: ANUBHAV KOUL(2018H1490368P)

Student Write-up

Short summary of work done during PS-II: The banking industry is one of the most important industries as far as the world's financial stability is concerned. Of the risks, the market risk is one of the most significant part of the overall risk of a bank. This report discusses about the market risk capital computation and the metrics of the market risk capital like value at risk, stressed value at risk, counterparty risk and their calculation methodology. The methodology for the analysis of the moves in value at risk which is the most significant part of regulatory capital is also discussed in the report.

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

Objectives of the project: Understand tools and techniques used in credit risk analysis.

Major Learning Outcomes: • FRTB is the future for market risk assessment as VaR (Value at Risk) is an efficient method of estimating risk, but it does have its own set of flaws. It does not account for tail risk. It gives you an estimate for the loss but not how much. "Expected Shortfall" scores over value at risk model because of the fact that it averages the expected risk and gives a better understanding.

- Additionally, historical simulation with full revaluation helps in an accurate calculation of VaR for a non-linear and complex product.
- Historical simulation helps one to understand VaR both in terms of sensitivity and market events on a historic date.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: In the start of the PS, the concept of Intern was made clear to us i.e. that initiative is the key to learn anything in corporate. In DBOI, we can expect that anyone can help or refer to a person who can help given that you have to take the initiative to talk first. Work culture is pretty much same as other employees. They will treat you and expect results from you same as an employee.

Academic courses relevant to the project: FRAM, BAV & SAPM.

PS-II Station: DBOI - Valuation Control, Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: ARVIND M ATHREYA(2016AAPS0212H)

Student Write-up

Short summary of work done during PS-II: I am a part of rates division, which deals with fixed income securities like swaps, bonds, bond futures, repos, reverse repo, cross currency swaps, municipal bond trading, synthetic, non-linear, etc. The risk PnL is calculated overnight on DB systems and is ready for us to analyse in the morning. Every morning the attributed PnL is updated in one of the databases. The latest PnL number which are not yet confirmed officially are received. The updated numbers and the flash numbers are used to understand the daily PnL according to the desks. Once a week comparison of the desk earnings is done for the latest and previous year's earnings. Because many of the rates products are included in the derivatives section, the balance sheet is different for calculating the exposure of the positions. The numbers in all the balance sheets are updated from time to time and accordingly the forecast numbers are changed. The forecast has data mentioned which tells each trading desk how much they should earn to meet the plan and projected numbers. The teams also use the comments made by the valuation team and the book runners' team to understand the trade economics of new deals and factors that generate daily PnL for existing deals. All the comments

are summarised for weekly and monthly calls. Reports are made in accordance with the regulatory guidelines.

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

Objectives of the project: Daily risk and PNL is a vital part of the Deutsche Bank rates team. The team keeps the track of the daily PnL generated by trading desks situated in Europe and America. The team makes a plan at a particular point of the year on the revenue generation.

Major learning outcomes: From the work which has come my way during the course of this intern ship, I have been able to understand pricing, dynamics of the various financial instruments in detail and practically understand how they are used for various purposes. I am also able to relate all the news and articles that I have read about ups and down in the finance sector. I can relate to some of the things which I have learnt in college here. I have also learnt the vast applications of excel and how powerful it is. Overall, it has been an invaluable experience and a great learning opportunity.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: DBOI has a very warm and welcoming culture. All employees and managers are very friendly and approachable. One is expected to be inquisitive about the role and the corresponding tasks that come along. We are encouraged to question the existing standards and processes used, and come up with ways of streamlining them. However, you are expected to be punctual with our deliverables.

Academic courses relevant to the project: DRM, SAPM.

PS-II Station: DBOI-Rating Analysis, Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: PARTH KADVEKAR(2015B3A40555G)

Student Write-up

Short summary of work done during PS-II: I was a part of the Leveraged and Structured Finance (LSF) team in the Global Credit and Ratings Team (GCRT) division which falls under DB's Credit Risk Management (CRM) division.

- Spread annual / interim financial statement data of US and Europe-based counter-parties into a proprietary software which provided relevant ratios and key figures.
- Prepared capital structure of the company and reconciliation of its metrics like EBITDA.
- Assisted in the end-to-end preparation of a few credit rating reports towards the end of the internship duration.

Tool used (Development tools - H/w, S/w): DB's proprietary S/W, MS Excel, Bloomberg terminal (a few times).

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.

- Rating process of sub-investment grade Europe & US-based counterparties.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Very helpful working environment.

- Mentors and teammates would help understand stuff if approached.
- Very cordial senior management who can be approached for guidance anytime.

Academic courses relevant to the project: Financial management, Fundamentals of finance & accounting.

PS-II Station: Dell R&D, Bangalore

Faculty

Name: Vineet Kumar Garg

Student

Name: PALLAVI SATPATHY(2018H1030093H)

Student Write-up

Short summary of work done during PS-II: All the Dell's products have a set of user guides which have details about their configuration, usage, solutions to common issues the product faces etc. Whenever a user wants any such information, he / she needs to visit the Dell's website and search for the particular manual of the product which will give the information required by the user. As is evident, Machine Learning can significantly reduce the manual work here. My project was to build a chat bot, which on being a question by the user, searches all the products information and finds out the most relevant answer and then returns this answer to the user.

Tool used (Development tools - H/w, S/w): Keras, HTML, CSS, Javascript, Flask.

Objectives of the project: To build a chatbot for the Dell products from Dell's user guides.

Major learning outcomes: Applying fundamental concepts and methods studied in machine learning to build a deploy-able chat-bot end-to-end.

- Effective usage of oral and written communication to achieve project goals.

Details of papers / patents: NIL.

Brief description of working environment, expectations from the company: Dell India R&D creates a wonderful environment for learning both soft and hard skills. Their exemplary guidance, constant encouragement and careful monitoring through the internship are the main reasons which helped me in finishing the project.

Academic courses relevant to the project: Information retrieval, Advanced data mining, Machine learning.

Name: NITIN VERMA(2018H1030112H)

Student Write-up

Short summary of work done during PS-II: Project 1. Local dev environment: In this project, the objective was to run the services on the local development machine of the engineer which were running on a Kubernetes cluster on the cloud before.

Project 2. Testing framework: In this project, I worked on writing a testing framework based on pytest that would allow developers to test their code changes / new features locally without having to make a docker image of the repo and uploading that image to the pods where testing was done before

Project 3. Generating new endpoints and server code: This project revolved around generating new restful API endpoints dynamically and generating server code for those endpoints. The APIs were written in Go.

Tool used (Development tools - H/w, S/w): Docker, GoLang, OpenAPI 3.0, Pytest, Swagger, GenSON, Docker-compose, Shell scripting.

Objectives of the project Improve productivity of the engineers and develop a Restful API.

Major learning outcomes: Learnt new technologies like Docker, Kubernetes and also learnt Go programming language for one of my projects.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment was very good. Even during the lockdown, everyone was supportive and helpful. This helped me getting settled here easily. There were virtual coffee sessions every tuesday that helped motivate people and boost their morale even during difficult times like this.

Academic courses relevant to the project: yes, OS and computer networking were most relevant courses.

Name: SAYALI SUNIL NIKAM(2018H1030141P)

Student Write-up

Short summary of work done during PS-II: I was working on developing an AI assistant for Dell's poweredge servers.

Tool used (Development tools - H/w, S/w): RASA open source, SSH.

Objectives of the project: Chatbot for iDRAC.

Major learning outcomes: The primary purpose of this project is to build the Q&A chatbot to improve the human interaction and performance of the iDRAC concerning its users. For this purpose, RASA open sourceframework has been used. This has given the excellent opportunity to learn and modify the chatbot according to the company's needs. Along with this activity, all other requirements needed to be included, helped me learn about REST APIs and its application, web-scraping to get the dataset needed to feed in the chatbot's learning model. Built the dataset and framework which must be fed to the chatbot. With these all, I have completed the development of the iDRAC_Bot with specific requirements as product needs, almost a perfect and an effective learning model. Along with this project, I have done some other courses side by side, which really helped me to learn the python, machine learning & deep learning concepts in depth, chatbot building and understood the RASA framework thoroughly.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Everyone is helpful, each one motivates you to complete work on time, it's a nice place to work, and a good work-life balance.

Academic courses relevant to the project: Machine learning, Deep learning, Data science, Operating system, Data structures, Python , etc.

Name: BHUPESH KUMAR GUPTA(2018H1120263P)

Student Write-up

Short summary of work done during PS-II: I 've been working on USB Mounting and booting client application using WebSocket in java. I was required to create a plugin to mount USB from local machine to the remote server using USB enumeration and SCSI, So that mounted USB can be used in a similar fashion as the normal removable drive is like storage, adding data, booting OS, etc. This plugin will support all OS, like windows, Linux and OS X. Needed to connect with server virtual machine using WebSocket and read MBR (Master Boot Record) from USB to mount USB following USB enumeration process in java using SCSI command to read, inquire and write.

Tool used (Development tools - H/w, S/w): Eclipse IDE, JSR356 Websocket, Putty, Wireshark, SWING.

Objectives of the project: Optimized USB mounting and Booting client application for any remote server.

Major learning outcomes: SCSI, MBR, BIOS, UEFI, GPT, Booting, JNI, WebSocket, Writing Optimized network file transfer code, Stress testing, USB Enumeration, USB mounting and de-mounting.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: Dell R&D people are professional and allocate your expertise wise project within a week of your joining. Infrastructure and environment development is done in parallel so no time is wasted. They provide problem statement and purpose of the project. Knowledge transfer is done if required any people here in DELL are approachable. Since, I was the part of the team and my project was a POC, so I got full support from every member depending on the various part of the project. They expect you to start working from the day your project is handed over to you without wasting time, weekly head sup occur to check your growth and help to be given if stuck in between. Before starting to work on any project it is expected to sit with manager and mentor talk about the solutions and pick the best solution and disadvantages, if any. Once manager approval is done then only proceed with the development of project. It is expected to make documents for everything related to the project and get it reviewed by the mentor.

Academic courses relevant to the project: OS, JAVA patterns.

PS-II Station: Divgi TorqTransfer Systems Pvt. Ltd., Bhosari, Pune

Faculty

Name: R S Reosekar

Student

Name: Kiran Kumari(2018H1410102G)

Student Write-up

Short summary of work done during PS-II: Things to learn on the shop floor. All the industries have its own shop floor for the production of the goods / components / assembling of the components. So, employees should know how to maintain the shop floor to minimize the accidents, how to increase the productivity, even they should know about operator license, check sheet, Symbols, Notation etc.

Transfer Case:

Here analysis of torque carrying components like input output and rear output shaft, planetary gear and to know the deflection of the shaft, bearing life, contact chart of the teeth mating, effects of micro geometry on the teeth of the planetary gears, transmission error and the force transmission etc.

Sun-Pinion Gear:

The sun and planet gear is classified in epicycle gear train, it consist of one sun, annulus, and planets/pinion. All the three components meshes to each other in such a way that their pitch circle rolls without slipping. With different end chamfer, what would be the effect of stress and total displacement and where would be the location of the stress from the root diameter of the sun gear.

Trolley: To left the heavy components or assembled product and to shift the product from one place to another place trolley play a very important role. Trolley are generally controlled by hydraulic fluid or mechanically.

Tool used (Development tools - H/w, S/w): Ansys and Masta software.

Objectives of the project: 1) To analysis of torque carrying components of transfer case 4:1 and 2.48:1 by using Masta software. 2) Analysis of Sun Gear in Ansys to know about max stress location from the root of the teeth, total deformation, max principles stress in the sun gear.

Major learning outcomes: Capabilities of Masta software, in depth Ansys as well. Exposer to practical based problems, how to overcome those challenging problems, responsibilities, communication among employees.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working in DTT-S is very good & healthy environmental, gave a lot of work to do from technical to nontechnical work, there you won't be stick to a single task, they will provide you multiple tasks, people are really very helpful and will guide you whenever you need them. You will be treated as an employee. I am satisfied with my PS because I have learnt a lot there.

Academic courses relevant to the project: Yes, it was, as being a design engineer they mostly try to give work related to design, even though the company is fully based upon manufacturing, they purchased this software before my joining dates like software Ansys and MASTA.

PS-II Station: Dorsch Consult (India) Pvt. Ltd., Mumbai

Faculty

Name: Mahesh K Hamirwasia

Student

Name: KANALA RAHUL REDDY(2018H1300073P)

Student Write-up

Short summary of work done during PS-II: Expansion of passenger terminal building at Dehradun and Raksha Shakthi University, Lavad, Gujrat.

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

Objectives of the project: Project is in construction phase, Preperation of monthly progress Report and Project scheduling.

Major learning outcomes: Report writing, BOQ preperation.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Eventhough, it is a pretty small company the work done is significant.

Academic courses relevant to the project: Airport planning and Engineering.

PS-II Station: Dreamplug Technologies, Bangalore

Faculty

Name: Pradheep Kumar K

Brief write-up on each PS-II station : Required more knowledge on Artificial Intelligence, Quantum Computing, Augmented and Virtual reality, Blockchain.

Student

Name: SANJAY MALHOTRA(2016A7PS0126P)

Student Write-up

Short summary of work done during PS-II: Initially made a new backend service in golang, which gave me nice exposure to learn new technologies and build scalable microservices. Later, I was given work to improve the working of an old service written in golang. Overall, learnt many new things and approaches we use in real world.

Tool used (Development tools - H/w, S/w): Golang, JAVA, AWS, SignalFx.

Objectives of the project: A service for everything related to geo. Improvements in another service which communicates with credit bureaus.

Major learning outcomes: How to build scalable microservice, complete microservice architecture, unit testing, deployment on AWS, Instrumentation in services.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Great working environment, you get to learn a lot of new things from very talented people in the industry. You

will be included in many high level decisions where you can give your point of view. People will help you out in your transition to corporate life.

Academic courses relevant to the project: Object Oriented Programming, Data structures and algorithms, DBMS.

Name: SANJAY MALHOTRA(2016A7PS0126P)

Student Write-up

Short summary of work done during PS-II: Built a new service to store everything related to GeoData and processing of same to be consumed by the App. Bureau service improvements and redesign to make it extensible.

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

Objectives of the project: New service to serve and store all geo related data, Ground up redesign of bureau service.

Major learning outcomes: Low level design of software, AWS ECS, AWS Lambda. Saved the firm lakhs of rupees with redesign of bureau service. New Geo-service aims to provide geo based rewards exploration. Bureau service bugs solved and retry logic helps bring in thousands of users each month.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: All your opinions and ideas do matter, be vocal about them. Moreover you will build products that will make a difference.

Academic courses relevant to the project: Object Oriented Programming, Data structures and algorithms, DBMS, DAA.

PS-II Station: Dreamplug Technology - Operations, Bangalore

Faculty

Name: Pradheep Kumar K

Brief write-up on each PS-II station : Required more knowledge on Artificial Intelligence, Quantum Computing, Augmented and Virtual reality, Blockchain.

Student

Name: PREET SINGH KHALSA(2015B3A30657P)

Student Write-up

Short summary of work done during PS-II: I worked on increasing payouts efficiency at CRED. Worked across teams (design, payment operations, engineering and product) executed projects in three areas,
Operations processes
User interaction and impact
Engineering systems

Tool used (Development tools - H/w, S/w): Metabase, signalfx, sql, tableau, excel.

Objectives of the project: Optimize payouts efficiency.

Major learning outcomes: Tableau, SQL, Stakeholder management
Knowledge of tools to facilitate data streaming and consumption - SignalFX, Kafka, Druid, Superset, Product management.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: High energy, high responsibility work environment.

Academic courses relevant to the project: Econometric methods.

PS-II Station: Ecom Express Pvt. Ltd. - Data Science, New Delhi

Faculty

Name: Ashish Narang

Student

Name: Priyank Sharma(2015B5A40827G)

Student Write-up

Short summary of work done during PS-II: 1. NEO4j: Having a graph data base will increase the efficiency of the team and henceforth of the organisation by manifold. Neo4j is a free to use service and leveraging it for data science purposes is highly recommended due to its inbuilt supported libraries for data scientists.

2. Power Bi: Business team decision making will be eased with the help of Power bi.

3. Folium: Everyone in the team can leverage powerful package in python for visualization, Folium, without going into the related intricacies. Visualisation class developed by me is encapsulated and is made keeping in mind the person who has not heard of Folium before. Simplicity is the key.

Tool used (Development tools - H/w, S/w): NEO4J, POWER BI, PYTHON.

Objectives of the project: 1.NEO4j: Having a graph data base will increase the efficiency of the team and henceforth of the organisation by manifold. Neo4j is a free to use service and leveraging it for data science purposes is highly recommended due to its inbuilt supported library.

Major learning outcomes: GRAPH BASED DATABASE: NEO4J, MAKING DASHBOARDS ON POWER BI, OBJECT ORIENTED PROGRAMMING IN PYTHON.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment is fine. No expectations as such.

Academic courses relevant to the project: OBJECT ORIENTED PROGRAMMING.

PS-II Station: eKincare (Aayuv Technologies Pvt. Ltd., Hyderabad)

Faculty

Name: Chennupati Rakesh Prasanna

Student

Name: KASARANENI AKHIL(2016A3PS0277H)

Student Write-up

Short summary of work done during PS-II: I was asked to collaborate with the android mobile team of 2 members to implement new features and also to fix the already existing bugs or new bugs we encounter while adding the new features. The tasks to be completed are usually done through the sprints of 2 weeks and we are expected to finish the tasks we are allotted to in those 2 weeks. During my internship with ekincare, our team made some significant changes to the UI and fixed some major bugs. Some of the features include adding multifactor authentication to the App, hiding sensitive data when the app is in background, adding FAQ's to different sections of the app, modifying the entire UI and functionality. In one particular section of the App, making changes to the notifications of the App and to detect the android device if it's rooted or not.

Tool used (Development tools - H/w, S/w): Android Studio, Java, Kotlin, XML, Xcode, Swift, Git.

Objectives of the project: Mobile App development.

Major learning outcomes: Mobile App development.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The IT staff are relatively small and very helpful.

Academic courses relevant to the project: OOPS.

Name: KOTHWAL SHAIKH KHALID RIYAZ(2016B4PS0483H)

Student Write-up

Short summary of work done during PS-II: I was part of the Backend development team of the application, and involved with testing, refactoring the modules, fixing bugs and implementing some backend oriented or dev-ops related features for the application. Majority of the work was carried out in the Ruby on Rails framework with the database in PostgreSQL. There were some frontend tasks as well which required skills in HTML, CSS and HAML. The work was mainly carried out in sprints where I was assigned tasks depending on the need of my mentors or the company in that timeframe, instead of working on an extended project for months. The version control was carried out through GitHub with the project management software used was Jira.

Tool used (Development tools - H/w, S/w): Ruby on rails.

Objectives of the project: To make enhancements to the backend code through refactoring, bug fixes and new product features.

Major learning outcomes: Learned a ton about how a startup organisation workflow, incentives and communications happened and how features evolve from ideation to full live deployment to production.

- Learned about the popular backend development framework - Ruby on rails along with some frontend JavaScript and HTML / CSS.
- Learned about technical concepts like OAuth, REST APIs, RPCs, Connectors, Asynchronous workers, Exception handling and monitoring software, CI / CD etc.
- Learned about test driven development and to cover your ground by writing tests / specs for your code to ensure no changes in the future unintentionally break something.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work environment is relaxed and the engineer peers were rather good with a competent CTO whom you can approach as it suits you. My manager was also very proficient and rather empathetic.

- They peers and mentors are pretty helpful and friendly.
- You're expected to contribute to actual features in a fast paced environment.
- They gave the 3 of us PS interns MacBook pros.
- Work timings were flexible and no issues if you can get the work done in time, but this is really dependent on your manager / mentor.
- The HR seemed to be in a disarray, and the company is not doing financially really well currently.
- Also got the impression that the marketing department is not doing very well when in fact, their product is really dependent on marketing & sales.

Academic courses relevant to the project: Not really. You need knowledge of the tech stack the company is working with above anything else. Advantage of course knowledge from CSE is limited.

PS-II Station: Emptycup Innovation Pvt. Ltd. - Tech (Nedo Software), Bangalore

Faculty

Name: Vineet Kumar Garg

Student

Name: PARIKSHIT SINGH(2014B5A20989H)

Student Write-up

Short summary of work done during PS-II: Emptycup is a interior designing automation tools, which incorporates many process of interior designing and some processes to ease and regulate the manufacturing processes.

The project revolved around development of plankslist and partslist which will give the sizes of each planks that is going to be used in the manufacturing process.

Tool used (Development tools - H/w, S/w): Sketchup, GIT, Pycharm, VS code.

Objectives of the project: Planks list and parts list module development.

Major learning outcomes: OOPs, DSA, DBMS, ethics and integrity and good coding practices.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Energetic and motivated.

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

PS-II Station: Energy Exemplar, Pune

Faculty

Name: Ankur Pachauri

Student

Name: ARISHANKARI R(2018H1240081H)

Student Write-up

Short summary of work done during PS-II: Energy exemplar developed PLEXOS for energy market optimization – Software which simulates real world energy markets to make the most informed decisions about future. The objective was to understand the underlying techniques and learn to work with PLEXOS, to create data sets required to optimize the results as much as we could and to start with data analytics for further development. After a 40 days training period in PLEXOS and data handling, we understood unit commitment, economic dispatch, four modeling techniques available in PLEXOS and how to get the simulation ready data set for PLEXOS.

The internship comprised of variety of projects

- I. Data Collection – Japan's Electrical Network – Thermal and Hydro plants
- II. Reliability Test Systems – 23 and 76 node models
- III. South Korean Grid Topology model
- IV. Mexican data Update v0.12
- V. EIC Geocoding

Tool used (Development tools - H/w, S/w): PLEXOS, MS Excel, Jupyter Notebook for Python programming.

Objectives of the project: The objective was to understand energy industry and market operations and to study PLEXOS enough to start with development projects in PLEXOS.

Major learning outcomes: Energy industry operations and markets, Data analytics, Linear programming, Machine learning.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: Overall, the PS programme at energy exemplar was to understand energy industry and market operations and to study PLEXOS enough to start with development projects in PLEXOS. The training period was both wide extensive and selective intensive to understand the requirements in depth. The variety of projects assigned was wide. It helped in getting a hands-on training in PLEXOS and the developmental activities in energy exemplar. Discrete optimization (specifically linear programming), Power system modeling and Data analytics was dealt with in detail during the program.

Academic courses relevant to the project: Advanced signal processing.

PS-II Station: Ernst & Young Global Delivery Services, Bangalore

Faculty

Name: Anjani Srikanth Koka

Brief write-up on each PS-II station: The below mentioned are the expectations from the industry in common apart from some specific skills in a student. A student can be better prepared by practicing these skills.

1. Exposure to marketing and finance course fundamentals
2. Data analytics
3. Proficiency in excel, python, R, SQL
4. Soft skills

Student

Name: MEESALA SMRUTHI(2015B4A30391H)

Student Write-up

Short summary of work done during PS-II: Derivatives valuation and financial modeling: Initially we were trained to learn how different financial derivatives work and how they were

valued. Apart from learning how to value them manually we learnt how to extract relevant market data and value them using various financial tools. The objective behind my project was to use stochastic models like the Hull white model to simulate interest rates to value constant maturity spread options. After simulating the rates, we focused on valuing a constant maturity spread option using the generated rates and developing the corresponding risk statistics.

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

Objectives of the project: To price a constant maturity spread using Hull white model.

Major learning outcomes:

1. Using microsoft excel and financial tools to value derivatives.
2. Stochastic financial models and using them to generate future rates.
3. Using Python to develop financial models.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment was very supportive and collaborative. Managers encouraged us to ask a lot of questions and helped us understand the financial domain and concepts better. Apart from working on our projects we also helped the company with their clients and other projects where they required our knowledge of programming.

Academic courses relevant to the project: Differential equations, Derivatives risk & management.

PS-II Station: Flipkart, Bangalore

Faculty

Name: Vineet Kumar Garg

Student

Name: SUVIGYA VIJAY(2015B3A80606P)

Student Write-up

Short summary of work done during PS-II: Worked on designing and developing a workflow manager for forecasting, the workflow manager was built from scratch to fit in the custom asks for the team.

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

Objectives of the project: Designing a workflow manager for forecasting.

Major learning outcomes: System design principles, networking and inter-process communication design, writing production grade scalable software systems.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment was brilliant, good guidance is provided on all grounds, meetings are scheduled to keep you on track and resolve any issues and blockers. Complete ownership of the work you have done, good learning platform overall.

Academic courses relevant to the project: Operating systems, Networking.

Name: CH VISHAL(2015B5A70605H)

Student Write-up

Short summary of work done during PS-II: I was part of the information security team. My work was in a spectrum of projects in the area of information and application security. Major projects include phishing campaigns, security awareness programs, security dashboard and tweaking data protection policies.

Tool used (Development tools - H/w, S/w): Netskope, McAfee EPO, GoPhish.

Objectives of the project: Building a security dashboard, coding phishing templates for phishing campaign, DLP event triaging and improving DLP policies, spreading awareness via presentations and documents.

Major learning outcomes: Inner workings of the DLP program in an information security team, I learned essential metrics for the company's cybersecurity posture and how to design a phishing campaign.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The company expects you to maintain a good work ethic and a strong desire to work, even on odd hours sometimes. The startup-esque working culture means that the deadlines and workloads can be tight, but there is abundant leeway.

Academic courses relevant to the project: Cryptography, Computer networks, Network security.

Name: RIGVITA SHARMA(2016A7PS0067P)

Student Write-up

Short summary of work done during PS-II: Worked on demand sales forecasting problem with the decision science team at Flipkart. Analysed and researched various machine learning models for the product sales forecast.

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

Objectives of the project : Month level forecast for demand planning.

Major learning outcomes: Learnt about new research advances in time series forecasting and analysis of high dimensional data.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working culture in my team was good and people are friendly and approachable. Lots of scope to learn and freedom to experiment in your work. Working on projects with huge impact and complete ownership of the project.

Academic courses relevant to the project: Machine learning, Neural networks and Fuzzy logic.

PS-II Station: GE India Technology Centre, Bangalore

Faculty

Name: Shashank Mohan Tiwari

Student

Name: PRERNA MANDAL(2018H1410158P)

Student Write-up

Short summary of work done during PS-II: Turbomachinery refers to the machines that transfer energy between rotor and fluid, including both turbines and compressors. Gearboxes are important for turbomachinery applications as they modify the speed and torque in order to convert energy into a compatible format. Hence, making the mechanical functioning easier in

industries easier. The project focuses on developing a design for an industrial gear box for turbomachinery by using AGMA standards.

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

Objectives of the project: The project focuses on developing a design for an industrial gear box for turbomachinery by using AGMA standards.

Major learning outcomes: While doing this project, I learnt about the functioning of various turbomachinery and the need and procedure to design a gear box for them.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: There is an excellent work environment in GE. Challenging work and a great team support made the learning during internship period much more easier.

Academic courses relevant to the project: Machine design.

PS-II Station: GenY medium, Hyderabad

Faculty

Name: Anjani Srikanth Koka

Brief write-up on each PS-II station: The below mentioned are the expectations from the industry in common apart from some specific skills in a student. A student can be better prepared by practicing these skills.

1. Exposure to marketing and finance course fundamentals
2. Data analytics
3. Proficiency in excel, Python, R, SQL
4. Soft skills

Student

Name: JOHN VIKAS KOTARU(2014B4A20661H)

Student Write-up

Short summary of work done during PS-II: I worked on SEM and SEO tasks for clients related to health care, e-learning and real estate sectors. It started with me getting to understand the concepts of SEM and SEO. My work was to manage Search and Facebook campaigns for the client to get them promised results while maintaining a desired CPL. This included going through performance metrics such as Impressions, clicks, CTR, Leads, FFR, conversions, on a daily basis to analyse them and draw insights which in turn will help to optimise the campaigns to get better results. I was also tasked with SEO related activities like on-page and off-page to improve the search rankings of the website by fixing technical issues through site audits, making content changes through keyword mapping, changes to metas, uploading schemas and generating backlinks.

Tool used (Development tools - H/w, S/w): Google Sheets, Google Adwords, Google Analytics, Search Console, SEMrush, Moz, Facebook Business Manager, Wordpress, Google Tag Manager, etc.

Objectives of the project: The objective of the project is learn different strategies and approaches for SEM and SEO, and implement them to get better outcomes for the client and the organisation

Major learning outcomes: Optimisation strategies for SEM, approaches for SEO, on-page and off-page SEO, usage of GA, search console and GTM, competitor analysis, keyword research and lead stage analysis.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work environment was good. Every day you get to learn something new. The people working at the company were friendly, helping out if there was a doubt or a problem. Tasks were assigned from day 1 and were given enough time to get them done. Most of the tasks were interesting but

some were tedious. After some time, the tasks get repetitive, so if you learn it well during the beginning, you can cut short on the time required to complete the tasks. All in all, it was a good experience taking up different and new tasks while working at the company. The company expects you to be accountable for your work. Your work will be recognized and appreciated well. And you will be contributing to the company's work from day 1.

Academic courses relevant to the project: None.

PS-II Station: Goldman Sachs India Pvt. Ltd. - Operations, Bangalore

Faculty

Name: Sidharth Mishra

Student

Name: SHASHANK MISHRA(2016A1PS0497G)

Student Write-up

Short summary of work done during PS-II: Named entity recognition : created a python package ,made a Machine learning pipeline and deployed model on kubernetes

Tool used (Development tools - H/w, S/w): python,pycharm IDE,spacy,alteryx

Objectives of the project: Automation of entity extraction from multiple documents

Major learning outcomes: Learned how machine learning pipeline works from idea to deployment

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Global work environment, my team was very open to a new idea, mutual respect for each other opinion

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

Name: JOEL MELVIN V(2016A1PS0905H)

Student Write-up

Short summary of work done during PS-II: BAU mostly consisted of the processes involved in generating a disclosure report which holds information of GS clients and the No. of shares each client holds in a company requesting the disclosure. It is done to prevent hostile takeovers, money laundering and the like. There is an opportunity for interns to attend DataSchool, where one can further develop their data visualization techniques. Projects assigned will mostly involve some form of automation (Example- using Alteryx or VBA).

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

Objectives of the project: To automate a process using VBA.

Major learning outcomes: Technical Skills - Alteryx, SQL and other data visualization tools. VBA (Macros), Soft skills, Importance of networking and teamwork.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Healthy Work environment. All the team members / employees are helpful. It is a very flat organisation, hence one can easily connect with the top management and get their insights. Regular meetings with MDs and global leaders. The company expects new ideas and a fresh perspective regarding their BAU processes. Also, they expect our projects to reduce the process time.

Academic courses relevant to the project: DRM, FOFA.

Name: NITESH KUMAR(2016A4PS0276P)

Student Write-up

Short summary of work done during PS-II: Use of macro in Microsoft excel for following automation process

- A. Email automation through excel
- B. Importing data from Outlook emails to excel sheet

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

Objectives of the project: A. Email automation for standard templates through excel using macros. B. Importing details from outlook emails to the excel sheet.

Major learning outcomes: • Use excel macro for automation process

- Linking different apps of Microsoft (Excel, outlook, word, power point etc.) to import and export information among these applications.
- Learnt to leveraged VBA (coding language for Microsoft applications).
- Editing the format of template and inserting the table from excel sheet to the body of email generated in outlook.
- Use of VBA inbuilt libraries to access emails of different folders (inbox, sent, draft etc.) in outlook and collating details contained in these emails in excel sheet.
- Use of regular expression to search specific text from email body.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The time for implementing major projects right from conceptualization is just a matter of few months. Moreover, there is no difference between permanent employees and interns. We are given as much respect as anyone else on the team. This made me feel important. Despite this, I never felt stressed out as every one is very supportive and are always ready to hold our hands if necessary.

Academic courses relevant to the project: Computuer programming, POE.

PS-II Station: Grasim Industries Ltd., Nagda

Faculty

Name: Arun Maity

Student

Name: SEVEKARI VAIBHAV VASANT(2018H1480190H)

Student Write-up

Short summary of work done during PS-II: 1) Gap analysis of cooling tower 2) Regression analysis 3) The new software was developed to predict the thermal performance of a cross-flow cooling tower without measuring the outlet water temperature.

Tool used (Development tools - H/w, S/w): CFD, Python 3.7, MS-Excel.

Objectives of the project: Keeping them running smoothly and reliably, Increasing cooling tower life expectancy, Maintaining and potentially improving performance.

Major learning outcomes: New software was developed to predicts the thermal performance of a cross flow cooling tower without measuring the outlet water temperature.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Motivates you to excel in your job for a better return on their investments.

Highly demanding when it comes to sales targets.

Good work culture.

Excellent remuneration.

Dignified working.

Academic courses relevant to the project: REFRIGERATION, CFD, ENERGY MANAGEMENT.

PS-II Station: Groww - Software Development, Bangalore

Faculty

Name: Akanksha Bharadwaj

Student

Name: GURUKIRAN V(2015B4A70481G)

Student Write-up

Short summary of work done during PS-II: I worked on multiple projects during my PS-2 involving react to build an internal dashboard for our customer service executives and Kotlin to help develop the android application. It was a great experience. The people are smart and helpful which the experience awesome.

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

Objectives of the project: Build website / App.

Major learning outcomes: Learnt modern technologies like React and Kotlin.

Details of papers / patents: No.

Brief description of working environment, expectations from the company: Since, it is a startup, the working environment is great. Importance is placed on the actual work. You can approach anyone in the entire company to ask doubts and just chat.

Academic courses relevant to the project: Object oriented programming.

PS-II Station: Harness, Bangalore

Faculty

Name: Vimal S P

Student

Name: Dhaivata Pandya(2016A7PS0020P)

Student Write-up

Short summary of work done during PS-II: I did not have any idea of web development before I joined, so I started by rewriting snippets of code to make them conformant to the configured linting rules. Later, I wrote a custom lint rule for a pattern not picked up by any existing rules. It was pretty cool, since I had to identify the pattern by traversing the AST. These exercises also helped me understand React, the codebase and frontend development in general. After that, I had to refactor an existing component, which happened to be the main feature on the website's second most visited page. It was a notoriously buggy component and the code was a mess. The refactoring was tricky - since it was a relatively long-term project, I had to incorporate new features requests concurrently. I reduced code complexity, response time and memory footprint across the board. I also made it more reliant on W3C specs and behaviours, so it allowed for minimal effort when adding support for other browsers. For good measure, I then refactored the most visited page too. I also worked on styling the documentation site for the product. It was managed by a third party service, so I was basically hacking my way around their default styling and behaviours through pure CSS and HTML scripts - bare-metal frontend development if you will. In the last third of my internship, I was included in the sprint cycle - from planning to testing. It was far more lively than I'm making it out to be, iykyk.

Tool used (Development tools - H/w, S/w): VSCode, React, Jest, JIRA, Git, Github, Docker, Harness.

Objectives of the project: To learn front-end development.

Major learning outcomes: Frontend development, React, Functional programming, Test-driven programming.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment was wonderful. I didn't know any web development, so the team sort of took me under their wing to make sure I learnt a bit of everything. They were always happy to help out, often going out of their way to make sure that my learning was unimpeded. The engineers are also pretty smart, and it was easier to ask the guy sitting next to me rather than to think about what search query to type in. The company has these weekly learning sessions, where someone would present a new technology (not necessarily being used by the company) and then we could discuss it. It also served as a way to get cross team discussion going, and good ideas often bubbled up during these sessions. They're also pretty chill about work hours, it was mainly about being in office so that you could attend meetings in person. You could take your laptop home, and the setup allowed you to work remotely without any difficulties.

Academic courses relevant to the project: Imao.

Name: MEHUL KASLIWAL(2016A7PS0043G)

Student Write-up

Short summary of work done during PS-II: I worked on the following projects,

Vanity URL – Made harness application accessible through custom subdomain URLs.

JDK Upgrade - Upgraded JDK of all the micro-services to OpenJDK-8. Built a system in which, going forward, JDK can be upgraded regularly and seamlessly for SaaS and on-premise applications.

Microsoft Teams integration - Integrated Microsoft Teams as a notification service in Harness.

Worked on Spring framework, Docker, and Kubernetes orchestration system.

Tool used (Development tools - H/w, S/w): CI/CD Tools, Spring framework, Jenkins, Docker, and Kubernetes orchestration system.

Objectives of the project: Upgraded JDK of all the micro-services to OpenJDK-8. Built a system in which, going forward, JDK can be upgraded regularly and seamlessly for SaaS and on-premise applications.

Major learning outcomes: CI/CD Tools, Spring framework, Jenkins, Docker, and Kubernetes orchestration system.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Fast growing startup, good company culture, good people to work with. Overall, its a good company to opt for and I learnt a lot at Harness.

Academic courses relevant to the project: OOP, LCS.

PS-II Station: HCL Technologies Ltd (Formerly Geometric Ltd), Mumbai

Faculty

Name: Pavan Kumar Potdar

Student

Name: SHRIJESH NILESHKUMAR MISTRY(2018H1060177H)

Student Write-up

Short summary of work done during PS-II: Contributed to the development of DFM-Pro (Design for manufacturability) software. Primary goal was to optimize the current algorithm that collect the parts that are in the vicinity of the feature of a component. At the later stage of the

internship, evaluated a tool that can be incorporated into the organization for static code analysis.

Tool used (Development tools - H/w, S/w): Visual studio, Creo parametric, DFM-Pro.

Objectives of the project: Optimize the algorithm to find the components in the vicinity of a particular feature.

Major learning outcomes: Learnt about coding in C++ using VS.

Learnt about software development.

Learnt about batch scripting.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: One of finest environment. Everyone is extremely helpful and so kind. They will help you at each and every stage; no matter how silly question you are asking. Expectations are always high for such reputed organizations but you can work more than expected because such is their working environment.

Academic courses relevant to the project: Advanced Engineering Mathematics, CFD.

PS-II Station: Histogenetics, Chennai

Faculty

Name: Bharathi R

Student

Name: ANUSHUA CHAKRABORTY(2018H1290005G)

Student Write-up

Short summary of work done during PS-II: My work at Histogenetics was to analyze and interpret NGS data of particular genes (ABO-rh). The analysis of the data was done to get blood typing. I also prepared reports for the same and also along with my project, I was involved in other projects (importance of genotyping, FC receptor and KIR inhibition mechanism and Covid-19).

Tool used (Development tools - H/w, S/w): I used the company proprietary software for the analysis.

Objectives of the project: ABO gene is highly polymorphic in nature and new ABO variants are being observed every day. The traditional serological blood typing process is helpful but fails to identify many different variants of ABO gene, this might cause transfusion reaction, haem.

Major learning outcomes: it is of utmost importance to correctly analyze the ABO gene considering the amount of variability it might have and along with serology testing further genotyping must be done to fully understand this gene.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: The working is quite good and I was able to learn a lot. People were very helpful and supportive in my team. It is very good place to learn and gain experience.

Academic courses relevant to the project: Molecular immunology.

Name: ADRIJA GANGULY(2018H1290008G)

Student Write-up

Short summary of work done during PS-II: As a part of our project, I did a research on CCR5 gene and its polymorphisms. For office work, I learnt how to analyse the NGS data using

company proprietary software and generate the typing for genes such as ABO and CCR5. After the typing, we generated reports for clients.

Tool used (Development tools - H/w, S/w): Company proprietary software.

Objectives of the project: To find the CCR5 gene and its polymorphisms around the world.

Major learning outcomes: In depth learning about the CCR5 gene, next generation sequencing and ABO/CCR5 typing.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: It was overall a good experience in learning and working. My fellow associates were very supportive and friendly. The working environment of the company has helped me boost my workplace teamwork.

Academic courses relevant to the project: Yes. My knowledge in the courses Molecular immunology and Genetics and inherited diseases helped greatly.

PS-II Station: Hourglass Research, Mumbai

Faculty

Name: Pavan Kumar Potdar

Student

Name: LOHIA JAY MAHESH(2016A3PS0204G)

Student Write-up

Short summary of work done during PS-II: Hourglass research is a very different kind of PS. Each project lasts about 3-4 days if it is infringement or prior art analysis. Patent infringement

includes finding products which infringe upon a specific patent as provided by the client. Market research includes finding market details for a specific patent provided by the client and a commercialization strategy.

Tool used (Development tools - H/w, S/w): Google patents, Orbit patent database.

Objectives of the project: Find infringing products for patents.

Major learning outcomes: Patent analytics.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Hourglass research is a very different kind of PS. Each project lasts about 3-4 days if it is infringement or prior art analysis. I did 20 infringement analysis projects. Patent infringement includes finding products which infringe upon a specific patent as provided by the client. Market research includes finding market details for a specific patent provided by the client and a commercialization strategy.

Academic courses relevant to the project: NA.

PS-II Station: HSBC (WMR/GAC/DATA SCIENTIST), Bangalore

Faculty

Name: Sidharth Mishra

Student

Name: ANIL VERMA(2018H1490358P)

Student Write-up

Short summary of work done during PS-II: Data quality rules automation.

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

Objectives of the project: To automate the dashboard building for data quality monitoring.

Major learning outcomes: Data quality is very important even for the legacy systems, to monitor for that business rules are required. These rules need to be validated with the data coming into the system. They have to be monitored continuously to enhance the quality of the data and deliver better reports for the leadership.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: HSBC working environment is very professional and they provide a buddy system for us to learn and groom.

Academic courses relevant to the project: Project management.

Name: KARTHICK S A(2018H1490393P)

Student Write-up

Short summary of work done during PS-II: I joined in a retail risk analytics team named IFRS 9 which develops models as per the International regulators (ECB, PRA, EBA, HKMA, FED, etc) directions to analyze the bank and its consumers futuristic financial state. This has various types of Qualitative, Quantitative, Stress testing model development and execution on a periodic basis considering factors like macro-economics, credit scores, ratings from external institutions, each country's financial policies and last but not the least - Expert analysis. My experience during this tenure has been in (i) developing automation scripts for quarterly portfolio analysis for continental Europe and UK regions (ii) in analyzing the macroeconomic factors for single factor model development (iii) analysis of HSBC's model of identifying significant increase in credit risk (SICR) in retail risk portfolios (iv) a detailed study of the Government interventions, banking regulator and central banks' contribution towards the economy in continental European countries in addressing the COVID-19 impacts.

Tool used (Development tools - H/w, S/w): Technically, I got exposure in SAS tool using which we develop the models, Teradata database and majorly in automating scripts using VBA in Excel.

Objectives of the project: 1. Automation of the quarterly portfolio monitoring for CE & UK portfolios, 2. Study to analyse the economic inconsistencies due to COVID-19 in retail risk analytics.

Major learning outcomes: Importance of data analytics in a financial institute. The various regulatory standards have been followed at HSBC in addressing the consumer requirements. Factors affecting the estimation of expected credit losses for a bank through their retail portfolio exposures.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: I see a very good support and monitoring system being in place for the interns at HSBC. They assign mentors at Vice President cadre / positions for each interns and we communicate directly with them regarding any of the progresses or constraints during the tenure. I got to attend all the basic required trainings about the business unit and the technical tools within first one month and then started working on the daily business requirements as per the allocation. We had a interns review committee and have been frequently followed-up from their end about the work allocations, likes and dislikes, improvement measures (if any) on a bi-weekly / monthly basis. Added on to it, this time we are all facing a BCP situation due to the COVID-19 virus spread. Even during such situation, the firm took care of each Interns' safety first than any deliverable. Also, during the country-wide lockdown, I was provided with an option of work from home on an open source project as per discussions with my manager which helped me in continuing my contributions towards the team till the last day of the Internship.

Academic courses relevant to the project: Corporate finance and techniques, Quantitative methods, Business and society.

PS-II Station: HSBC Portfolio Management Analytics (PMA), Bangalore

Faculty

Name: Sidharth Mishra

Student

Name: SRINIVAS DARAHHAUS MUDDULA(2018H1490392P)

Student Write-up

Short summary of work done during PS-II: BAU in MI reporting which deal with risk side of the issues and automating the BAU tasks done by the team using tools like python.

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

Objectives of the project: Automation of BAU.

Major learning outcomes: Understanding Python and how the risk side works from bank perspective.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Dealing with risk side reporting such as understanding major matrices associated with risk on a daily, bi-weekly and monthly depending on the internal clients request.

Academic courses relevant to the project: CFT, SAPM, Marketing research.

Name: AVINASH KAUR BHAMRA(2018H1490402P)

Student Write-up

Short summary of work done during PS-II: 1. To provide assistance to front office staff who are users of the in-house tool for forecasting profitability and risk of a proposal at the given time.

2. Preparation and distribution of management information about the pricing deals of HSBC lending portfolio to the stakeholders.

3. Verifying the developments on ORC on the final environment which will be provided to the stakeholders.

4. Strive to increase competency and subject matter expertise. Developing & building understanding of key metrics for evaluating the credit risk portfolio.

5. Prepared a visually interactive dashboard which was hosted on a cloud platform using python for global stock information.

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

Objectives of the project: To provide assistance to the relationship managers for making correct forecasts about profitability of a deal.

Major learning outcomes: Learn various banking terminologies, how is the pricing of a deal done, how is day to day work done in the business side. Learnt building dashboards using python.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is very good for the professional growth of an individual. There is no micro management by senior officials. Great emphasis is paid on building knowledge of the subject matter and increasing competency. The company expects the joiner to work on the base skills of developing & building understanding of key metrics for evaluating the credit risk portfolio. All other training and KTs are provided by them. Very encouraging about asking questions to clear doubts.

Academic courses relevant to the project: Financial and management accounting, Corporate and financial tax, Security analysis and Portfolio management.

PS-II Station: HSBC Strategic Transaction Group (STG), Bangalore

Faculty

Name: Sidharth Mishra

Student

Name: AKASH SINGH BHADAURIYA(2018H1490383P)

Student Write-up

Short summary of work done during PS-II: I got an opportunity to work with multiple teams in the strategic transaction group at HSBC. I worked with the Debt capital market team where I covered the European market and got an understanding of the process involved while a bank goes to raise capital and also got a better idea of basel norms. I also worked with North America sector coverage team and the sectors covered included Industrials, Med-tech and Oil & Gas.

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

Objectives of the project: To help banks raise capital and thereby have sufficient capital as per the basel norms. To track the evolving changes in the sector and highlight opportunities for M&A.

Major learning outcomes: Understanding of the basel norms and sector dynamics in sector coverage.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Team members are very supportive and easy to approach, higher management is also available to provide feedback and guide you through the challenges you face.

Academic courses relevant to the project: Business analysis and valuation, Corporate finance, SAPM.

Name: CHHAYA HIRAVKUMAR KIRANBHAI(2018H1490395P)

Student Write-up

Short summary of work done during PS-II: Analysed and learnt about corporates hedging strategies. Floating rate simulations to help understand how the interest rate and currency swaps are formed and pitched.

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

Objectives of the project: 1. To analyse companies hedging policies and compare them with the industry. 2. To simulate the floating interest rates and predict the nature of the same for the future.

Major learning outcomes: How country and corporate uses derivative hedging to mitigate their risks and in this process not only they consider their own exposures but competitors exposure and heading strategy as well.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment was very helpful, investment bankers have rigorous working hours but that was all worth as the team members helped in learning a lot of corporate things. On the expectations part company expected us to gel up with the team, learn from every member and understand what, how and why they do the work they do. Constantly improve by asking question and learn.

Academic courses relevant to the project: Financial engineering, Quantitative methods, Corporate finance and taxation, Business analysis and valuation.

Name: VARSHA GUPTA(2018H1490404P)

Student Write-up

Short summary of work done during PS-II: I was a part of the risk solutions business development team. I worked on the business as usual reporting and was involved in the automation projects as well. Later after the lockdown happened, we were only given projects with public data where I helped various teams. The work included projects like company profiling, sector mapping, peer analysis, etc. I was also given a long term project where I was asked to benchmark the risk solutions business of the bank.

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

Objectives of the project: To automate the BAU reports in order to reduce redundant work. To benchmark the risk solutions business with the industry leaders.

Major learning outcomes: Understanding of an investment bank and its processes.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment at HSBC is healthy and team members are also highly helpful.

Academic courses relevant to the project: Financial management and accounting, Security analysis and portfolio management, Business analysis & valuation.

PS-II Station: IDfy (formerly Baldor Technologies Pvt Ltd), Mumbai

Faculty

Name: Ankur Pachauri

Student

Name: SACHIN P C(2018H1030140P)

Student Write-up

Short summary of work done during PS-II: Worked on development of multiple applications over the course of 6 months. Worked on integrating google cloud pubsub, rabbitmq. Worked on identity providers, SAML etc.

Tool used (Development tools - H/w, S/w): Language - Elixir, Framework - Phoenix, Database - Postgres, google cloud, IDP – Keycloak.

Objectives of the project: To provide authentication and authorization to the applications build, Integrating external identity providers.

Major learning outcomes: Learnt web app development using elixir language with phoenix framework. Learnt and worked on areas like rabbitmq, google cloud pubsub and also on IDP's.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The tech team consists of around 50 employees and the kind of work done is really very good. Work is related to the new technologies and are interesting. If there is interest, can learn a lot. Not much of hierarchy is present and can approach anyone in the tech team. Good place to learn new things.

Academic courses relevant to the project: Computer programming, Data structures, Object oriented analysis and design.

Name: TAIBANI ISMAIL YUSUF RUBINA(2018H1120271P)

Student Write-up

Short summary of work done during PS-II: During first two months I have been allocated with the task to automate some journeys of the product. After this project got some feature development APIs development for a month. Then in the month of April and May got work to write unit test cases for the product using Rspec. In June again got some work to build APIs or to edit them.

Tool used (Development tools - H/w, S/w): Ruby on rails, Javascript, React, Python, Rabbit MQ, Selenium, Rspec for unit testing.

Objectives of the project: Automation of various tasks on the company's existing product.

Major learning outcomes: Learned web development and learned about large scalable projects. Team work, Communication skill improved.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Work environment was very good. Its was the open work space with no cubicals so communicate with the team member and other member a lot. got learn many things from them.

Academic courses relevant to the project: Object oriented analysis and design, Advance operating systems, Software architecture, Machine learning.

PS-II Station: IFB Industries, Goa

Faculty

Name: Narayan Suresh Manjarekar

Student

Name: PATEL VIVEKKUMAR BHARATBHAI(2018H1060159H)

Student Write-up

Short summary of work done during PS-II: Topic of the project is "Calculation of the shaft to bore misalignment of the assembly and validation of the design of existence garter seal". In this project, we have collected the sample of the field failure seal and analyze the mode of failure. We have successfully simulated the STBM for different assembly in ANSYS.

Tool used (Development tools - H/w, S/w): Ansys, VMM, Creo.

Objectives of the project: To find the STBM.

Major learning outcomes: Simulation of assembly.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Great working environment.

Academic courses relevant to the project: FEA, QUALITY CONTROL.

Name: G Y SANDESH REDDY(2018H1060162H)

Student Write-up

Short summary of work done during PS-II: We had to do FMEA analysis of the worn out seals and calculate shaft to bore misalignment of the seal because it was the prime cause for the seal failure in a washing machine which leads to complete seizure of the washing machine. We collected 125 seals and separated the seals SFN seals and used VMM machine to measure the dimensions of all the seals' lip diameters and analysed the surface of the worn out seals. ANSYS workbench was used to do transient analysis for the bearing sleeve and shaft assembly for performing analysis for various washing machine wash programmes and different STBM set and deformation on the seal and shaft for different was taken as the output for the transient analysis. After this, we had to validate our results practically using a V block and dial indicator and to check the STBM for the assembly and propose a method to reduce the STBM.

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

Objectives of the project: To calculate the STBM and propose a new seal design.

Major learning outcomes: Learned how to apply transient analysis for a real life problem.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment was good. All the employees were friendly and we had a smooth interaction with them. Our mentor was also cooperated and guided us well throughout the PS period. Initially, we were not allowed to use the company's lab and equipment and we faced difficulties in producing the results for our 1st review but as the time passed we were able to produce the required results. We expected that more work would have been done but due to lock-down and Covid -19 our work was limited to certain resources only. For the second part of our project, we had to use the lab of the company for validation of the results but due to the pandemic, we were restricted to use only software and had to rely on only software results.

Academic courses relevant to the project: Product design, Quality control.

Name: MAHAGAONKAR SAURABH SUNIL(2018H1410148H)

Student Write-up

Short summary of work done during PS-II: My project was related to optimizing a critical component (drum bracket / spider) for a more efficient design. The project consists of two major goals,

1. Simulating breaking strength of the drum and validating my FEA analysis with current results and experiment observations.
2. Redesigning the drum bracket - It involved finding which cross section suited best for our needs and then we propose few models in that direction. After deciding the shape, we then moved towards size optimization to decide the final dimensions for our product. The whole study was done on ANSYS WORKBENCH.

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

Objectives of the project: 1. Validating our FEA results with experiments. 2. Redesigning the spider part.

Major learning outcomes: 1. Learned a pretty good deal about ANSYS WORKBENCH and was able to appreciate the versatility of the software provides to the user.

2. Learned how important boundary conditions can be in FEA to get right results.
3. Learned how to simulate contact behavior in FEA.
4. Learned how to troubleshoot errors.
5. Learned a good deal about powerful meshing options in ANSYS.
6. Learned how space claim is a very handy tool for cadd modeling.
7. Learned how to parameterize models to automate process of simulations.
7. Learned how to work with design explorer in ANSYS to get a good optimised design.

Details of papers / patents: No paper or patents.

Brief description of working environment, expectations from the company:

1. The whole department here just works on CADD modelling namely CREO software.

2. These are result oriented people. So make sure you get some tangible output from your side. But again, its up to you to show interest and commitment towards work. If they see this, they will definitely keep you in the loop.

3. Learning is up to you how you make it . You can learn a lot if you are actively looking for it.

Academic courses relevant to the project: FEA, CAED (Modelling B-Splines).

Name: ASHOK KUMAR(2018H1410152P)

Student Write-up

Short summary of work done during PS-II: I am working on the concept of the dry cleaning in the domestic washing machine specially in the front loaded washing machine. Here, I am trying to attach few parts in the machine so that we can use dry cleaning process in the domestic washing machines.

Tool used (Development tools - H/w, S/w): Spectrophotometer, pro-e.

Objectives of the project: Dry cleaning concept implementation in the domestic washing machines.

Major learning outcomes: Dry cleaning and laundering process, Gap between the two and connecting root between the two.

Details of papers / patents: 1-Design of machine elements.

2-DRY CLEANING SOLVENT FILTRATION AND RECOVERY SYSTEM WITH FILTERING APPARATUS.

3-DECAMETHYLCYCLOPENTASILOXANE.

4-SILOXANE DRY CLEANING COMPOSITION AND PROCESS.

5-ASSESSMENT OF ALTERNATIVES TO PERC FOR DRY CLEANING PROCESS.

Brief description of working environment, expectations from the company: Working environment is really good and company staff is also helpful specially my mentor.

Academic courses relevant to the project: Product designing and development, CFD, FEA.

PS-II Station: InMobi - Software Development, Bangalore

Faculty

Name: Pradheep Kumar K

Student

Name: AMAN GUPTA(2016A1PS0807P)

Student Write-up

Short summary of work done during PS-II: Worked as a full stack software development engineer. Developed and maintained a unified dashboard platform using Node.js and Reactjs to ease the business flow. Built features using AngularJS to fulfill the product requirements. Also, worked on end to end projects (including dev , qa, and deployment). Worked on tools such as Docker and Kubernetes for deployment of projects. Also, used Sequelize ORM to handle database queries.

Tool used (Development tools - H/w, S/w): S/w - Javascript, Node.js, Reactjs, AngularJS, Docker, Kubernetes, Sequelize.

Objectives of the project: To build unified dashboard for the easement of business flow.

Major learning outcomes: Full stack development.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is very good. Provides great learning opportunities. Provides with latest tech stack. The work culture is also very good. The team is supportive and helpful which helps the new joiner to accommodate with the new tech stack quite easily.

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

PS-II Station: InMobi- Business Analyst, Bangalore

Faculty

Name: Anjani Srikanth Koka

Brief write-up on each PS-II station: The below mentioned are the expectations from the industry in common apart from some specific skills in a student. A student can be better prepared by practicing these skills.

1. Exposure to marketing and finance course fundamentals
2. Data analytics
3. Proficiency in Excel, Python, R, SQL
4. Soft skills

Student

Name: AVIRAL AGGARWAL(2015B2A10816G)

Student Write-up

Short summary of work done during PS-II: Worked as growth marketing and user acquisition intern for owned and operated apps of InMobi.

Tool used (Development tools - H/w, S/w): Google Ads, Facebook Ads manager, Branch, MoEngage, LiftOff, MobileAction, WeatherAds, Flurry, Excel, Powerpoint.

Objectives of the project: Getting high quality users for 1Weather app.

Major learning outcomes: Running paid campaigns, optimizing the life time value of a user against the cost of acquisition, social media marketing.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: InMobi has a brilliant working environment with flexible working hours and talented folks across all fields to help and guide you through. My team, although small and heavily work loaded, was very approachable to help me understand the basics of digital marketing.

Academic courses relevant to the project: Principles of economics, Technical report writing, Maritime studies and Blue economy.

Name: JAYANT JHAMB(2015B2A40678G)

Student Write-up

Short summary of work done during PS-II: The key objective of my tenure at InMobi was to understand the field of digital advertising at large and In-App programmatic advertising in-depth. Along with understanding the technical aspects of the business, it was required to learn the business and communication part of the programmatic dealing which would enable to serve the client better and help them grow along with InMobi. After getting the concepts of programmatic In-App advertising and vetting the InMobi exchange's system to enable the advertising, I assisted in managing demand side platforms based out of APAC region during the first half of the tenure. While performing the duties, I got the fine details of the APAC clients which are much more versatile as compared to US or Europe based DSPs and hence require dynamic efforts in maintaining the growth. Some of the major projects that I completed in the tenure are: Handovers and moving of DSPs due to strategic restructuring for better efficiency, assisting in establishing DC, planning for COVID impact on APAC DSPs and the path to tread for recovery. Along with these major projects, regular optimisations for DSPs for delivery of campaigns on

open exchange was handled by me. One of the other key responsibilities handed over to me was to maintain trackers to track the weekly spends for demand and supply sides in APAC. It included weekly analysis of the growth / de-growth of DSPs or publishers. Along with tracker updates, I have assisted account managers from supply side in getting data for publishers and forming the decks.

Tool used (Development tools - H/w, S/w): O365, InMobi internal tools, Python, Salesforce.

Objectives of the project: 1. Understand the programmatic delivery of advertising across regions via InMobi exchange. 2. Understanding the lifecycle of an ad requests and factors associated with it. 3. Manage the programmatic delivery of advertisement for the partners (Demand Side).

Major learning outcomes: 1. Client Communication 2. Strategizing business growth amongst pandemic 3. Efficiency increment for data centers 4. Business case analysis for COVID impact and chartering the way forward upon the uneven road.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Working environment in InMobi is very inclusive and joyful. The office is tastefully designed and have all the amenities that you would ever need. Along with the infrastructure, the team structuring is also very unique in InMobi. The teams have heirarcy on the paper but you will not feel it in real life. I have interacted freely with my 2 to 3 level senior bosses very frequently and have also enjoyed having some downtime with them. Though this COVID situation has kept us out of office for half of the duration. But in work from home model also, InMobi has been quite good equipped and every team member has put in the efforts to support the cause and rebound from the slump.

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

Name: Rohit Mandar(2016D2PS0988P)

Student Write-up

Short summary of work done during PS-II: Worked as a part of the InMobi marketing team for the promotions of the organization and to drive new contacts and leads for APAC (Asia Pacific) region. As the subparts of it, my role is to work for reporting, analysis of the campaign results to provide better outcomes, competitor intelligence work to understand the market position of InMobi.

Tool used (Development tools - H/w, S/w): HubSpot, Youtube, LinkedIn, Google analytics, Excel, MS-PowerPoint, Video editor.

Objectives of the project: To improve the performance and drive new contacts / leads.

Major learning outcomes: Hands-on analytics experience, Improved my excel skills, learned to deal with project deadlines, improved understanding of the market from an organization perspective.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: An amazing working environment with friendly teams. People here are really good and helpful. A very collaborative approach is followed in the team to get optimal results. Seniors are quite eager to help and mentor the newbies. One great thing is that you are given ownership for the work you handle and you are free to experiment things.

Academic courses relevant to the project: Digital marketing, Marketing research, Technical report writing.

Name: RAJAT SINGH PARIHAR(2018H1420205P)

Student Write-up

Short summary of work done during PS-II: I was working in Wadogo department on revenue management and margin optimization for InMobi.

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

Objectives of the project: To enhance my learning in the field of digital marketing and affiliate management.

Major learning outcomes: Got to learn about revenue management and client services, managed publishers and advertisers with an intent to maximize margin and revenue for InMobi.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Work environment was very good, every one was very friendly and helpful gave good learning.

Academic courses relevant to the project: Supply chain management and lean manufacturing.

PS-II Station: Intel India Technology, Bangalore

Faculty

Name: Swapna S Kulkarni

Student

Name: ABBAS ALI PANSARY(2015B3A30603P)

Student Write-up

Short summary of work done during PS-II: The work involved software development, Object oriented programming and understanding the graphics pipeline.

Tool used (Development tools - H/w, S/w): C++, Python, C#, Visual studio.

Objectives of the project: The objective of the project was to develop and debug the software used for validation and debugging of Intel's graphics processor.

Major learning outcomes: Understanding of the graphics pipeline, Hands on software development.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Very motivated and educating environment. Students are encouraged to follow project that challenge them and provide learning experience to further one's career.

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

Name: DHANDHALYA BHAVIK BHASKERBHAI(2018H1030118P)

Student Write-up

Short summary of work done during PS-II: I was given deep learning work where I have to optimize deep learning architectures for Intel hardware. ex. ResNet18. There are several algorithms available so I was given a work to apply one of those algorithms.

Tool used (Development tools - H/w, S/w): Pytorch, Intel's OpenVINO toolkit for deep learning tasks.

Objectives of the project: Optimization of deep learning neural networks for given Intel's hardware.

Major learning outcomes: Optimization of deep learning network.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment was the best. My team helped me a lot with every challenge I had.

Academic courses relevant to the project: Machine learning.

Name: NISHAT ZAMAN(2018H1030126P)

Student Write-up

Short summary of work done during PS-II: The main objective of the project is to first explore the 5g end-to-end setup using an opensource 5g core network and also understand the traffic influence services of NEF (Network Exposure Function) present in Intels' OpenNESS (Open Network Edge Services Software) and then finally integrate both these systems for Network Edge Deployment scenario. Worked on this integration of OpenNESS with an open source 5g core network. All the 5g components were written in Golang. I was involved in implementing the rest clients at OpenNESS side to communicate with the network functions present at 5g core side. Wrote two http rest clients for OpenNESS NEF to communicate with PCF (Policy Control Function) and UDR (Unified Data Repository) of 5gc. Also wrote unit test cases for these rest clients in Ginkgo testing framework of Go. Achieved 81% code coverage with it. Finally, I had to set up OpenNESS experience kit on a virtual machine for Network Edge mode to perform integration test of the entire software.

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

Objectives of the project: Integrate Intel's OpenNESS with an opensource 5g core network (free5gc) for traffic influence services.

Major learning outcomes: Understanding of 5G core network, Multi-access edge computing (MEC) architecture, Golang, Kubernetes.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is very good here at Intel. Everyone is very helpful. We regularly had knowledge share sessions and sync up meetings among our team members which were very insightful.

Academic courses relevant to the project: Cloud computing, NEA (Network Embedded Application).

Name: ANUPA ANN JACOB(2018H1030142P)

Student Write-up

Short summary of work done during PS-II: Worked on implementation of mutual TLS on a disaggregated storage management system, validation and automation for Intel Optane data centre persistent memory modules.

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

Objectives of the project: Implement security for inter-component communication in a cloud system, Understand and validate the firmware features of Intel's brand of persistent memory.

Major learning outcomes: Learned about mutual TLS and its implimentation, persistent memory architecture / firmware and python scripting for automation.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: It was a large team having people at varying levels of experience and expertise in different areas. Team members were quite supportive and the work culture encourages learning.

Academic courses relevant to the project: Network security, Advanced computer architecture.

Name: AKHIL BHUJLE(2018H1230146G)

Student Write-up

Short summary of work done during PS-II: A test flow for register validation at SOC level using C based tests was developed. A python script was developed to automate the test generation. Test APIs were written in C language. Register validation was carried out on assigned subsystems using this flow on integrating it with existing UVM Testbench. Cleanup & update of an existing UVM testbench was carried out for reuse in current project.

Tool used (Development tools - H/w, S/w): Synopsys Verdi, Python, C, System Verilog and UVM.

Objectives of the project: SOC Validation.

Major learning outcomes: Got a good exposure on SOC validation flow & UVM based test environment for SOC verification.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment was supportive in terms of learning new concepts / tools etc. Learning was encouraged throughout the internship period. Every one on the team was very approachable & supportive and even simplest doubts were cleared by colleagues, mentor & manager.

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

Name: Bambhaniya Mihir Rajabhai(2018H1230147G)

Student Write-up

Short summary of work done during PS-II: Static timing analysis in dft modes for particular design and fix violations and exceptions to run at a particular frequency.

Tool used (Development tools - H/w, S/w): Primetime, GCA (Galaxy Constraint analyzer).

Objectives of the project: Finding timing violations and WNS (Worst negative slack) and find why this path is violated and reasons behind that. Sta perform in two dft modes shift and capture so we deal with these two modes for execute timing setup.

Major learning outcomes: How scan look like into design, clock network propagation in design, frequency of operation for given design and deal with various exceptions.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Good to working on unix and shell.

Academic courses relevant to the project: Vlsi design, Vlsi archi, Test & testability.

Name: Rashi Pandey(2018H1230150G)

Student Write-up

Short summary of work done during PS-II: Worked on physical design using Intel confidential flow methodology. Every stage worked in detail and depth.

Tool used (Development tools - H/w, S/w): ICC II, VNC, TCL scripting, INNOVUS.

Objectives of the project: To optimize our design.

Major learning outcomes: Scripting learning, Debugging skills.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Intel has very friendly environment where even interns are treated as equal as an employee. work culture emphasises on learning and access to tools.

Academic courses relevant to the project: VLSI design, CAD for IC design, Cadence physical design.

Name: Siddanth Jain(2018H1230177G)

Student Write-up

Short summary of work done during PS-II: The very important purpose of the work was to understand and analyze interconnections associated with server system on chips. The project was mainly towards implementation of fabrics for the effective on chip communication such as register access, interrupt, security, power management and other important events between the processor units and IPs. The motivation of this project was to design and implement the standard interconnection fabric and reuse across multiple designs.

Tool used (Development tools - H/w, S/w): Company specific tools, Commands and scripts.

Objectives of the project: To implement on chip system fabric for efficient communication between processor units and IPs.

Major learning outcomes: RTL integration and interconnections associated with server SoCs.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: Intel is an amazing place to work and perfect place for work life balance. It is indeed great experience working with people of high knowledge. Interns are treated like regular employees. Technical exposure is really good and it finally depends on the individual interests. The company has got projects across different domains. The opportunities at the company are limitless.

Academic courses relevant to the project: Digital electronics, VLSI design, Advanced VLSI design, System verilog, VLSI test and testability.

Name: PALLAB PRAN DUTTA(2018H1230222H)

Student Write-up

Short summary of work done during PS-II: As an intern in DFT team, my objective was to analysis and debug different partitions and subsystems for improving test coverage. My responsibilities included learning simulation tools, work environment, do literature survey for understanding the problems, then start the analysis on partition and subsystem level. ATPG, pattern simulation, fault analysis and dualsim analysis for nine partitions and one subsystem were done and a very good test coverage was achieved. The reason for drop in test coverage were analyzed and different experiments were conducted to improve the coverage numbers. The patterns for all the nine partitions were verified in full chip level simulation.

Tool used (Development tools - H/w, S/w): DFT visulazier, Tessent TestKompress, Tessent FastScan, Verdi, System verilog, TCL.

Objectives of the project: ATPG, Pattern simulation and fault analysis for network servers.

Major learning outcomes: DFT flow and methodologies, ATPG, hands on experience on industry level tools for DFT, debugging issues related to DFT at partition level, techniques to achieve better coverage for an SOC.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The work environment in Intel is great. The company provides a great learning curve. All the employees are equally approachable. Seniors are supportive and they guide us. There is no difference between intern and regular employee, everyone is equally encouraged to pursue a task and support is provided to complete it successfully.

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

Name: ADITI BAGRIYA(2018H1230224H)

Student Write-up

Short summary of work done during PS-II: I have worked in verification department of the PSG group where we worked on Universal Verification Methodology (UVM). The UVM package is an open-source SystemVerilog library, which is used to set up a class-based hierarchical testbench. UVM testbenches improve the reusability of Verilog testbenches. After the regression test is done, I run the perl script on the UVM error file to find the expected and unexpected error.

Tool used (Development tools - H/w, S/w): Linux, VCS, VNC, Perl, System verilog, UVM.

Objectives of the project: To verify the DUTs given by the design team.

Major learning outcomes: Learned about corporate culture, Implementation of different class of UVM for verification, Perl scripting.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: As big as to work in company like Intel there are so many possibility to know about what's going on in the industry and how to mend yourself in a corporate culture.

Academic courses relevant to the project: Application of Verilog and different courses of ME are one way or another useful in project.

Name: MEHTA DHRUV ASHWIN BHARTI(2018H1230229P)

Student Write-up

Short summary of work done during PS-II: I have worked on two projects one related to validation and other related to RTL integration.

Tool used (Development tools - H/w, S/w): RTL connectivity tools, System Verilog, Other front end Tools for hardware design.

Objectives of the project: Merging of multiple partitions into single partition in order to exploit tool capability.

Major learning outcomes: Front end design flow, Design for debug basics.

Details of papers / patents: No paper was published.

Brief description of working environment, expectations from the company: Working environment is quite good.

Academic courses relevant to the project: Yes. few academic courses were relevant.

Name: SAHIL JAKHAR(2018H1230232P)

Student Write-up

Short summary of work done during PS-II: Worked on SD convergence of a server SoC partition, got understanding of flows used in the VLSI industry. Learnt about Synthesis and APR. Tools used for the implementation were ICC2. The second task that was allocated was clocking implementation for SoC partition. Tool used were ICC2, clock simulator.

Tool used (Development tools - H/w, S/w): ICC2, Clock simulator, Synopsys tools.

Objectives of the project: SD convergence and Clocking implementation for a server SoC partition.

Major learning outcomes: Learnt clocking methodologies, ICC2 tool usage, Different APR flows.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment enables you to have learning along with working on the project. Team members are cordial.

Academic courses relevant to the project: Advanced VLSI design, VLSI design, CAD for IC design.

Name: SHIVAM KAUSHIK(2018H1230241P)

Student Write-up

Short summary of work done during PS-II: Synchronization techniques like use of 2-D Flip Flop / N-D Flip Flop, Implications of CDC like re-convergence, Look ahead clock gating to reduce dynamic power dissipation.

Tool used (Development tools - H/w, S/w): VCS, Verdi, Spyglass CDC.

Objectives of the project: High bandwidth memory IP feature implementation.

Major learning outcomes: Synchronization techniques, Data bus inversion, Extending channel addressing support in PHY.

Details of papers / patents: Still ongoing regarding Look ahead clock gating. Need to collect power result from ptpx tool.

Brief description of working environment, expectations from the company: Working environment is friendly and supportive.

Academic courses relevant to the project: VLSI design, Advance VLSI design.

Name: ABHILASH RAI(2018H1230242P)

Student Write-up

Short summary of work done during PS-II: I have worked on board designing of Long range (LoRa) gateway module. My work involves creation of BOM (Bill of Materials) according to design requirement which requires feasibility study of major components, schematic entry, netlist creation and PCB layout.

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

Objectives of the project: Development of standard interface for connecting high speed components for wireless communication.

Major learning outcomes: Understanding of various platform architecture which includes,
1. Centralized platform resource (arbitrer, memory subsystems and traffic flow).
2. System platform states.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work environment is pretty chill. Team members are always onboard to help us despite of time crunch.

Academic courses relevant to the project: Advanced VLSI architecture and AICD.

Name: ROHIT KUMAR(2018H1230243P)

Student Write-up

Short summary of work done during PS-II: I have worked on Emulation model build & debugging issues related during emulation model bring up. To do post processing steps after model build & do basic checks.

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

Objectives of the project: Emulation model build of intel SoC.

Major learning outcomes: Perl, Python, Tcl.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment in intel is good. They provide all access to servers right from joining. Manager, mentor & team members were really very helpful.

Academic courses relevant to the project: Vlsi architecture, Reconfigurable computing, VTT, VLSI design.

Name: VISHAL SINGH MANDLOI(2018H1230244P)

Student Write-up

Short summary of work done during PS-II: Worked on design for testability in the front end domain. The work focused on boundary scan in particular (scan chain insertion, boundary scan description language). Also learned about DDR memories.

Tool used (Development tools - H/w, S/w): Synopsys Verdi, Emacs, UNIX environment.

Objectives of the project: Memory interface design.

Major learning outcomes: Front end design flow.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Good working environment. Team is supportive.

Academic courses relevant to the project: CAD for IC design, VLSI test and testability.

Name: RAJAT PORWAL(2018H1230249P)

Student Write-up

Short summary of work done during PS-II: My work involves Front end verification of double data rate (DDR) IP. I did performed verification of design for testability (DFT) features in the project and worked on Formal verification tools too. Also, worked on modifying the perl scripts for the verification purpose and using up the OVM environment.

Tool used (Development tools - H/w, S/w): Synopsys Verdi tool, Cadence JasperGold, Verification app tool.

Objectives of the project: To provide a high speed interface between external DRAM device and Memory controller inside the SoC.

Major learning outcomes: Understanding of Open Verification Methodology (OVM) environment and perl scripting.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: It is great to work and grow at INTEL along with the flexible work timings leading to decent work life balance.

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

Name: SAURABH TOMAR(2018H1230250P)

Student Write-up

Short summary of work done during PS-II: 1. Got understanding of physical design flow from RTL synthesis to layout.
2. Performed block level implementation starting from floorplanning, placement CTS and routing.

3. Got an understanding of various design methodologies to perform various technique to optimize timing and area constraints.
4. Worked on 10nm technology node.

Tool used (Development tools - H/w, S/w): Design compiler, ICC2, Primetime.

Objectives of the project: 1. To complete the RTL to GDS2 flow for the given block of the design.

Major learning outcomes: 1. Physical design flow 2. ASIC flow 3. UNIX 4. Shell scripting.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment was as per my expectation as it helped me a lot in providing various resources and access of tools to help in performing work related tasks, team members were supporting and helpful in encouraging me towards learning and debugging problems. Manager was quite helpful and inspiring to learn various aspects of the internship.

Academic courses relevant to the project: VLSI design, CAD for IC design, Advanced VLSI design.

Name: NIMISHA SINGH(2018H1230256P)

Student Write-up

Short summary of work done during PS-II: I am working in the emulation team and specifically in design for debug so basically I am generating a debug sequence and enabling it with different features such as low power consumption etc., besides this have understood perl and got to know about the server architecture.

Tool used (Development tools - H/w, S/w): Zebu tool- ZSE4.

Objectives of the project: Project was to make me understand more in the emulation and in the dfd domain.

Major learning outcomes: Got to know about various fabrics of dfd the architecture of previous servers, perl language etc.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is great but still want to explore more on this as lockdown forces us to complete most of our internship in doing work from home only.

Academic courses relevant to the project: None.

Name: ASHUTOSH TRIPATHI(2018H1230258P)

Student Write-up

Short summary of work done during PS-II: Learned physical design flow for partitions. Used the knowledge to work on the proof of concept for merging partitions of a SoC.

Tool used (Development tools - H/w, S/w): DC compiler, IC compiler and Primetime.

Objectives of the project: Learn the physical design flow specific to Intel and Merge partitions into one which is beneficial in reducing the resources required for physical design of a SoC.

Major learning outcomes: Physical design flow for Intel. Synopsys tools namely DC compiler, IC compiler and Primetime.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment is relaxed and task delivery is the most important aspect. People are friendly and approachable. Help is always available when students get stuck on something but students should be able to learn concepts themselves.

Academic courses relevant to the project: CAD for IC design, VLSI design.

Name: Chidvilas B(2018H1400129G)

Student Write-up

Short summary of work done during PS-II: I was involved in Emulation based validation in the Data center group. A Server processor (CPU) is one of the main components in Next generation servers where all the computations required to complete various tasks assigned to them are performed. So, to validate such a complex SoC with just simulation will consume a lot of time. Emulation based validation achieve stiff time-to-market and performing satisfactory functional verification of such large ASIC/SoC. I was involved in validating a individual sub-system where different operations involved in that system at SoC level was validated. There were test contents which were ran to create an obj which gets loaded on to Emulator. Also different trackers were generated which helped in verifying whether the actual operation took place or not. I also learnt so many ways to debug an issue, so that we are successful in finding the bug at pre-silicon phase only which reduces the silicon cost to the company.

Tool used (Development tools - H/w, S/w): Python 3, Perl, Shell scripting, C++, Zebu server 4 Emulator, Verdi waveform viewer, Emulation flow.

Objectives of the project: The main objective is the Emulation based validation of the server SoC.

Major learning outcomes: Different Emulation based validation flows, Scripting languages, tool flows and debug methodologies.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment was very positive and encouraging and everyone around was very helpful, my mentors were very supportive. The internship helped me to expand my horizons in terms of technical as well as soft skills.

Academic courses relevant to the project: Object Oriented programming, VLSI design, Computer architecture, Python, C++, Device driver, Embedded systems.

Name: ANIRUDH C(2018H1400175P)

Student Write-up

Short summary of work done during PS-II: I was a part of the SOC hardware security assurance team. It involved generation of testpoints and checkpoints related to security and access control related aspects of the IP's in the SOC. The testpoints are given to the validation team to generate testcases in system verilog to check the security policies.

Tool used (Development tools - H/w, S/w): Sysytem verilog and UVM. VCS and VERDI tools are used for simulation and debug.

Objectives of the project: Identifying security flaws at the design stage itself and validate them so that the SOC is not hackable.

Major learning outcomes: Architectural details of the SOC, SOC RTL design, UVM.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment is very conducive and friendly. Even interns are treated as full time employees and have access to almost everything. You can approach anyone for help. Also you're expected and

encouraged to ask questions to clarify your doubts. Team-members also hangout in groups which increases bonding.

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

Name: SITAPARA PALAK NARENDRABHAI(2018H1400177P)

Student Write-up

Short summary of work done during PS-II: Worked on clock domain crossing verification of IP & SOC level and RTL linting using Synopsys tool and tool is automated using perl scripts.

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

Objectives of the project: Requirements of quality checks for RTL before handing over it to backend team.

Major learning outcomes: Learnt CDC checks, lint quality checks at IP level, CDC level and their importance where they do come in picture of RTL design flow and got an idea on how tool is automated using perl scripts.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: At intel, it is great to work and grow.

Academic courses relevant to the project: Advanced VLSI design, VTT, VLSI design.

PS-II Station: Intel India Technology, Hyderabad

Faculty

Name: Swapna S Kulkarni

Student

Name: KANDURU ROHITH(2018H1230214H)

Student Write-up

Short summary of work done during PS-II: 1) Learnt timing flow, static timing analysis, setup and hold violations, hierarchical timing analysis.

2) Triggered the flat runs in stage-wise by collecting the info from subfc owners.

3) Reported the referred subfc run ward areas after each run completes along with the reports generated as others will start their timing analysis on their subfc's.

4) Generated UCR summary for each run and send the UCR counts to the team.

5) Did Netlist comparison and timing comparison for each run and discuss the same with my team.

Tool used (Development tools - H/w, S/w): 1) Synopsys- VC static shell tool (Veridi compiler)

2) Cadence- Conformal tool 3) pt_shell.

Objectives of the project: To trigger the timing runs and monitor them in each stage and also do analysis on the run reports for a partition.

Major learning outcomes: 1) Learnt how to perform low power checks on Synopsys- VC static shell tool (Veridi Compiler).

2) Also learnt how to do FEV- Formal equivalence verification on Cadence- Conformal tool to check the Non-equivalents.

3) Triggered both prects and postcts timing runs and monitored the run in each stage.

4) Analyzed the run reports for a partition by loading the session in pt_shell and doing the timing analysis.

5) Wrote a script to automate some part of the run analysis and also looking forward to writing some more as that time can be used for something more productive.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: 1) Triggered timing runs and analysed the run reports for a partition and in case of errors gave fixes to the partition owners.

2) Wrote an automated script in shell-scripting which will automate some part of the run analysis and also looking forward to writing some more as that time can be used for something more productive.

3) Perl scripting or shell scripting helps in saving a lot of time in my work. In general, any automation in many Industries is much needed nowadays for the fast growth of an organization.

Academic courses relevant to the project: VLSI design, CAD IC design and VLSI architecture.

Name: SHRENEE SHARMA(2018H1230215H)

Student Write-up

Short summary of work done during PS-II: Learning protocols such as: AMBA, AXI; Learning programming languages: System Verilog, Scripting languages.

Tool used (Development tools - H/w, S/w): DVE tool by Synopsys, Verdi tool by Synopsys, VPD by Synopsys.

Objectives of the project: To design test cases for a particular IP, To design assertions for test cases.

Major learning outcomes: Learnt scripting languages, System Verilog, AXI protocol.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work environment is good and healthy learning always prevails in office.

Academic courses relevant to the project: VLSI architecture, Digital electronics, STA.

Name: ANIBHA ATUL YAWALEKAR(2018H1230216H)

Student Write-up

Short summary of work done during PS-II: I learnt formal equivalence verification concepts and its importance in VLSI design flow. Responsible for checking the FEV results for 5 partitions and providing feedback to the concerned team regarding the same. Also post midsem, I was placed in another project where I learnt about timing concepts. Also, learnt how to analyse timing violation in the design in tool. DRC is another part that I learnt. How to check for these DRC in the design.

Tool used (Development tools - H/w, S/w): Synopsis fusion compiler, Synopsis primetime, Cadence conformal.

Objectives of the project: FEV (Formal Equivalence Verification) deals with verification of netlist to identify the logic equivalence among all the stages like RTL, synthesis and APR. Timing and DRC are 2 signoff critical parameters for any chip in the signoff process.

Major learning outcomes: Timing concepts and debugging, FEV concepts, Debugging and testing.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment at Intel, Hyderabad is very pleasant. There is a tough schedule but overall a very nice experience.

Academic courses relevant to the project: ME Microelectronics 18-20 courses fairly well synchronized with company requirements and hence are proving very useful in terms of knowledge base.

Name: ANKITA PAUL(2018H1230218H)

Student Write-up

Short summary of work done during PS-II: I studied the AXI bus protocol document thoroughly and presented the AXI spec to the team. Created a test plan / verification plan which includes various scenarios to verify the bus protocol. And according to the test plan, I wrote the test cases i.e code in system verilog to verify the design under test (DUT).

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

Objectives of the project: To verify the design under test i.e AXI bus protocol.

Major learning outcomes: Understood data communication between different blocks on a chip, learned various tools, how to debug, visualization in waveforms.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is very challenging, team members are supporting and learnt a lot from the real time project.

Academic courses relevant to the project: VLSI architecture.

PS-II Station: Intercontinental Consultants and Technocrats Pvt. Ltd., New Delhi

Faculty

Name: Mahesh K Hamirwasia

Student

Name: PHADATARE AMIT RAJENDRA(2018H1300075P)

Student Write-up

Short summary of work done during PS-II: Different project documents like inception report, quality assurance plan, feasibility study report, land acquisition & clearances I report, detailed project report, technical schedules, draft 3(D) publication report, and clearances II report were studied during the training session at ICT Delhi. For example, the inception report, feasibility report and detailed project report (DPR) of Vadodara-Mumbai expressway including spur to JNPT under NHDP phase-VI project as well as the technical schedules of Bundelkhand expressway (From Kaohari to Baroli Kharka, in state of Uttarpradesh) project were examined. After this, I was acquainted with the design software viz., MX road for designing a two-lane road from Rewa to Shahdol (Madhya Pradesh) of approximately 10 km stretch under the guidance of Mr. Jogesh (Senior Highway Designer, ICT). Eventually, DPR (Traffic survey and analysis volume) of Chitrakoot-Majhgawa-Satna-Maihar (NH135BG) was also studied and various traffic surveys such as classified volume count, origin-destination survey, speed delay survey, axle load survey, etc. were analyzed.

Tool used (Development tools - H/w, S/w): MX road, Google earth, MS office, Arc GIS.

Objectives of the project: 1. To understand the various design standards and codes used for project. 2. To get exposure to the real time project implementation. 3. Enhance the knowledge about various reports prepared before execution of project. 4. Improve relevant skills.

Major learning outcomes: Understood the design process of 2-lane highway in MX road software. I came to know the significance of traffic surveys and understood how to analyze survey data. I also got to know about various specifications in the IRC code.

Details of papers / patents: Rather than PS-II report, no paper was written and published during PS-II.

Brief description of working environment, expectations from the company: ICT provides specialized design services as well as construction supervision services for all types of road projects. Various aspects of design services such as traffic surveys, geotechnical investigations, detailed engineering design, cost-estimates & tender documentation and techno-economic studies were analyzed amid the training in both highway division and traffic division. In spite of this progress, the following key issues were encountered during the study of design services,

- Use of outdated software especially MX Road for highway design purpose
- Fewer employee training programs
- Adoption of traditional equipment for surveying
- Negligence towards the impact of COVID-19 (pandemic) on current and future design studies.

In ICT, there is a friendly working environment one can ask the queries to anyone in the department and they respond very well.

Academic courses relevant to the project: Transportation system planning and management, Traffic engineering, Pavement design.

Name: PHADATARE AMIT RAJENDRA(2018H1300075P)

Student Write-up

Short summary of work done during PS-II: Different project documents like inception report, quality assurance plan, feasibility study report, land acquisition & clearances I report, detailed project report, technical schedules, draft 3(D) publication report, and clearances II report were studied during the training session at ICT Delhi. For example, the inception report, feasibility report and detailed project report (DPR) of Vadodara-Mumbai Expressway including spur to JNPT under NHDP phase-VI project as well as the technical schedules of Bundelkhand expressway (From Kaohari to Baroli Kharka, in state of Uttarpradesh) project were examined. After this, I was acquainted with the design software viz., MX ROAD for designing a two-lane road from Rewa to Shahdol (Madhya Pradesh) of approximately 10 km stretch under the

guidance of Mr. Jogesh (Senior highway designer, ICT). Eventually, DPR (Traffic survey and analysis volume) of Chitrakoot-Majhgawa-Satna-Maihar (NH135BG) was studied and various traffic surveys such as classified volume count, origin-destination survey, speed delay survey, axle load survey, etc. were also analysed. Besides, in pavement materials & geotechnical department, I got well versed with IITPAVE software which is utilised to perform structural analysis of pavement.

Tool used (Development tools - H/w, S/w): IITPAVE, MX Road, Google earth pro, GeoSLOPE, MS excel.

Objectives of the project: 1. To understand the various design standards and codes used for project. 2. To get exposure to the real time project implementation. 3. Enhance the knowledge about various reports prepared before execution of project. 4. Improve relevant skills.

Major learning outcomes: Throughout the training period in various divisions such as highway, traffic & transportation and pavement materials & geotechnical, I have analysed various design operations like designing of highway using MX Road program, identification of traffic locations, analysis of traffic surveys and pavement design using IITPAVE program.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: ICT provides specialized design services as well as construction supervision services for all types of road project. Various aspects of design services such as traffic surveys, geo-technical investigations, detailed engineering design, cost-estimates & tender documentation and techno-economic studies were analyzed amid the training in both highway division and traffic division. Work done is appreciated by the senior people in office this is the best part of ICT.

Academic courses relevant to the project: Highway construction practices, Pavement materials and design, Traffic engineering, Transportation planning.

PS-II Station: ION Energy, Mumbai

Faculty

Name: Manoj Subhash Kakade

Student

Name: SACHID AGGARWAL(2016A4PS0284G)

Student Write-up

Short summary of work done during PS-II: My work is related to mechanical design engineering of battery pack. The structural design of battery pack enclosure, holding the cells together, thermal management system, connection of cells in series and parallel and integration of battery electronics summarizes my work.

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

Objectives of the project: Design the whole battery pack system for customers. Performing DFMEA, tolerance stack up analysis, structural analysis, making engineering drawing and BOM.

Major learning outcomes: Understanding of design for manufacturing, thermal design aspects of battery packs, engineering drawing understanding, tolerance stack up analysis and structural design engineering understanding in plastics and sheet metal.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: The company has a typical startup culture. The work environment is amazing. All round mechanical engineering development can be expected from ION.

Academic courses relevant to the project: Almost all mechanical CDC are relevant except for KDM and PMFM. Even knowledge of IC engines is useful to a certain extent.

PS-II Station: IQVIA, Bangalore

Faculty

Name: Bharathi R

Student

Name: KHETAN KRUSHNA RAJKUMAR(2018H1080298P)

Student Write-up

Short summary of work done during PS-II: In IQVIA, we got to do secondary research of market data and provide the latest update if any. There are certain internal projects that were for organization itself and some are for the clients. Both were provide productive learning outcome and can develop various skills.

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

Objectives of the project: To understand the pharma market by various perspectives by using various analytical models like competitive intelligence.

Major learning outcomes: Get knowledge about pharma market giants and their market strategies to stay on road in competitive market. Also learn about how to leverage the new technological revolution in pharma market via AI, ML tools. Working on MS excel, powerpoint provides many ideas on data analysis skills and populating the data for required project. The understanding of professionalism in organization is one of the major learning outcome.

Details of papers / patents: No such outcome from secondary desk research.

Brief description of working environment, expectations from the company: Working environment is really very nice and all team members are very friendly in nature, though due to COVID-19 situation, the major part of PS is working from home and no in-person communication but this does not affect the efficiency of work because of the support from team members. During PS, we got to work with various team members of different nature like some

expect 100% perfection in a very short period of time, though we were not at all familiar to market analysis desk work this situation is also a part of learning.

Academic courses relevant to the project: No course is relevant at all, except our familiarity with pharma terminologies.

Name: JYOTSHNARANI SAHOO(2018H1460245H)

Student Write-up

Short summary of work done during PS-II: Charting and reporting recent month's survey data in the client deliverable. Doing quality control checks for the reports. Doing custom market research which includes designing of questionnaire, content QC, developing ghostpack, charting data and reporting.

Tool used (Development tools - H/w, S/w): Microsoft powerpoint, excel, word.

Objectives of the project: Understanding the need and importance of market research in health care sector using human data sciences.

Major learning outcomes: Market research using primary intelligence, Brand impact, Custom market research.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: The work culture is great. Somedays, I do overwork myself, but it's okay, I get to learn new things.

Academic courses relevant to the project: Biostatistics.

Name: MADIHALLI SHREYANK MAKARAND(2018H1460246H)

Student Write-up

Short summary of work done during PS-II: My PS-2 at IQVIA included variety of projects like KOL profiling, capturing of data from different regions around the world for different projects, link testing and logic testing, Internal projects from IQVIA like under-performing drugs, studying the impact of COVID-19 on various industries and new strategies to combat the same, preparation of interview transcripts and other projects which involved secondary research.

Tool used (Development tools - H/w, S/w): Microsoft word, Microsoft excel, Microsoft powerpoint.

Objectives of the project: Primary and secondary desk research on various projects.

Major learning outcomes: Primary desk research, secondary desk research, time management, project management.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Being in primary intelligence team, the work culture is fine and the staff is very supportive. They align you across different projects, so you can learn different things within a short time-span.

Academic courses relevant to the project: Quality assurance and regulatory affairs, Pharma. admin and business management.

PS-II Station: IQVIA, Gurgaon

Faculty

Name: Bharathi R

Student

Name: MANI FAMTA(2018H1080294P)

Student Write-up

Short summary of work done during PS-II: I have worked in various projects relating to primary custom and syndicated market research. Helped co-workers in finding out meaningful insight from the data recieved. Which further can be represented to the client.

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

Objectives of the project: To learn about primary market research.

Major learning outcomes: Data mining, data interpretation and data representation.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: IQVIA has a very friendly and joyful environment. All the co-workers are very patient with the new joinees and know their limits.

Academic courses relevant to the project: Yes.

PS-II Station: ITC Limited, Kolkata

Faculty

Name: Benu Madhab Gedam

Student

Name: Shashank Kumar(2018H1410106G)

Student Write-up

Short summary of work done during PS-II: I have been assigned the project of cost prediction before joining in the plant. I have to find the cost of manufacturing of items such as soap, shampoo etc, for different SKU size. I calculated the power consumption in soap plants for all the products using linear regression. I also did some extra work, which included automating and standardizing the daily production report, getting quotation and vendor development for buying machine, data analysis project to provide insightful knowledge from the data and few others which would help the organization in saving cost and improve efficiency.

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

Objectives of the project: The main objective behind the project was to help the organization in cost estimation to determine the cost of the products made and thus increase the profits. The main motive of the organization was to reduce cost of manufacturing by finding the best price.

Major learning outcomes: I learned about the processes involved in manufacturing of soaps and other personal care products, about the machinery used in manufacturing and packaging of products. I learned to use data to get precious information from it. I got myself bettered in working in excel using formula and VBA. Also, I developed managerial skills while dealing with people, leadership quality when working without any guidance, negotiation and communication skill while dealing with vendors.

Details of papers / patents: Using the data, I came to the conclusion that the average cost of production decreases with increase in production, thus cost of manufacturing is reduced.

Brief description of working environment, expectations from the company: I was assigned to work in ITC personal care plant in Haridwar. There were 3 division mostly, processing areas, packaging area and administrative area. Since, My work mostly deal with data, I used to work in administrative area.

Academic courses relevant to the project: My master courses were not relevant, but work done were somewhat related to bachelor program. It was related to data science skills I learned on my own.

PS-II Station: John F Welch Technology Center (GE), Bangalore

Faculty

Name: Shashank Mohan Tiwari

Student

Name: Simron(2018H1410103G)

Student Write-up

Short summary of work done during PS-II: The work included a detailed feasibility study on the direct current potential drop technique (DCPD) and its use for several types of crack growth characterization on different materials to aid the development of a DCPD test facility. Further, a CFD project was also assigned to simulate a cold spray repair process.

Tool used (Development tools - H/w, S/w): ANSYS Fluent, ICEM.

Objectives of the project: Laboratory development; Determination of tolerance zone for Design of Experiment (DOE).

Major learning outcomes: Advanced CFD Modeling- experience on discrete phase modeling (DPM).

Details of papers / patents: NIL.

Brief description of working environment, expectations from the company: Prompt and regular bi-weekly connect with the team; adherence to safety guidelines; completion of all mandatory safety trainings before commencing any lab-based work.

Academic courses relevant to the project: Computational fluid dynamics, Fracture mechanics.

Name: TANDEL SHREYAS RAMESHBHAI(2018H1410149P)

Student Write-up

Short summary of work done during PS-II: Mesh adaptation has been proven to be very efficient for simulating computational fluid dynamics applications. In this project, the pre-requirement for mesh adaptation has been mentioned and explained. CGNS is a well-established, stable format with worldwide acceptance, use and support. CGNS provides seamless communication of data between applications and CFD codes. The functions from CGNS mid-level library are listed and their uses are mentioned. Mesh adaptation is performed on single zone structure of flow through duct with an obstruction. Identification of the elements that needs to be replaced with the uniform mesh has been done based on a quality function. Bowyer-Watson algorithm was used to insert the new point in the existing mesh and to define the new connectivity of the elements.

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

Objectives of the project: Mesh adaptation.

Major learning outcomes: Learnt how the work has to be done in the team with cooperation of one another.

Details of papers / patents: Metric-orthogonal anisotropic mesh generation-Adrien Loseillea.

Brief description of working environment, expectations from the company: I had a freedom of expressing my interest of area. According to my interest, project had been given to me. I had great experience of working with my team members.

Academic courses relevant to the project: FEM, CAAD.

Name: PRUDHIVI RACHAN KUMAR SAI(2018H1410163P)

Student Write-up

Short summary of work done during PS-II: 1. Modify a script file which is used to calculate the fatigue life of aerostructures and added the effect of thermal gradient on the fatigue life of the components, automated the whole process of fatigue calculation.

2. Helped in the literature survey about the sensors used in the lubrication system.

Tool used (Development tools - H/w, S/w): Ansys APDL, Microsoft excel, AWK programming language, LINUX bash scripting.

Objectives of the project: As per Federal Aviation Administration (FAA), CFR – 14, section 33.14 maximum allowable number of start – stop stress cycles for the rotating structural parts should be identified. So, for finding low cycle fatigue, high cycle fatigue, accumulated damage.

Major learning outcomes: Learnt the basics of fatigue and about multi axial methodologies, life calculations and the basics of aircraft engines and mostly about its lubrication system.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is good and the mentors are supportive and clear the doubts, but it would be better if they chose the projects for interns before our arrival.

Academic courses relevant to the project: Fracture mechanics, Fatigue.

PS-II Station: JP Morgan Services-GKN Data Science-Fintech, Mumbai

Faculty

Name: Shekhar Rajagopalan

Student

Name: ADDEPALLI ADITYA(2015B1A70719H)

Student Write-up

Short summary of work done during PS-II: Built a tool to find patterns in big datasets using pyspark. We used a variety of techniques to optimize the implementation of FP growth in pyspark.

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

Objectives of the project: To built a tool that can find patterns in any dataset using a rule mining algorithm.

Major learning outcomes: Learnt about big data and optimization in pyspark.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Friendly, helpful environment.

Academic courses relevant to the project: Machine learning.

PS-II Station: JPMS - GR&C Commercial Banking Risk, Bangalore

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: LALIT MOHAN DHAMI(2018H1490360P)

Student Write-up

Short summary of work done during PS-II: This internship was a learning experience. The tasks assigned to me provided an insight in the world of equipment finance and helped to understand the importance of valuation to know the depreciating values of the assets at any given point of time. The equipment valuation grid is the first starting step in order to make leasing and lending decisions. The aircraft review project helped me to understand the nuances of aircraft financing. The annual review of leases for comparison with residual values helped me to know the present as well as the future status of returns associated with a particular lease. I was able to understand how to anticipate and monitor the risk associated with a lease. Creating access database for historical data was a test project in order to make us familiar with how access database functions and how we can sort our data and make our work easier. It helped me to learn MS access and practically use it to create a database.

Tool used (Development tools - H/w, S/w): MS EXCEL, MS ACCESS, MS WORD.

Objectives of the project: Project 1: To create an equipment valuation grid, compare it with an existing grid and report the deviation in the trend. Project 2: To collect and document data on the aircraft present in different leases and report the progress on a daily basis.

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: J.P. Morgan 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 the people 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 my mentors about our day to day activities. When lock-down due to COVID-19 was announced, JP Morgan was one of the few firms in India, who was ready with a formal plan to initiate work from home on a full scale. 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: Generally, the projects assigned deals with professional work of the firm and can't be directly associated with any course. But, the academic courses helped in creating a firm foundation in understanding various terminologies that I came across while doing.

PS-II Station: JPMS (Finance) GR&C Market Risk, Mumbai

Faculty

Name: Shekhar Rajagopalan

Brief write-up on each PS-II station : Financial Services Back End Support

Student

Name: GAURAV AGRAWAL(2016A1PS0486P)

Student Write-up

Short summary of work done during PS-II: We were mainly involved in helping the team automate their various tasks using Python and VBA. I worked on building an automated

system using Bloomberg which tracks market movements and informs the respective risk manager in case of breach of certain parameters. Another project was to write efficient codes to handle huge amounts of data coming from various sources to help in the classification of NMRF (Non-Modellable Risk Factors), which is required for IMA (Internal Model Approach).

Tool used (Development tools - H/w, S/w): Athena studio, Marrs, Risk central, etc.

Objectives of the project: To automate processes and learn about the various LOBs (Line of Business) of JP Morgan.

Major learning outcomes: 1) Proficiency in Python 2) MS Excel including VBA 3) Bloomberg.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The culture is very friendly. They expect you to get the work done within the deadline. So as long as you are able to get the work done, you won't face any issues.

Academic courses relevant to the project: DRM, FRAM, SAPM, OOP.

Name: SHUBHAM VARSHNEY(2016A2PS0620H)

Student Write-up

Short summary of work done during PS-II: My work at the organization can be divided in three parts.

The daily work assigned from the VaR team was to analyze the VaR numbers produced daily for the line of businesses. It was supposed to send out a report to the entire VaR team which details the direction, magnitude and reasons for the day on day change in VaR numbers.

The daily work assigned from the Equities team was to prepare a market flash summary which explains the current market movements in different global indices.

The Ad-hoc work assigned from VaR / credit / equities team was mainly focussed on automation of BAUs like the development of a dashboard which directly calculates the FSI stress numbers of different sensitivities.

Tool used (Development tools - H/w, S/w): Visual studio for Python, MS excel for importing / exporting of raw data and its analysis, VBA, SQL queries.

Objectives of the project: The main objective of all major / mini projects was to bring more assistance towards the firm's BAUs and improve the efficiency by free up some resources.

Major learning outcomes: I learnt various new methodologies through which the firm statistically captures the various risk exposures to the firm. These exposures come from various lines of businesses as well as various risk factors. I have improved my understanding on various finance concepts necessary for the BAUs. Apart from this, the projects had helped me to gain technical knowledge,

- o Advanced excel (Pivot Tables, Lookups)
- o Python (working with dataframes, internal libraries)
- o SQL (query design)

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is very good, specially team members are always helpful and we can approach them at any time. Also, this time the interns are being rotated in different teams for around 6-7 weeks each to gain the exposure of different teams within the market risk. I expect that the rotation policy should be adopted as it gives us the more exposure as well as the more chances to get an offer from other team if in case other teams are already fully filled.

Academic courses relevant to the project: Derivatives & risk management (DRM), Financial risk analytics & management (FRAM).

PS-II Station: JPMS (Finance) GR&C Model Risk Governance and Review - Challenger, Bangalore

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: KOTHAPALLI UDAYA RASHMI(2018H1490348P)

Student Write-up

Short summary of work done during PS-II: Responsible for analysis of qualitative models across firm and identifying any risk associated with them. Being a member of model risk governance and review team, I am responsible for the review and maintenance of estimation methodologies across the firm. Constructively challenge and improve existing forecasting methodologies used, have to think critically and communicate effectively with the business in order to mitigate the risk associated with the existing methodology.

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

Objectives of the project: To analyse the forecast models developed by business.

Major learning outcomes: How external economic factors impact banks income.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The team is so good and everyone there are highly knowledgeable, they helped me a lot in every work and tried to comfort me. It was a great working experience.

Academic courses relevant to the project: As I am not a finance student I find none.

PS-II Station: JPMS (Fintech) CIB R&A Banking (CRG), Mumbai

Faculty

Name: Shekhar Rajagopalan

Student

Name: CHAUDHARI PRATIK NARENDRA(2016A2PS0445H)

Student Write-up

Short summary of work done during PS-II: The Centralized Research Group (CRG) is the middle office of the investment banking division of JP Morgan. As a junior analyst, the tasks include working closely on various pitchbooks for marketing or live deal purposes. We work closely with bankers onshore and assist them with required financial analysis, marketing material or company research which in turn is used for various services provided by an investment bank - such as M&A, IPO, capital raising or financial advisory.

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

Objectives of the project: Generate M&A idea on deep diving into various gaming assets across Asia.

Major learning outcomes: Marketing, strategic rationale between various M&As, understanding how various industries work, business communication, financial analysis.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The work in an investment bank usually includes long hours and giving close attention to detail. Keen eye for industry and company operations and quick handling of various projects requiring various deliverables is important. Experience on working with MS office is a highly required.

Academic courses relevant to the project: FoFA, SAPM, BAV.

Name: Saumya Puglia(2016A2PS0508H)

Student Write-up

Short summary of work done during PS-II: Represented the buyer side and offer the deal to potential seller or represented the seller and pitch our profile to potential buyer to crack the deal. All these require thorough assessment of the industry, sector and companies involved in the deal, peer set of the said companies and all numbers pertaining to financial liquidity, capital structure of the companies. The sector is sensitive and dynamic in M&A business. So most of the projects, the team deals will have to do something or the other to merger and acquisition of various companies.

Tool used (Development tools - H/w, S/w): Most of the task-in-hand is managed using Microsoft excel and power point for execution. Data extraction is done using Bloomberg terminal, Factset, Merger market, Factiva, Thomson-one, Bam-Sec and many more company specific databases.

Objectives of the project: Centralized Research Group (CRG) – Regional investment banking.

Major Learning Outcomes: ☐ Ability to market, structure and execute corporate finance deals, including merger and acquisitions, divestitures, and spin-offs.

☐ Analyze the Market and financial position of client companies and competitors.

☐ Conduct due diligence on companies in connection with the valuations for merger and acquisition transactions and securities offerings.

Details of papers / patents: Idea generation in the industry as part of an internship project.

Brief description of working environment, expectations from the company: Given its vast outreach globally, every day there is something new to learn while interning here in J P Morgan. The experience here has totally changed the way I used to see finance. All the courses that we have completed under finance minor, the most prominent being financial management and business analysis and valuation have helped me a lot throughout this brief journey. Apart from

finance related knowledge, PS at J P Morgan has helped me polish my decisive skills, client handling skills and helped me bring out the best in me while in the stress of completing the task before the deadline.

Academic courses relevant to the project: Fundamentals of finance and accounting, Financial management and Business analysis and valuation.

PS-II Station: JPMS (Technology - IT) CIB R&A Data Science - Fintech, Mumbai

Faculty

Name: Shekhar Rajagopalan

Student

Name: MRIDUL BHASKAR(2016A7PS0391H)

Student Write-up

Short summary of work done during PS-II: I was assigned multiple projects during the course of my Internship. First one was based on rule mining and big data which involved using big data and association rules to find breaks in process / tasks. Another project was conversion of a code base from python to big data (pyspark). The final project that I was working on was preventing data breach using machine learning algorithms.

Tool used (Development tools - H/w, S/w): Python, Spark, Neo4j, IntelliJ, Jupyter.

Objectives of the project: First project was aimed at doing root cause analysis to capture exceptions. Second one was majorly optimization and completion of flow. Third one was aimed at preventing data breach.

Major learning outcomes: Use of data science in financial firms, distributed data and computing, client communication.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: The team in which I am working is great in terms of knowledge, communication and skill. Team members are easily approachable and fun loving. You are treated as part of the team during the course of internship. The team is focused on problem solving using data science. As far as JP Morgan is concerned, onboarding was pretty smooth.

Academic courses relevant to the project: Machine learning, Data mining, Information retrieval, Data structures & algorithms.

PS-II Station: JPMS (Technology - IT) GR&C Quantitative Research - Fintech, Mumbai

Faculty

Name: Shekhar Rajagopalan

Student

Name: PARTH SETHI(2015B3A70613P)

Student Write-up

Short summary of work done during PS-II: The macro indices team develops indices (portfolios) composed of many other sub-indices and derivatives contracts which are used to manage clients' money. I worked on 3 projects which are very related to each other. The objective is to help the structurers i.e people who develop the index algorithms, to analyze and improve the performance of their algorithms. Project 1 deals with inferring the composition of this index, which is then used in project 2 to generate analytics to visualize what the index algorithm is doing. Project 3 integrates the previous two models with existing index algorithm scripts. The projects involve econometrics, linear algebra and data science concepts like regression, multicollinearity, dimensionality reduction, principal component analysis and recursive factor elimination along with extensive programming knowledge in Python.

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

Objectives of the project: To help visualize and improve existing portfolio algorithms.

Major learning outcomes: Being part of the quantitative research division at JP Morgan has provided me an exposure to the world of quantitative finance and data science. From a technical standpoint, I learnt about Python development, data science, modelling and econometrics. From a business standpoint, I got to learn about how QR commodities works, what their products are, who their clients are, how indices are structured and analyzed, etc. Apart from the project, I have also learned the organization structure and how everything works in an investment bank, the different divisions and their roles and responsibilities.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: 9 hour workday from 12 - 9, regular / daily team meetings, status reports. Healthy workload with manageable timelines. Supportive managers and mentors. Given a lot of responsibility from the start.

Academic courses relevant to the project: Introductory econometrics, Machine learning, Math I, Math II, Probability & statistics.

Name: ADITYA GARG(2015B3A70618P)

Student Write-up

Short summary of work done during PS-II: Applied models like GARCH and EWMA to time series interest rate data. Also worked on market factor backtesting and exposure backtesting, among other BAU work.

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

Objectives of the project: The objective of the project was to remark volatilities of currencies which have been stale for more than 6 months with historical volatilities.

Major learning outcomes: Proficiency working in Excel and Python. Also, practical application concepts taught in derivatives and risk management, financial engineering, probability and statistics as well as applied econometrics. Got to work and interact with JP Morgan traders and senior Quants.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment is definitely stricter than what you would see in IT companies. You will regularly interact with senior people sitting in Singapore, London, New York, etc, depending on your team. The project work is okay, but the BAU work is quite repetitive and monotonous. I would only recommend it to someone who specifically wishes to pursue a career in the Quant field.

Academic courses relevant to the project: Derivatives and risk management, Financial engineering, Object oriented programming, Probability and statistics, Applied econometrics.

PS-II Station: JPMS (Technology - IT) GR&C Wholesale Credit Solutions - Data Science - Fintech, Mumbai

Faculty

Name: Shekhar Rajagopalan

Student

Name: AAKANKSH V ZARAPKAR(2016A7PS0096G)

Student Write-up

Short summary of work done during PS-II: I was part of a team that constructed a complete multi-stage NLP pipeline. Initially, this involved scraping data from a variety of sources and

performing text extraction and cleanup on documents with a wide variation of formats. We then applied various NLP techniques followed by a custom business knowledge layer to categorize risks to our entire client base, finally presenting our insights in a singular, compelling dashboard. Following this, I also developed a framework to alert risk officers of metric degradation in clients from the asset based lending space. My team also developed incredibly powerful statistical models for forecasting using FB Prophet.

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

Hadoop, Spark and Pandas for working with the data.

Sklearn for building machine learning models.

Tableau and Excel for interpreting and visualizing results.

Objectives of the project: Deliver consolidated data and intelligence in a unified dashboard for our entire clientbase.

Major learning outcomes: Extracting actionable data from a heterogeneous document space. Building unsupervised learning algorithms on 20k entities and using feedback on 1k entities to tune the model as well as devise a business knowledge layer to help it generalize better. Dealing with highly ambiguous situations and defining compelling objectives to solve for the right problems and push the needle further.

Details of papers / patents: No papers or patents resulted from this project.

Brief description of working environment, expectations from the company: Good working environment. Company expected us to take ownership of our projects and work on tasks as a team. Strict adherence to working within business hours and having no overflow to the weekend. 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. This was a very rewarding ecosystem to work in.

Academic courses relevant to the project: Data structures and algorithms, Data mining, Machine learning, Neural networks and fuzzy logic.

PS-II Station: JPMS (Technology-IT) GR&C Model Risk Governance and Review - Ongoing Performance Management, Mumbai

Faculty

Name: Shekhar Rajagopalan

Student

Name: RAHUL KHANDELWAL(2016A7PS0128P)

Student Write-up

Short summary of work done during PS-II: During the initial week, I worked on the multiple training programs which were assigned to me. These programs helped me gain insight into the working of the company. My current work requires me to maintain, enhance and improve existing applications that are currently in use in the organization. This work requires me to learn new technologies such as Python and JavaScript which is predominantly what I have worked on in this time period. Also, My work was to understand the integration of new technologies such as React and TypeScript in the JP Morgan internal framework.

Tool used (Development tools - H/w, S/w): React, TypeScript, Python, Javascript, HTML, CSS, Athena studio.

Objectives of the project: Scope of my project requires me to maintain, enhance and improve existing applications that are currently in use in the organization. This work requires me to learn new technologies such as Python and JavaScript which is predominantly what I have worked on in this time period.

Major learning outcomes: This PS-course has been a great learning experience for me. My takeaway from this course includes how big corporate organizations function, getting hands-on experience on the latest tech stack available in the industry, how to work with a large codebase involving hundreds of files and writing maintainable, readable and reusable code were the important learnings. I have also been able to improve my problem-solving skills by applying

theoretical concepts in real life. This course provided me an opportunity to understand the importance of soft-skills like how to handle responsibility, time management and communication skills and helped me hone these skills. This also helped me understand how integral teamwork is to a project.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment was just great. There was a flat structure in the team and you could ask anyone for help from the team and they would be willing to help you. There were monthly team outings as well to improve the bonding between the team and overall the importance of team work was clearly visible in the organization.

Academic courses relevant to the project: Courses like principles of programming languages, data structures and algorithms, object-oriented programming and database systems proved to be of utmost importance during the internship.

PS-II Station: JPMS-GR&C Credit Risk-Counterparty Credit Infrastructure & Capital, Mumbai

Faculty

Name: Shekhar Rajagopalan

Student

Name: KUMAR ARCHIT(2016ABPS0647H)

Student Write-up

Short summary of work done during PS-II: Two categories of work was there. One was a BAU (Business as usual) and the other was a project type work allotted to me. In the BAU part, I had to do the daily exposure analysis for the counter-parties trading with JPMS AG and PLC.

The other part was the project part which consisted of analysis of EE profile and making a case study for replacing current metric for capital calculation and some tactical automation around BAU. It was based on Python, Excel and JavaScript.

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

Objectives of the project: Analysis of expected exposure and rising EE profile.

Major learning outcomes: Extensive understanding of counterparty credit risk metrics for OTC derivatives and SFT products.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is very friendly. Everyone is always willing to help you with any doubts about the work.

Academic courses relevant to the project: FRAM.

PS-II Station: Jubilant FoodWorks Pvt. Ltd., Noida

Faculty

Name: Gaurav Nagpal

Student

Name: TANMAY SINGH(2018H1490378P)

Student Write-up

Short summary of work done during PS-II: I worked as a marketing trainee with Domino's & Dunkin Donuts India for a span for 6 months, following points summarize my journey;

1. Independently drove idealization and closure of 7 projects for Dunkin and 2 projects for Domino's.
2. Worked on brand growth strategy and prepare management level reports on brand's performance, needs and forecasts.
3. Lead the digital marketing vertical - Social media marketing, Performance marketing & Content marketing. Attaining first time ever CTR of 3.1 % and CPC of Rs 0.7.
4. Framed marketing mix for consumer-brand interaction and executed IMC programs (traditional and digital), CRM & PR strategy.
5. Acted as a single point of contact with sales, R&D, creative agency, media agency, supply chain, trade marketing team, legal etc.
6. Analyzed aggregator funnel data to re-design menu flow & pricing structure on Swiggy & Zomato amid COVID-19.
7. Identified a completely new target audience (KIDS) for Dunkin and carried out the launch of Dunkin's DIY Donut magic box amid COVID-19 to boost delivery revenue.
8. Designed loyalty & referral programs and framed Subscription plans for combos.
9. Conducted retail audit analysis to design an up-selling training campaign for employees, aiming 5% increase in revenue.
10. Developed & implemented packaging revamp project for supply chain cost reduction & sustainable packaging introduction.
11. Worked directly with DUNKIN', USA to conceptualize & develop the beverage forward strategy 2020, for reshaping Dunkin Donuts brand image in the coffee market, India.

Tool used (Development tools - H/w, S/w): Power BI, Google analytics, Microsoft excel, Microsoft powerpoint, Facebook business manager.

Objectives of the project: The main objectives were to: increase brand awareness and drive sales using innovative marketing implications.

Major learning outcomes: - Saw the importance of product first visual appeal in customer acquisition.

- Realized the potential of correct customer data in order to promote a product.
- Acknowledged the role of aggregators in making a product success or failure.
- Analyzed the real-time paid & organic campaign performance for over 7+ media plans.
- Got practical experience of research and development for a product to get approved.

- Learnt to make business proposals and forecast cases.
- Got better understanding on coordination between all division like HR, supply chain, operations, finance, IT and marketing.

Details of papers / patents: Research paper entitled “The emerging trends in the QSR Industry: Perspectives drawn from India”.

Brief description of working environment, expectations from the company: My working team was very friendly and helping throughout my internship, they always made me feel like a regular full-time employee and allowed me to share my views openly and execute them with full authorization. You can expect to learn most in this company and can touch any vertical you hold interest in.

Academic courses relevant to the project: Yes

PS-II Station: KPMG, Bangalore

Faculty

Name: Sandeep Kayastha

Student

Name: SHUBHENDRA KUMAR PANDEY(2018H1490338P)

Student Write-up

Short summary of work done during PS-II: Deep insights about the corporate structuring, reporting and operating principles, while executing assignments.

Tool used (Development tools - H/w, S/w): Office suite, Tableau, R, Paid databases.

Objectives of the project: The deliverable was to cater to the requests of the clients from KPMG member firms and the behavioral objective was to comply with the rules and regulations

of the firm. I was concerned with researching, developing and understanding of the management fram.

Major learning outcomes: I gained deep insights about the corporate structuring, reporting and operating principles, while executing assignments and working with enthusiastic colleagues.

Details of papers / patents: Null.

Brief description of working environment, expectations from the company: The working environment was very open and conducive to learning. My colleagues have been supportive of me across the course of the internship and aided me in various projects, providing their valuable time guiding and training me in several arenas critical to the deliverables.

Academic courses relevant to the project: Yes.

Name: SREE RANJANI R(2018H1490351P)

Student Write-up

Short summary of work done during PS-II: I got a chance to do my PS-II in KPMG Global services. Starting my career with a Big 4 company right after college was a golden opportunity for me. I worked with the research and benchmarking team, as a part of their capability hubs. My role involved performing primary and secondary research to cater various requests from clients. For example, we once had a request where the client wanted to invest in the construction industry of African region, and hence wanted to know the current scenario and futuristic opportunities for the same. For this, I worked on 7 different African locations and derived appropriate insights about various parameters like market value, FDI, incentives, government plans etc, and successfully delivered it to the client. Additionally, some of the major products of KGS, I worked on were location assessment, industry analysis and benchmarking. I dealt with clients from numerous geographies, some of them being Australia, Saudi Arabia,US, China and also had the chance to interact with them directly. Working with KPMG has empowered the MBA student in me and has provided me with me new outlooks and

constructive learning. With a PPO in hand, I look forward to work with the firm and thank BITS for the same!

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

Objectives of the project: To perform primary / secondary research to cater to the requests of clients from different geographies.

Major Learning Outcomes: Domain knowledge on Industry analysis, Location assessment and Benchmarking. Other learning outcomes includes, understanding an annual report, communication with international clients, power point and excel skills, secondary research and understanding KPIs.

Details of papers / patents: Writing a thought leadership on investment opportunities in Lithuania.

Brief description of working environment, expectations from the company: KPMG has a splendid work environment. The culture of the firm is great, and everyone is respected equally. The entire team sits together in the same desk, irrespective of juniors or seniors and works unitedly. I was seated next to my boss's for 2 months and never really felt the difference because everyone there are understanding and supportive. Even, when I faced difficulties with understanding the working of the organisation in the initial days, my team stood by me and made sure I understood everything. You can also go and play a game of football in the middle of work, if you feel stressed! The company is employee friendly and offers a good work-life balance.

Academic courses relevant to the project: Management framework and functions, Marketing research, Managerial skills, International business.

Name: SHARMA SNEHA RAJESH SHARMILA(2018H1490379P)

Student Write-up

Short summary of work done during PS-II: The work evolved around understanding on various areas of Tax via thorough research and analysis, to put forward a complex scenario in a simple form. The simple structure is what makes it very attractive for any client, who are looking forward to have an exploration in the area of Tax. It involved bench-marking projects to compare with the competitors in the industry and provide suggestion or implications based on it.

Tool used (Development tools - H/w, S/w): Capital IQ, BoardEx, Power-point and Excel.

Objectives of the project: The objective of the projects is proper analysis and bench-marking with their competitors and providing suggestions or implications based on it.

Major learning outcomes: Understanding of annual reports, About how different jurisdictions go about tax, Financial ratios and bench-marking projects over various tax aspects.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The work environment at KPMG is very motivating and inspiring. The team is very helpful and provides insights over various domains. The culture at KPMG emphasizes on personal development and team building process and provides various learning platforms to enhance knowledge and skill-sets.

Academic courses relevant to the project: Financial and management accounting (FMA), Strategic management, Corporate finance and taxation (CFT), Management framework and functions (MFF).

Name: VANGAPATI SANDEEP REDDY(2018H1490406P)

Student Write-up

Short summary of work done during PS-II: I was a part of UK research and benchmarking team. The work majorly comprised of extensive market research and profiling for the business development of clients.

Tool used (Development tools - H/w, S/w): Excel, PowerPoint and Internal databases.

Objectives of the project: Worked on multiple projects. Most of them were profiling and secondary research.

Major learning outcomes: Gained immense domain knowledge across various sectors. Exposed to client interactions, alignment of thought process with the client mindset. Efficiency in Excel, communication, culture, analyzing annual reports, PowerPoint, frameworks.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: KGS, Bangalore office is situated in Global tech park, Marathahalli, giving one a ringside view of the corporate world. The organization has well defined targets for the trainees to achieve and people are approachable. The organization expects you to come up to speed quickly and deliver on live projects from the very beginning. Most of the work-related learning is on the go. This provided one with the experience of being in a startup environment within a big four organization. My mentors were extremely understanding all throughout the course of PS-II and undertook personal efforts to help me adjust to the rigorous nature of the work. My experience at KPMG has been very enriching and it was very rewarding to see my efforts being appreciated by my team. I am thankful to my mentors.

Academic courses relevant to the project: Yes.

PS-II Station: La Renon Healthcare Pvt. Ltd., Ahmedabad

Faculty

Name: Bharathi R

Student

Name: MAHIMA DHARMENDRAKUMAR KSHATRIYA(2018H1460318P)

Student Write-up

Short summary of work done during PS-II: India being a developing nation has its challenges focusing on its healthcare sector where one of the major causes of mortality is kidney disease. With, the high expense associated with the treatment of Chronic Kidney Disease (CKD) and end-stage renal disease where medication load, increased session of dialysis, and renal replacement therapy becomes the only option for survival which is not feasible to the majority of its population. Thus, the report is a detailed study about the progression of CKD whose one of the leading causes is Uremic syndrome. The detailed insights of Uremic syndrome which is due to the retention of the uremic solutes is been cited in the report. The report describes the major causes of uremic toxins in its classification and adverse events. A new approach / product to manage the disease and to delay its progression by eliminating the protein-bound uremic solutes is to be launched by the organization namely “Fidotox” in its nephron division. The product contains inulin and betain oral powder meant for managing the elimination of uremic toxins in CKD patients. The detailed mechanism of action of the oral powder its complete study is being presented. Furthermore, the most essential part of the market potential of the same product is being calculated which gives a positive outlook before the launch of the product to be a success in the Indian market in the future course.

Tool used (Development tools - H/w, S/w): None.

Objectives of the project: To study how uremic toxin aids in progressing the CKD & to determine the market potential of product FIDOTOX used in elimination of uremic toxins.

Major learning outcomes: Marketing of a product, How to launch a product in the market, How to estimate the market potential of product.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The company has very good work-culture. The superiors as well as the colleagues are kind and supportive. The management runs smoothly. The management expects the employers to be hardworking, enthusiastic and sincere regarding the work and the company.

Academic courses relevant to the project: Molecular pharmacology, Pharmaceutical administration and management.

PS-II Station: Lowe Services India Pvt. Ltd., Bangalore

Faculty

Name: Sidharth Mishra

Student

Name: KONARK JOSHI(2016A4PS0176H)

Student Write-up

Short summary of work done during PS-II: I was part of promotions team of data analytics and computational intelligence (DACI). Worked as an individual contributor in data mining and exploratory data analysis. Actively contributed in the 'Promo Forecasting' product that the team is currently working on.

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

Objectives of the project: The aim of the product was to assist promo planners in making an informed decision while planning for future promotional events; the end user can compare sales, margin, lifts for different discounts during a particular time-period on different items sold.

Major learning outcomes: Understanding of retail business, data analysis tools and concepts; improved business communication and presentation skills.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The managers and team member are cordial. They'll help you out with relevant knowledge transfer. There's no pressure to meet the deadline as long as you are giving your 100%. Initial SQL / excel training sessions are organised for the interns. Personal laptops are issued. Great learning and overall good experience with the company.

Academic courses relevant to the project: None being from A4. Training provided and self-learning attitude should be helpful.

Name: YASHRAJ SINGH(2016A4PS0266G)

Student Write-up

Short summary of work done during PS-II: I worked in macro economics team, one of the vertical of customer insights team. My tasks involved web scraping, refreshing various macro economic dashboards, automating data preparation processes and creation of a new macro economic dashboard. Apart from this, I also worked with the market share and insights team (the other two verticals of CI team), in which I did web scraping, helped in preparing various presentations and text coding of survey comments. I also prepared a data repository which includes overview reports of tools used here in DACI.

Tool used (Development tools - H/w, S/w): Databases - Hadoop, Teradata
Programming Languages - Python, SQL
Dashboard Tool – MicroStrategy / DART

Objectives of the project: Using python automate data collection process from websites, refreshing various macro economic dashboards, automating data preparation process for

forecasting, creating a new macro economic dashboard in microStrategy, classifying survey comments, preparing final reports.

Major learning outcomes: Technical-Random forest forecasting, Time series forecasting, MicroStrategy, Python (Selenium, Pandas), SQL.

Non-Technical- I got to learn how the macro economics, market share and insights segment of customer insights team provide critical insights to help improve the business.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: For me, I found the environment was very friendly and the working culture is also great. Almost everyone in DACI is easily approachable. Seniors are also very helpful. The timings are flexible too. Overall, I found Lowe's a great place to work.

Academic courses relevant to the project: None.

PS-II Station: Lucas TVS Pvt. Ltd., Chennai

Faculty

Name: Glynn John

Student

Name: CHINMAYA BHURE(2018H1410164P)

Student Write-up

Short summary of work done during PS-II: I have designed 3 concepts of bicycle frame which is going to be used in the electric bicycle, a product the company is planning to launch soon. I have also made a detailed quality function deployment and applied the concepts of product design and finite element method in order to reach a feasible design.

Tool used (Development tools - H/w, S/w): Creo Parametric 2.0, Solidworks 2016, ANSYS 17, Autodesk Fusion, Maple, MS Excel.

Objectives of the project: To design a frame for a rear hub motor fitted electric bicycle.

Major learning outcomes: I learned the intricacies of the modelling softwares Creo and solidworks and how to utilise the capabilities of the softwares to quickly model anything. I learned the difficulties that arise while doing the simulation on a object realistically and how to tackle them. I learned that if you are stuck in a problem then start something else too and you will eventually end up on the solution for the problem you left concentrating on.

Details of papers / patents: I have given 4 designs of the cycle frame. I have done the static structural analysis on frame-1 and aim to do the dynamic analysis on the frames.

Brief description of working environment, expectations from the company: Working environment in the company was very time bound and intense. Everybody is busy all the time. There is no time for groupings.

Academic courses relevant to the project: Product design, Finite element method, Engineering mechanics, Computer aided design and analysis.

PS-II Station: MathWorks India Private Limited, Bangalore

Faculty

Name: Pradheep Kumar K

Brief write-up on each PS-II station : Required more knowledge on artificial intelligence, Quantum computing, Augmented and virtual reality, Blockchain.

Student

Name: HRITIKA SUNEJA(2016A7PS0093G)

Student Write-up

Short summary of work done during PS-II: Created a tool for simulink check which saves the changes made to the input parameters in the check object and gives the user an option to run the check with modified configuration and displays the check result there as well.

Tool used (Development tools - H/w, S/w) : MATLAB App designer.

Objectives of the project: Currently when a change is made in the input parameters of a check, the configuration needs to be saved as a json file and the configuration needs to be loaded by going back in the model advisor. So, the aim of the project is to develop a tool so that all can be used.

Major learning outcomes: MATLAB App designer, Simulink check.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The company has a good working environment with a great work life balance. There is a collaborative work culture where you can approach anyone anytime for any help needed.

Academic courses relevant to the project: Yes. OOP laid the fundamentals for the project coding.

Name: Kajal Bansala(2018H1400115G)

Student Write-up

Short summary of work done during PS-II: PS2 in MathWorks provided a varied experience. As an intern in MathWorks, I got an opportunity to learn about the various products provided by MathWorks through SIT Plan and instructor led trainings. Post trainings, I got an opportunity to contribute to the following teams,

1. Project: This involved researching about the flows in the existing block graphics testing tool and developing a new testing tool for testing the DVG block graphics features.
2. Technical Support: This involved solving the customer queries. The queries were based around all the MathWorks products used by customers. The level of queries was quite advanced since the customers usually performed an extensive research before posting their queries. This helped in understanding the customer's perspective of using the products and along with this, it helped me implement the knowledge gained during trainings.
3. Knowledge Centered Support (KCS) Team: As a member of this team, I organized knowledge sharing meetings every week.
4. Bashing Team: MathWorks hosts a company wide bashing before every MATLAB release. During bashing, all the employees use the products and try to find bugs before the final ship of the release. My role included preparing the confluence page and dashboard for the EDG team bashing and encouraging more and more employees to bash through various creative ways.
5. Interview Team: Being a member of this team, I got an opportunity to understand interviews from an employer's perspective by shadowing a few interviews. I also improved the tool used for automating the interview process.

Tool used (Development tools - H/w, S/w): Sandbox, Perforce, BaT, MATLAB, Simulink, Simscape.

Objectives of the project: Contribute to the engineering development group.

Major learning outcomes: It helped me to improve my technical and soft skills.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment in the company is amazing with super supportive peers. MathWorks provides required training for the all the work it expects you to do.

Academic courses relevant to the project: Yes.

Name: Tamhankar Sukrut Bhaskar(2018H1400134G)

Student Write-up

Short summary of work done during PS-II: My project was creating automated tests for TI C2000 SPKG processors. The project involved writing a shared test class for verifying code replacement library (CRL) functionality in the generated code. So, in this project, code replacement functions are checked and displayed corresponding to specific Simulink blocks / operations. Also, comparison table of execution times with CRL enabled and with CRL disabled settings is shown and timing optimization is checked. Summary of results obtained in Simulink data inspector is captured and no. of within tolerance results, out of tolerance results were displayed. The concept of Processor-in-Loop (PIL) simulation and real time code execution profiling is used in this project. Another class inherited from shared test class is written in which user can specify properties like target hardware board (in our case, TI C2000 Processors), required code replacement library, simulink settings, hardware settings, profiling options, expected CRL functions to be replaced etc. according to requirement. Also as a part of Engineering Development Group (EDG), I handled customer cases related to technical issues while using various MathWorks products and provided them solutions through emails as well as wrote MATLAB answers on the forum.

Tool used (Development tools - H/w, S/w): MATLAB, Simulink, Embedded coder support package for TI C2000 processors, TI F2807x piccolo board.

Objectives of the project: 1. Check code replacement in the generated code 2. Check for timing improvements with and without CRL 3. Check accuracy of output.

Major learning outcomes: Understanding of code generation using embedded coder, Concept of PIL simulation, Code replacement library, Real time code execution profiling.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work environment was very good. Colleagues, mentors and managers were supportive. It helped me improving my technical skills as well as improving professional skills.

Academic courses relevant to the project: Embedded system design, Real time systems.



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

Faculty

Name: Y V K Ravi Kumar

Student

Name: PATIL ADITYA JAYSINGRAO(2018H1030116H)

Student Write-up

Short summary of work done during PS-II: I worked on creating deep learning model for 3D data. Specifically, the aim of the project was to create a model to generate 3D car assets, using various machine learning / deep learning approaches. The two approaches that I tried were VAEs and GANs. I also created some supporting software tools, such as those to read / write 3D data, to create simplified meshes, etc. Apart from this, I had 2 weeks training on mathworks tools / processes, and 2 weeks were spent on resolving customer support cases. Significant amount of my time was spent on reading research papers in this domain.

Tool used (Development tools - H/w, S/w): Pytorch, Python, MATLAB, C++, Blender, MeshLab.

Objectives of the project: To create a deep learning model to generate 3D car assets.

Major learning outcomes: Deep Learning, Pytorch, 3D Geometry, 3D modelling.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The work culture is laid back, and while deadlines are strictly followed, they are not stressful. However, this might vary based on specific team(s) you work with, and whether it's internal project or not. There will be multiple managers to report to, and multiple tasks to be completed in parallel (training, support, project) and company expects you to manage your time appropriately.

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

Name: MALLELA CHAITANYA SAI(2018H1240089H)

Student Write-up

Short summary of work done during PS-II: To ramp up continuous wavelet transform and its implementation and to analyze the working of Convolution Neural Network (CNN).

To develop MATLAB code that takes ECG data as input, convert it into image and train CNN with CWT data and validate the trained CNN.

Introduction to MATLAB code generation feature to convert MATLAB code to C/C++ code and validate the generated code using x86 compiler.

Calculate the error tolerance between MATLAB output and x86 compiler.

Use MATLAB Hardware Support Packages (HSP) to interact with Raspberry pi and perform ARM compatible code generation to deploy in Raspberry Pi device.

Validate the Codegen code on Raspberry pi and calculate the error tolerance between MATLAB output and Raspberry Pi output.

Introduce ARM intrinsics without changing the functionality to speed up the execution by a factor 3x.

Tool used (Development tools - H/w, S/w): MATLAB, MATLAB code generation app, Microsoft visual studio for C++, Raspberry Pi Linux g++ compiler, ARM Neon 10 Intrinsic suite.

Objectives of the project: The project focus on the classification of ECG data from the persons who are suffering from various heart ailments. The ECG data recordings are taken from

PhysioNet data source. These recordings are converted to scalograms by applying continuous wavelet.

Major learning outcomes: Wavelets analysis in MathWorks wavelet toolbox, Training a Neural Network and validation, DSP optimization techniques.

Details of papers / patents: Since, the project involves research as well as optimization and new in its implementation this project gonna be published as an example in the Mathworks documentation in the Wavelet toolbox deep learning resources.

Brief description of working environment, expectations from the company: Work culture is collaborative and no night shifts.

Project deadlines will be sharp and timely progress is monitored. Retrospection meetings after every project completion and performance is evaluated.

The company expects a candidate with good domain knowledge and efficient programming skills and flexible to choose different project areas.

Mentors and managers will guide towards having a productive work experience.

Academic courses relevant to the project: Advanced digital signal processing, Introduction to Artificial Neural Networks.

PS-II Station: Mercedes Benz, Bangalore

Faculty

Name: Shashank Mohan Tiwari

Student

Name: ADITYA JAMAN VAGHASIA(2016A4PS0352P)

Student Write-up

Short Summary of work done during PS-II: Worked on two different projects in same department.

Project 01: Task automation for pre and post processing work. Development of rapid result generating tool for comparative analysis and troubleshooting. Achieved process efficiency and significant time saving without compromising accuracy of results.

Project 02: Applied machine learning concepts to develop and implement data driven prediction tool. Project involved exploratory background to check the feasibility and reliability of the generated results.

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

Objectives of the project: Task automation and Data driven prediction.

Major learning outcomes: Machine learning, Audio fast fourier transform.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Good Place to learn, explore and experiment. Flexible working hours. Knowledgeable, friendly and approachable guides and mentors throughout the course of the project. Got significant time to learn on the required tools and languages which were required for the applicable project.

Academic courses relevant to the project: Vibrations, Programming.

Name: SAGAR SINGHAL(2016A4PS0361P)

Student Write-up

Short summary of work done during PS-II: Performed a dynamic analysis of the bending of human bone in the form of a 3 point bending test. This forms a portion of a much bigger project which extends to the entire human model. Interns were first accommodated into the office environment and equipped with the knowledge of necessary software through on-hand training

and practice problems. The training was then extended to the project in question and solved problems were addressed. The actual project work was led by intensive literature research and exchange of knowledge to bring the students to speed in parallel with weekly team discussions to keep all teams up-to-date about work performed by other teams. The pandemic situation was addressed by implementing work-from-home setups. Work proceeded with active feedback and suggestions from mentors as well as a shared drive of continuous enhancement. Once the primary objective of the study was achieved, it was extended to further enhance the model where active suggestions from the students were welcomed as well. This concluded the project along with an enlightening and constructive experience at MBRDI.

Tool used (Development tools - H/w, S/w): The simulation setup was prepared in ANSA and then run using LS-Dyna. The results were viewed using animator.

Objectives of the project: The purpose of the project was to study the validity of virtual human models in order to most closely mimic human response in the event of an accident. The model must be appropriate to be used for pedestrian as well as passenger.

Major learning outcomes: The model was validated and its response under different environmental conditions was studied. Inferences were drawn to explain any differences.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The company environment is active following a pattern of work hard - play hard. The work done is highly technical and specific therefore, it is a haven for all who enjoy this field. Work outside office hours is discouraged to ensure people enjoy their leisure time. Basic ergonomic comforts are provided and active feedback is taken to ensure the best operation. It is equipped with the best resources industry has to offer and actively counters market problems with innovation solutions. Since, the company provides the best, it expects the best. The best effort is expected from all employees with proper formats and standards. And it is with this cumulated effort that the company stands out above all.

Academic courses relevant to the project: Mechanical engineering core courses were most appropriate. However, some modernization which includes digitization, programming and proper documentation practices are required.

Name: KARTHICK CHETTI(2018H1060163H)

Student Write-up

Short summary of work done during PS-II: The two projects I undertook were proof of concept studies to make Mercedes Benz future ready. The first project included in developing an application to reduce the human intervention in post-processing tasks for full vehicle crash simulations. The applications had separate modules for post processing tasks such as identification of buckling of cross members, identifying battery damage in electric vehicles, identifying structural integrity issues like cracks and separations in body in white parts and predicting the crash absorber utilization in side pole load cases. The second project was based on assessing the environmental impacts of components of the vehicle and to reduce CO₂ emissions as a part of carbon neutral mobility initiative. The whole manufacturing process is modeled in GABI (LCA) software and the environmental hotspot processes were highlighted. The inclusion of LCA in the product development is a new initiative at the Indian research center.

Tool used (Development tools - H/w, S/w): Python, Linux, Ansa (Pre-processing), Animator (Post-processing), LS Dyna (Solver), GABI (Life-cycle Analysis).

Objectives of the project: 1. To use computer vision algorithms to classify and detect issues in full vehicle crash simulations & 2. To determine environmental footprints over the life cycle of a car and decide on possible avenues for reduction of CO₂ emissions.

Major learning outcomes: The first thing I learnt was to work as a team. You need to coordinate with other team mates in order to finish your project. I learnt to make professional presentations which is not quite as same as the presentations we used to give in college. I learnt to work with German counterpart and learnt various organization practices such as

knowledge sharing sessions and best practice meetings. I learnt to work from home and handle online meetings during the pandemic. On the technical side, I learnt programming in these six months, building user interactive applications, deep learning and computer vision. I learnt to handle external software vendors and was successful in pitching a proof of concept to the company for the purchase of a software.

Details of papers / patents: Internal paper at daimler.

Brief description of working environment, expectations from the company: I have to say that Mercedes Benz Research & Development, India (MBRDI) is one of the best places to work if you are a mechanical engineer and interested in research. They treat interns as employees and you can avail all the facilities that an employee avails. At MBRDI, excellence is what they care for, and you can showcase your work to high levels of management without any restriction. The managers are quite supportive and you get a buddy assigned to you who guides you throughout your internship. You get free food and a good stipend to sustain in Bangalore. Flexible working hours are useful if you want to work at your pace. The amount of expertise every person has here can shape your career, it is a competitive environment and you have to be at your best to complete the challenging projects.

Academic courses relevant to the project: Finite element methods, Product design, Computer aided design.

Name: HARSHAL VINAYAK DHAKE(2018H1060172H)

Student Write-up

Short summary of work done during PS-II: The project was related to child occupant safety analysis. Basic training in meshing and LS-Dyna was given. Full scale child occupant simulation was run and injury values were measured from it for a particular crash load case. These values were then compared with different load cases simulation. Later, the occupant safety system was designed to reduce the injury values of the occupants.

Tool used (Development tools - H/w, S/w): ANSA, Primer, LS-DYNA, Animator, Hypergraph.

Objectives of the project: To calculate injury values of child occupant in small overlap crash load case, compare these injury values with other crash load cases and design safety system to reduce the injury values.

Major learning outcomes: Full scale occupant safety simulation was run. Got insights about the occupant safety system and carry out dynamic simulations.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The manager and the team mates were helpful. They had helped and solved every doubt during the course of internship. The team members also gave training related to the softwares used.

Academic courses relevant to the project: Finite element method.

Name: PATIL BHUSHAN DEVENDRA(2018H1060206P)

Student Write-up

Short summary of work done during PS-II: Meshing of components, modeling so that simulation results match with the hardware tests, method development to predict forces.

Tool used (Development tools - H/w, S/w): ANSA, LS - Dyna, Animator.

Objectives of the project: Modeling of ball joint used in automobile to accurately predict forces in dynamic scenarios.

Major learning outcomes: Issues faced during implementing theoretical knowledge into practice and how to address them.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: People are very friendly, anyone is ready to help if approached.

Expectation - Need to express what you have learnt and what you are doing clearly and confidently.

Academic courses relevant to the project: SOM, FEM.

Name: Dipam Jayantkumar Shah(2018H1410081G)

Student Write-up

Short summary of work done during PS-II: Project title was CAE using artificial intelligence and machine learning. Traditional CAE tools are time consuming and also not economic from organization end, so how recent technology of AI & ML will be adopted and implemented to CAE industry to get reduce the simulation time from 1 month to few minutes. ML & AI also does not require any pre-processing like meshing and all major area of project was focused grommet and wiring harness.

Tool used (Development tools - H/w, S/w): Majorly closely working on Python coding along with this Hyper-mesh, Abaqus, Meta-post, NX flexpipe are used for data preparation for ML & AI and for automation of CAE steps.

Objectives of the project: Reduce the simulation time, cost along with that for wiring harness analysis, physical testing was done by third party but due to COVID-19 for some cable testing was not possible. So with the help of ML material property prediction was performed which reduces huge testing methods.

Major learning outcomes: How machine learning and artificial intelligence was useful for any CAE industry and specially for R&D center. How to make difficult situation in to good opportunity. Coding is now integrated part of design engineering.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: MBRDI is one of the good place to work dream for every design and mechanical engineer. Here your manager, mentor, teammates all are very supportive and helping in nature. Atmosphere was too friendly not like conventional organization. Your idea, suggestion and work etc. will be appreciated very well.

Academic courses relevant to the project: FEA, Strength of material, Fracture mechanics, CAAD.

Name: Vivek Nanjappa(2018H1410109G)

Student Write-up

Short summary of work done during PS-II: 1) Worked on validation of laminated glass material models through literature study and analysis in order to understand the failure behaviour during impact (out-of-plane loading like head impact or in-plane loading like rollover of vehicle).

2) CAE process automation to increase the efficiency of product development by reducing the rollover load-case setup time.

Tool used (Development tools - H/w, S/w): ANSA, LSDyna, Primer, Python scripting.

Objectives of the project: Development of material model of windshield to achieve good correlation with test data and to reduce overall product development time through CAE automation.

Major learning outcomes: Process automation, Crash analysis load cases, Pre-processing software (ANSA).

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Great company to work for, most of the teams are technically very competent. The management's approach towards the employees is remarkable. Company expects the students to be proficient in atleast one scripting language and interest towards programming.

Academic courses relevant to the project: Strength of materials, Finite element analysis, CAAD.

Name: SUMAN MONDAL(2018H1410132H)

Student Write-up

Short summary of work done during PS-II: For a vehicle development, generally we rely both on simulation and hardware test results. But at times, these results do not exactly match each other. A delta gap always exists between these two. My project is all about to find out the parameters which are responsible for the gap in results and propose a methodology for better representation of the FE model which can correlate closely with the test model.

Tool used (Development tools - H/w, S/w): Ansa, Nastran, Hypergraph, Animator.

Objectives of the project: Study to find out the sensible parameters responsible for the delta gap. Propose a methodology for better representation of FE model.

Major learning outcomes: A hands on experience on tools like Ansa, Nastran and others which are extensively used in industries for CAE applications.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The work culture definitely suited me very much. People from diverse backgrounds are working together in every team. As an intern I got a basic training on the tools required for my project and my team mates helped me out with every doubts and difficulties during the course of project.

Academic courses relevant to the project: Finite element method, Dynamics & vibrations.

Name: PRATHAMESH CHANDRAKANT TAKALKAR(2018H1410138H)

Student Write-up

Short summary of work done during PS-II: During the internship, I had worked on development of various automation and data visualization tools using Python and VBA. The first tool I had built was to aid the automatic generation of the PERMAS solver deck. The second tool was developed to help in visualization of the Nomload with respect to the load collective. The third tool was used to check and compare the quality of the output data. And the fourth tool was based upon using image processing and optical character recognition techniques to extract data from the images. The first two and the fourth tool was developed using open source Python scripting language and the third tool was built using Excel VBA. These tools were made with an aim to automate the processes that are time consuming, resource intensive and subjected to human error. Apart from these tools I had also carried out the literature review on “Fuel Cell Technology” and “Modelling of Hyperelastic Materials in Abaqus”.

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

Objectives of the project: The broader objective of my internship was to assist various team members in simplifying complex and repetitive tasks for the purpose of making their work more efficient and increase productivity. This was achieved by developing task specific tools.

Major learning outcomes: Extensively used and learned various Python modules and also learned to code using Visual basic for application.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The company provides an open and honest working environment, which I believe is essential for effective

communication between employers and employees. The company encourages individuals to develop competencies which are required for the successful execution the project. Efficacious individuals are recognized and rewarded for their effective and honest efforts. The company expects every individual to work with honesty and integrity.

Academic courses relevant to the project: None.

Name: SHOBHIT NAGAICH(2018H1410160P)

Student Write-up

Short summary of work done during PS-II: 1. MPP Decomposition (Project 1): MPP is a special version of LS-Dyna, that is developed to run on a number of computers connected in a network. For large models, it is necessary to have large computer resources to finish a simulation in an acceptable time. MPP decomposition can be used to manually control the default RCB decomposition by controlling the region as well as the direction of decomposition.

MPP decomposition depends majorly on two factors,

- ☐ Geometry of the model
- ☐ Loading direction

2. Rear door trim method development (Project 2): Rear door trims are interior parts made up of plastics and these are the primary source of injuries for the occupant during the side crash and it can also block or damage the airbag deployment. It is very much necessary to identify and solve the potential problems in the early stages of development.

Objectives:

- ☐ To determine the behavior of door trim in IIHS barrier side crash.
- ☐ Performance evaluation of decorative and armrest parts.

Tool used (Development tools - H/w, S/w): S/w: LS-dyna, ANSA, Animator.

Objectives of the project: 1) MPP Decomposition (Project 1): To reduce simulation time 2) Rear door trim method Development (Project 2): To analyse the behavior of rear door trim in IIHS Barrier side crash loadcase.

Major learning outcomes: 1. Able to understand about the decomposition done by the LS-Dyna and how we can reduce the simulation time by changing the default decomposition.
2. Able to analyze the behavior of specially door trim in the side crash.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment of the company is entirely healthy and motivating because of the following factors,

1. Challenging tasks assigned.
2. Co-operative team.
3. Experienced working professionals.
4. Helping management.

Academic courses relevant to the project: FEM (Finite Element Method), Material science.

Name: NIKHIL ATUL NARALE(2018H1480180H)

Student Write-up

Short summary of work done during PS-II: My job was to develop a CFD method for predicting water separation efficiency of an air intake duct. The tasks, I was assigned was Literature review, Understanding problem statement, Pre-Processing (Surface repair and wrapping), Simulations and post processing.

Tool used (Development tools - H/w, S/w): Star-CCM+.

Objectives of the project: Objective: To develop CFD methodology for predicting water separation efficiency of air intake duct using multiphase approach in star CCM+ and to validate the developed method using experimental data. Further, recommend new designs to Daimler trucks.

Major learning outcomes: Multiphase flow analysis, hands-on experience in Star-CCM+, Surface preparation.

Details of papers / patents: Manuscript in the preliminary stage of preparation.

Brief description of working environment, expectations from the company: The name itself says everything. The working environment and work culture is very impressive. Everyone will be ready to help you out if you are stuck somewhere. They will be providing you with the basic training of the tools and software that would be needed for the project. You will be having bi-weekly or monthly meeting with your manager, but this depends on your team that you have been assigned to. Your team will involve you and push you to take part in different activities. Last but not the least, the cafeteria is clean and well maintained and the food is also good.

Academic courses relevant to the project: CFD, Fluid dynamics.

Name: Raool Anuj Rajesh(2018H1480185H)

Student Write-up

Short summary of work done during PS-II: After the Induction, we are associated with different teams working on different projects. It was a great experience learning about the project and learning to use various software used by company with the support of mentor and guide, at the company, the complete phase in company went quite thrilling.

Tool used (Development tools - H/w, S/w): OpenFoam, Blender, StarCCM+, SALOME.

Objectives of the project: Establish end to end aerodynamic workflow using opensource software.

Major learning outcomes: Through study on aerodynamics of vehicle, Meshing consideration for vehicular body.

Details of Papers/patents: N.A

Brief Description of working environment, expectations from the company: Great Working Environment to learn, Supporting colleagues

Academic courses relevant to the project: Computational Fluid Dynamics, Fluid Dynamics

Name: B VIJAYASARATHY(2018H1480188H)

Student Write-up

Short summary of work done during PS-II: Development of new open source script to predict and mesh the geometry. Automation of meshing the simple geometrical surface. New tool development using Python. Knowledge of machine learning for prediction of data.

Tool used (Development tools - H/w, S/w): Gmsh, NX, Python3.

Objectives of the project: The objective of the work is to generate a script using open source meshing tool in order to completely automate meshing process. Create foundation for generating automated intelligent meshing using machine learning technique.

Major learning outcomes: Discovering meshing tools which are portable, light and free to use to help designing of the products. To bring in automation in to area of CAE meshing to help the future needs. Development of new open source tools that removes manual intervention to the meshing.

Details of papers / patents: NIL.

Brief description of working environment, expectations from the company: Good work atmosphere, friendly colleagues, good work culture, flexible timings, breakfast and lunch.

Academic courses relevant to the project: CAD, Python3, Matlab, CFD, FEM.

Name: SHUKREY SARTHAK MUKUND(2018H1480194H)

Student Write-up

Short summary of work done during PS-II: Methodology development for hybrid RANS/LES simulations.

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

Objectives of the project: Torque optimisation.

Major learning outcomes: 3D turbulence modelling, Meshing, Surface repair mode, CFD principles etc.

Details of papers / patents: Selected for SAE world congress conference, 2020.

Brief description of working environment, expectations from the company: MBRDI provides a constructive working environment. Managers and mentors were very supportive. They expect you to have basic and strong knowledge of the subjects to taught in our curriculum.

Academic courses relevant to the project: Fluid dynamics, CFD, etc.

PS-II Station: Micron Technology India Operations, Hyderabad

Faculty

Name: Gopala Krishna Koneru

Student

Name: R NIRANJAN(2016A3PS0236P)

Student Write-up

Short summary of work done during PS-II: Solutions development for software compatibility issues. Code migration for GUI from python 2 to 3 and qt4 to qt5. Converting skill code to PyQt to simplify adding further features to GUIs. Training modules on using Cadence tools.

Tool used (Development tools - H/w, S/w): Python, Qt programming, Cadence virtuoso.

Objectives of the project: Training for actual job, company projects (problems faced by other teams within the department).

Major learning outcomes: Simple GUI creation using PyQt learnt, various tools in virtuoso learnt in order to solve problems related to schematics and layouts.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Excellent workplace, work from home transition also carried out effectively, friendly colleagues.

Academic courses relevant to the project: Analog and Digital VLSI design, Digital design, Computer programming.

Name: PATCHIGOLLA SPANDANA(2016A3PS0327H)

Student Write-up

Short summary of work done during PS-II: Firmware development.

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

Objectives of the project: Programming NAND.

Major learning outcomes: Firmware concepts.

Details of papers / patents: NA.

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

Academic courses relevant to the project: C programming, Embedded systems, OS.

Name: MOHAMMED HAMED AHMED(2016AAPS0222H)

Student Write-up

Short summary of work done during PS-II: My internship involved learning the methodology deployed for the verification of the design and with the knowledge of this verification methodology, I debugged errors in different projects of our team.

Tool used (Development tools - H/w, S/w): Universal verification methodology, JAVA, C++.

Objectives of the project: Verify that the system requirements and specifications are met.

Major learning outcomes: System verilog, Universal verification methodology (UVM) and Design verification using UVM.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: You will be treated as an employee and the projects provided will surely help boost your knowledge. People here are always willing to help you regardless of the complexity of the issue. My manager gave me ample time to acquire the necessary skillset for my project.

Academic courses relevant to the project: Electronic devices, Analog and Digital VLSI design and Object oriented programming.

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

Faculty

Name: Belde Vinay

Student

Name: HITEN KUMAR BEHERA(2018H1230221H)

Student Write-up

Short summary of work done during PS-II: I was working in SVG team which validates the silicon. During my internship period, I was assigned to test the functionality of GPIO (General Purpose Input Output) as well as LSRAM (Large SRAM). Using the Libero tool I had to make different designs which would be further synthesized. Then after placement and routing a staple file (bit stream) would be generated. Device was programmed through this. Then using Softconsole tool I used to validate my design with help of embedded C programming.

Tool used (Development tools - H/w, S/w): Libero, Softconsole, Verilog, Embedded C, PolarFire Soc.

Objectives of the project: Test the different modes of GPIO (GPIO as Input, Output, IN-Out, Interrupt) as well as LSRAM (Dual port, Two port).

Major learning outcomes: a) Libero design flow b) How validation is done for the Soc peripherals and on chip memory.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: It was a very nice place to learn cutting edge technology and grow. It provides a challenging environment with great opportunities. One can expect a supportive and collaborative team. Work load will be there for few hours but can be done with flexible work environment.

Academic courses relevant to the project: VLSI architecture, Reconfigurable computing.

Name: BHATIA KUNAL VINOD(2018H1240080H)

Student Write-up

Short summary of work done during PS-II: The project which was assigned to me was to enhance the performance of APB4 VIP which they are designing. It involves understanding of files written by my predecessor and see exactly how this works, suggesting what modification that can be done so that more functionalities can be verified of APB protocol and determining how many assertions can be developed to verify whether the signal levels are stable throughout the transaction or values of those signals. Then, I developed some testcases in addition to the existing testcases and developed assertions for the above fore mentioned problem.

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

Objectives of the project: To verify more functionalities of APB4 protocol such that more functionalities can be verified and also by developing we have one more objective, to reduce the reliance of company over third party VIPs.

Major learning outcomes: Understanding APB protocol, Understanding SystemVerilog and UVM and implementing those concepts for this project.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment was nice. The environment let me to learn new things, my manager and mentor

made ensure that I am not facing problem. In case of difficulty I can approach them and my problem gets resolved. Even colleagues were helpful, they have good knowledge of the work they do and also they explained me the things in a simpler and understandable fashion. The environment was in such a way that it stuck the chord of work- life balance. So, overall the environment was good and conducive for learning and making mistakes yet sensible ones.

Academic courses relevant to the project VLSI design, Reconfigurable computing.

PS-II Station: MiQ Digital India Pvt. Ltd., Bangalore

Faculty

Name: Mohammad Saleem J Bagewadi

Student

Name: SACHIN RAGHUNANDANA PERURI(2015B5A40650H)

Student Write-up

Short summary of work done during PS-II: Data analysis of digital advertising campaigns was conducted and pitching company products to clients. Multiple projects worked on that involved data analysis, data visualization and data prediction.

Tool used (Development tools - H/w, S/w): R, Python, Redshift, S3, Excel, PowerPoint.

Objectives of the project: Maximizing client revenue and visualizing advertising campaign related data.

Major learning outcomes: Data analysis, Time series modelling, Machine learning.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Excellent working environment, great people, free food and drinks.

Academic courses relevant to the project: Machine learning.

PS-II Station: Morgan Stanley Advantage Services, Mumbai

Faculty

Name: Ambatipudi Vamsidhar

Student

Name: Risheek Sood(2015B3AA0562H)

Student Write-up

Short summary of work done during PS-II: Automated the validation process for capital and risk planning models using Python. Made a model developer document checker and review document check for various template related checks, if it is in accordance to the template provided internally or not and to extract information from it. Made easy sql query machine by attaching it with html interface to build any query for user to get data from database. Did scraping from internal websites to get some data from them. All this information now collected was supplied in report format for better and faster decision making.

Tool used (Development tools - H/w, S/w) Python, Sql, Pycharm, HTML.

Objectives of the project: Checking model developer document and review document against the template provided internally by the firm and extracting information from them. Extracting info from database by queries and from some internal websites by scraping.

Major learning outcomes: Understood the model review process at the firm, did web scraping, implemented various new python libraries, automated various parts of the review process so got to know which firm resources / information is used for several processes in MRM.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Long hours for interns, some projects are very interesting, work timing is good.

Academic courses relevant to the project DBMS, OOP.

PS-II Station: MM Aqua Technologies, Gurgaon

Faculty

Name: Nithin Tom Mathew

Brief write-up on each PS-II station: MM AQUA, provides a complete solution regarding cooling tower, water and waste water treatment. They offer complete gamut of technologies, project management and engineering solutions covered under one roof various products which gives a complete effluent treatment. They have extensive range of products and services coupled with its design and build capabilities, meet the diverse needs of both water & waste water and cooling tower industry. They are dedicated towards our quality production and to deliver end to end innovative, cost effective and reliable solutions to our customers everywhere. With 28 years of vast experience in the field of water and wastewater treatment, cooling tower business. They are always committed to give Eco friendly solutions. The aim is to provide solution with optimum energy, minimum chemical usage and maximum re claim as well as lower carbon foot print. The students work on various areas of manufacturing domain with the expert opinion from the mentors. They work on various optimization works to improve the performance of various machinery. The students also involve in various aspects of an industry starting from knowing about the material to final product development. The basic knowledge of design, manufacturing management will be good.

Brief write-up on each PS-II station: MM AQUA, provides a complete solution regarding cooling tower, water and waste water treatment. They offer complete gamut of technologies, project management and engineering solutions covered under one roof various products which

gives a complete effluent treatment. They have extensive range of products and services coupled with its design and build capabilities, meet the diverse needs of both water & waste water and cooling tower industry. They are dedicated towards our quality production and to deliver end to end innovative, cost effective and reliable solutions to our customers everywhere. With 28 years of vast experience in the field of water and wastewater treatment, cooling tower business. They are always committed to give Eco friendly solutions. The aim is to provide solution with Optimum energy, Minimum chemical usage and Maximum Re claim as well as lower Carbon Foot Print. The students work on various areas of manufacturing domain with the expert opinion from the mentors. They work on various optimization works to improve the performance of various machinery. The students also involve in various aspects of an industry starting from knowing about the material to final product development. The basic knowledge of design, manufacturing management will be good.

PS-II Station: Morning Star - Index New Product Development, Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: MIHIR KUMAR(2015B3A30564H)

Student Write-up

Short Summary of work done during PS-II: Worked on various client and housekeeping work in the Indexes - New Product Development Team at Morningstar. Work entailed the development of various Beta and Strategic Beta investment portfolios with equities and other fixed investment instruments.

Tool used (Development tools - H/w, S/w): S/w : Python, SQL, SQL Server, AWS Athena, AWS Glue, AWS Athena, AWS S3, Excel

Objectives of the project: To build various Beta and Strategic Beta products for various clients such as fund managers, mutual funds, pension funds etc.

Major learning outcomes: Build and manage various Beta and strategic Beta portfolios using financial data and various tools.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Great working environment, supportive team mates and senior executives. Overall great place to work.

Academic courses relevant to the project: Financial risk analytics and management, Business analysis and valuation, Econometrics, Security analysis and Portfolio management.

PS-II Station: Morningstar - Index Technology, Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: NAMJOSHI MAYUR SHRIPAD(2018H1120290P)

Student Write-up

Short summary of work done during PS-II: Initially I worked on GQL (Graph Query Language). Then, I documented some REST APIs with the help of SWAGGER API. Then, I developed some ETL processes by using AWS Glue, AWS S3, AWS RDS.

Tool used (Development tools - H/w, S/w): Eclipse, STS (Spring-Tool-Suite), VSCode, Pycharm, DBVeaver.

Objectives of the project: We had to develop an ETL (Extract-Transform-Load) process that will take the data from server, store it in our S3 bucket and ultimately store the data in form of tables in our AWS RDS database.

Major learning outcomes: I learnt a lot of new things about source code management. I got to work on the project right from the scratch, so I got to learn how the major project gets developed in an organization. I also got to work upon Amazon web services like S3, RDS, Glue.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Wonderful working environment! Team is very helpful, all you have to do is just ask! I was always asked whether I was comfortable with my work. Any of the team member was always there had I faced any issue.

Academic courses relevant to the project: Cloud computing, DBMS.

PS-II Station: Morningstar - Quantitative Research, Mumbai

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: VISHAL BHARDWAJ(2016A3PS0099G)

Student Write-up

Short summary of work done during PS-II: ICA Model - Moments evaluation and validation; Chatbot initiative on Amazon Lex, Lambda functions, Athena etc; Best K stocks, Transaction costs modelling.

Tool used (Development tools - H/w, S/w): Python, Cvxpy, Ipopt, Amazon Lex, Athena, Lambda functions.

Objectives of the project: ICA Model - Moments evaluation and validation; Chatbot initiative on Amazon Lex, Lambda functions, Athena etc; Best K stocks, Transaction costs modelling.

Major learning outcomes: Convex optimization using Python, Developing a chatbot.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Very friendly and open working environment. Supportive mentors and team members. Flexible working schedule.

Academic courses relevant to the project: DRM, SAPM.

PS-II Station: Myntra.com, Bangalore

Faculty

Name: Vineet Kumar Garg

Student

Name: ANKIT PANDEY(2016A4PS0847P)

Student Write-up

Short summary of work done during PS-II: The work included but not restricted to the following,

- 1) Identification of key factors, metrics, hypotheses generation, data manipulation, exploratory analysis, application of relevant tools and techniques to get desired results and insights.
- 2) Scheduling and monitoring of jobs while ensuring these are refreshed at the required frequency to feed into analyses and dashboards.

- 3) QC to check for potential data issues, code errors, calculation errors, incomplete or insufficient conditions.
- 4) Creation of new dashboards and improvising existing ones to help keep track of key metrics and perform RCAs.
- 5) Responsible for building automated reports to help monitor important measures and point out any anomalies in a short time span.
- 6) Leveraging ML models for solving business problems.

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

Objectives of the project: The objectives are listed below: 1) Data ETL: Extracting data and transforming it into a meaningful form (metrics, KPIs) to derive insights from the data and representing them on dashboards 2) RCA: Performing root cause analysis to deep dive into the data.

Major learning outcomes: 1) Advanced knowledge of data manipulation tools like SQL.
2) Advanced knowledge of data modelling in Python.
3) Proficiency in building dashboards by identifying key metrics and apt visualization techniques.
4) Applied knowledge of statistical techniques like hypothesis testing, linear regression etc.
5) Good understanding of business functions and ability to translate a business problem into an analytics task, providing data-driven solutions to the same.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The work culture at Myntra is very relaxed. There aren't restrictions regarding dress code and work timings. Besides, people are supportive and highly experienced in their fields. There are also sessions where interns are taken to the warehouses so that they have a holistic overview of operations at Myntra. The team's only expectation is eagerness to learn and displaying sincerity with work. At no point of time is an intern treated differently from a FTE, be it with the benefits or responsibilities.

Academic courses relevant to the project: Machine learning (not mandatory).

PS-II Station: Nagarjuna Construction Company, Hyderabad

Faculty

Name: Naga V K Jasti

Student

Name: ABHISHEK ASHOK DAHELKAR(2018H1300080P)

Student Write-up

Short summary of work done during PS-II: Was involved in all related activities in construction of Expressway.

Embankment, Subgrade, Sub-base, DLC, PQC, ROB, Pilling.

Quality assurance / Quality control, Planning & management, Estimation, Costing & billing.

Tool used (Development tools - H/w, S/w): None.

Objectives of the project: Construction of Nagpur-Mumbai super communication expressway.

Major learning outcomes: Construction of pavement quality concrete expressway. In depth understanding of technical subjects, IRC & MoRT&H.

Details of papers / patents: None.

Brief Description of working environment, expectations from the company: Tough to work in on site project, challenges physically and learnt whole lot of new things.

Academic courses relevant to the project: Highway construction practices, Pavement analysis & design, Pavement materials & testings.

Name: ABHISHEK ASHOK DAHELKAR(2018H1300080P)

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Details of papers / patents: None.

Brief description of working environment, expectations from the company: Tough to work in on site project, Challenges physically, Learnt whole lot of new things.

Academic courses relevant to the project: Highway construction practices, Pavement analysis & design, Pavement materials & testings.

Name: DIPANKAR GHOSH(2018H1300087P)

Student Write-up

Short summary of work done during PS-II: I learnt various site activities like DLC, PQC, Surveying, Structures, Batching Plant and more.

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

Objectives of the project: To learn the dynamics of a real construction site.

Major learning outcomes: DLC, PQC, Surveying, Structures, Batching Plant and more.

Details of papers/patents: NA.

Brief description of working environment, expectations from the company: THE WORK CONTINUED IN THE COMPANY FOR THE WHOLE DAY AS SOME ACTIVITIES WERE CARRIED OUT IN DAY AND SOME IN THE NIGHT TIME.

Academic courses relevant to the project: HIGHWAY CONSTRUCTION PRACTICES.

Name: ARCHIT GARG(2018H1300090P)

Student Write-up

Short summary of work done during PS-II: We worked on various projects including (but not limited to) DLC, PQC, PILING, SURVEYING, BATCHING PLANT, GABION WALL, etc.

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

Objectives of the project: TO LEARN HOW THE ACTIVITIES ARE CARRIED OUT ON ACTUALY ON SITE.

Major learning outcomes: We learnt various construction activites.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The work in the company is carried out 24*7 amd it is based on the availability of machinery and the environmental conditions.

Academic courses relevant to the project: Highway construction practices.

PS-II Station: National Centre for Biological Sciences, Bangalore

Faculty

Name: Bharathi R

Student

Name: KANNAN A(2016A5PS0484P)

Student Write-up

Short summary of work done during PS-II: Nef is an auxillary protein that contributes to the pathogenicity of HIV/AIDS. Many pathways are involved through which Nef achieves this and they are still being studied. This project deals with expression and purification of the protein from both subtype B and C and present a comprehensive comparative study on their function and structure.

Tool used (Development tools - H/w, S/w): Unicorn 6 software, TECAN evo, Snapgene.

Objectives of the project: To compare and contrast the differences in the structural and functional characteristics of Nef protein between subtype B and C of HIV-1.

Major learning outcomes: Protein purification, transformation, cloning, scale up culture, affinity chromatography, gel electrophoresis, ELISA, FPLC.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: People here are friendly and the working environment is social. The lab is a collaborative environment where different teams with different goals are put up under the same roof. The learning curve at this

organization was amazing. People with pharmacy and biology background could get ample opportunities to develop their research career forward.

Academic courses relevant to the project: Molecular biology, Biochemistry, Instrumental methods of analysis.

Name: ANKUSH BHARDWAJ(2018H1290010P)

Student Write-up

Short summary of work done during PS-II: Planarians (*Schmidtea mediterranea*, Phylum Platyhelminthes) are brown coloured bilaterally symmetrical metazoans, living in fresh water and had been documented for their mysterious regenerative ability and can regenerate from the smallest possible fragments. They are capable of regenerating any missing body part in process requiring stem cell (neoblast) and positional information. The planarians acquire variable structural properties and gene expression profiles during regeneration. Many genes are involved in the wound healing, pattern recognition, Cell proliferation, Organ/tissue regeneration and morphallaxis. Knockdown study of various genes uncovered the essential genes for regeneration, RNAs are isolated from whole organism by trizol method, and subjected to cDNA synthesis. The cDNA is later used for T7 Primer/Specific gene amplification in order to synthesize dsRNA which shall be used for RNAi study. The gene under study is involved in the head and muscle regeneration and whose knockdown would lead to serious perturbations in the regeneration of planaria. The RNAi knockdown is done by either feeding or injecting the planaria in periodic paradigm as designed and expected to give desired results; which were to be validated by WISH and Confocal imaging.

Tool used (Development tools - H/w, S/w): RNA Knockdown, PCR, Nano-Ject, Confocal Imaging, qPCR, RT-PCR.

Objectives of the project: To study Medio-lateral Regeneration in Planaria.

Major learning outcomes: • Bioinformatic approach to perform preliminary analysis of the gene and gene under study.

- Primer designing for the putative gene whose character under study.
- Planarian (live animal) maintenance and culturing.
- RNA isolation from whole animal in homeostasis and regenerating animals.
- cDNA synthesis (RT PCR).
- Gene isolation and amplification by PCR technique and quantitation.
- dsRNA synthesis.
- RNAi knockdown experiments (Feed/Nano-ject/Amputation).
- WISH (Whole in-situ Hybridization) and Immuno-histo staining.
- qPCR to quantify and study relative expression.
- Confocal Laser Scanning Microscopy to image the WISH.
- BSL2/3 trained for COVID19 task force (Sample aliquoting and RNA extraction).

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: InStem or NCBS follows a open lab culture system, maximizing the work potential of an individual. The peers are helpful and supportive. You can expect a witty guidance from them. Talking about expectation, they do look for the academic conceptual strength and creativity along with perseverance in the upcoming lab members.

Academic courses relevant to the project: Advance cellular and molecular biology, Molecular mechanism of gene expression, Stem cell and regenerative biology and advanced recombinant DNA technology as in subjects and experiments. All the hard work done during Pragmatic courses like GET, RP, ET & SA.

PS-II Station: National Chemical Laboratory, Pune

Faculty

Name: K Santosh Sopanrao

Student

Name: GUPTA SURAJ PYARELAL MEENA(2018H1470316P)

Student Write-up

Short summary of work done during PS-II: The project involved designing of small molecules for Cancer and COVID-19. It was an application of the knowledge of Medicinal Chemistry and informatics. The idea was to design smart drugs for cancer that can effectively bind to the signalling molecules involved in the process of cell division. COVID-19 was a novel project as the virus was novel with diverse characteristics than the earlier known strains. We used various informatics and computational tools to filter out already existing drugs which may show efficacy towards COVID-19.

Tool used (Development tools - H/w, S/w): Schrodinger-GLIDE, ChemAxon, MOE, Autodock, ORANGE, Python.

Objectives of the project: To develop a smart drug for Cancer and drug re-purposing for COVID-19.

Major learning outcomes: Learnt various Informatics concept and basics of AI & ML.

Details of papers / patents: Yet to be published.

Brief description of working environment, expectations from the company: CISR-NCL being a research facility directly under the government, everything works in a well controlled and sophisticated manner. The facilities for students are very good. Vast learning and experimental facilities for any type of chemistry research work.

Academic courses relevant to the project: Yes.

PS-II Station: National Council for Cement and Building Materials, Ballabgarh

Faculty

Name: Mahesh K Hamirwasia

Student

Name: DEKIVADIYA ABHI PRAVINBHAI(2018H1060210P)

Student Write-up

Short summary of work done during PS-II: In national council for cement and building materials, Ballabgarh, there is one canteen. From here kitchen waste is obtained which can be utilized for better purposes. Purpose of the project is to create a biogas reactor on campus in the backyard of canteens will be beneficial. Kitchen (food) waste will be collected from canteen, NCB colony and a Housing society as feedstock for the digester. The anaerobic digestion of kitchen waste produces biogas, a valuable energy resource which will be used in canteen for cooking purpose to replace LPG cylinder being used for the same.

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

Objectives of the project: To create an organic processing facility by using kitchen (food) waste as a substrate to generate biogas, which will be more cost effective, eco-friendly, cut down on landfill waste, generate a high quality renewable fuel which will be used in cooking purpose.

Major learning outcomes: Learned about how a whole Installation project is to be carry out and the components it carries with it. Also, learned how to calculate the feasibility of the project.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment was quite good and supportive.

Academic courses relevant to the project: Thermodynamics, Advanced heat transfer, Chemistry.

Name: DESU RAHUL(2018H1300083P)

Student Write-up

Short summary of work done during PS-II: Structural optimisation design, Mix designs, IS / ASTM codes revision for the project UHPC.

Tool used (Development tools - H/w, S/w): Microsoft Excell, Word, Some other relavent to optimal work.

Objectives of the project: To Reaffirm codes, Development of new code books, Optimisation for mix designs.

Major learning outcomes: Understanding the existing codes and modifications.

Details of papers / patents: UHPC.

Brief description of working environment, expectations from the company: During my work, I meet different experts have good knowledge about designing, reading code / day make something special of the day.

Academic courses relevant to the project: Yes.

Name: PURVA DESHPANDE(2018H1440048P)

Student Write-up

Short summary of work done during PS-II: As, I joined in the month of March, and the project was already started from January. So, the main casting of the concrete samples were already done and my job was to just perform the tests on the samples and record the observation.

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

Objectives of the project: The project focuses on the suitability or possibility of usage of recycled coarse aggregates in concrete with the replacement of more than 30% without compromising the properties of conventional concrete.

Major learning outcomes: I basically learned thoroughly about all the properties and the testings done on the concrete sample.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: The working environment is quite friendly and enthusiastic. I have learned a lot from my senior mentors not only about the technical stuff but also about how to work effectively as a team.

Academic courses relevant to the project: Advanced concrete technology.

PS-II Station: National Council of Applied Economic Research, New Delhi

Faculty

Name: Gaurav Nagpal

Student

Name: RITWIK KINRA(2014B3A10308H)

Student Write-up

Short summary of work done during PS-II: I have worked on the development of questionnaires for India's first crime and victimization survey funded by the BPR&D, MHA, Gol. I, along with other team members, conducted the training of interviewers for the pilot survey, closely monitored the pilot survey in-field, redeveloped the listing, household and police questionnaires, prepared the field instruction manual, drafted methodology-related chapters of the final report. I have also had the pleasure of attending numerous talks, seminars, webinars, meetings with prominent government officials and events at NCAER or on NCAER's behalf.

Highlight glamour point for anyone considering NCAER: I had a private conversation with Dr. Raghuram Rajan, Former RBI Governor, and many former Chief Economic Advisors to the Gol. However, all of this was after numerous hours of selfless dedication and commitment to the work assigned to me by NCAER. So, yes, you have to be lucky, but at the same time have to be really good in your research approach, manner of presenting, and work very very hard.

P.S.: I was asked to do a course on questionnaire design (offered by the University of Maryland and University of Mannheim) by NCAER – supreme learning outcome. I also got offered a very prestigious and important research position at the end of my PS. I got the intern's stipend increased from 6.5K to 15.0K in the first two months of the PS.

Tool used (Development tools - H/w, S/w): Just use your brain and Google.

Objectives of the project: Household nationwide survey.

Major learning outcomes: Questionnaire design, Household surveys.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: I got lucky, but not everyone does. If you do not have prior research experience, you will be better off looking elsewhere. Having said that, if you're willing to work hard, it takes very little time to develop any kind of expertise. The working environment is extremely relaxed, but not so, if you want to do a lot of work. Lots to learn, in that case.

Academic courses relevant to the project: ECON F211, ECON F213.

PS-II Station: National Institute of Science and Tech. Dev. Studies (NISTADS), New delhi

Faculty

Name: Ritu Arora

Student

Name: ARCHIT SAXENA(2015B5A80525G)

Student Write-up

Short summary of work done during PS-II: The project deals with the research and development process of a framework for Technology Readiness Level (TRL) scale which shall act as a guideline scale for various government institutions. This scale would act as base which could be modified as per the need of the user, tailored as per the required industries to provide surgical solutions, and all these would still be along similar lines. TRL scales are widely used to track and aid the development of upcoming technologies. Hence, it is essential for a developing nation like ours to curate a adequately solid yet malleable framework to provide a starter culture for the rapid growth of upcoming technologies. In this report, we aim to study the already existing frameworks worldwide to understand the task of formulating a framework. This knowledge is then applied in building a general native TRL framework. We continue building upon this general framework to obtain TRL frameworks for water / ecology / environment theme, agriculture theme and biotechnology / pharma theme.

Tool used (Development tools - H/w, S/w): Microsoft Excel, Adobe Acrobat Pro DC, Microsoft Word, Microsoft PowerPoint.

Objectives of the project: To develop a model TRL scale. Customize the model to fit 3 themes namely – Water / ecology / environment, agriculture and biotechnology / pharma.

Major learning outcomes: The advancement process for technologies in general. A detailed view of the life-cycle of technologies in water / ecology / environment, agriculture and biotechnology / pharma industries. Research workflow in CSIR-NISTADS.

Details of papers / patents: The publication centers around developing a native TRL scale to act as a guide for designing industry specific scales. To demonstrate the utility of the model, it was used to build 3 different industry specific scales.

Brief description of working environment, expectations from the company: CSIR-NISTADS, New Delhi, is a policy research institute with projects spanning across almost all fields. The scientists in-charge of the projects are very supportive and encouraging in terms of novel approaches and disruptive ideas. The support staff is friendly and tends to the requests of the workers well. The work done in NISTADS is essential to the policymaking structure of our country. NISTADS helps young minds put their minds to the service of the nation by engaging them in projects which deal with the problems plaguing our country. Although, this is quite an honour in itself but I expect that in future CSIR-NISTADS could compensate their interns better. Also, I expect that in future, the projects they offer to the interns are more aligned with the interests of the interns as this would yield better results in my opinion.

Academic courses relevant to the project: HSS F361 - Urban policy and Governance, comes close to the theme of work being done at CSIR-NISTADS.

PS-II Station: National Instruments Systems (India) Pvt. Ltd., Bangalore

Faculty

Name: Rekha A

Brief write-up on each PS-II station: The students are working in various domains like VLSI, wireless communication etc. Some of projects they are working are in the analysis of throughput of the HSDPA channel, 4G MAC layer, implementing non-coherent interconnect component with R class CPUs, System compliance for ARM based servers, Design of static RAM cell, verification / validation etc. Initially, the students were given training by the organisation on the various tools and technologies used. Students worked on various tools and languages like C, python, Linux / UNIX, verilog, Labview, computer architecture, shell scripting. Awareness of scripting languages, programming concepts and computer Architecture are the areas the organisation is looking at for the various projects.

Student

Name: DHRUV SAITH(2018H1240107P)

Student Write-up

Short summary of work done during PS-II: I was put in the RF driver validation and verification team. One of the basic tasks that the team does is to perform regression testing on different software products, which is critical before actually presenting the software to the customer. My project was to build a system that would be able to predict the outcome of most of the tests without actually performing the tests using machine learning algorithms. The system was expected to significantly reduce the time of the testing process, hence also reducing the incurred cost and the human effort.

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

Objectives of the project: To build a system that would help reduce the time, cost and human effort involved in regression testing.

Major learning outcomes: Understanding the entire testing process, Implementation of machine learning algorithms using a scripting language, learning about the ELK stack and how to access it using a scripting language, learning how to use LabVIEW.

Details of papers / patents: In the process of writing a research paper.

Brief description of working environment, expectations from the company: The working environment of the company is very good and they encourage you to have a good balance between work and personal life. Also, the people are really helpful and understanding. The company expects the students to be honest, enthusiastic and diligent towards their work. They encourage the students to come up with some out of the box solutions to the problems assigned to them.

Academic courses relevant to the project: Introduction to artificial neural networks.

PS-II Station: NCPE infrastructure India Pvt. Ltd., Hyderabad

Faculty

Name: Naga V K Jasti

Student

Name: ABHISHEK KUMAR(2018H1430031H)

Student Write-up

Short summary of work done during PS-II: I was able to understand the structural drawings of residential & commercial buildings (given in AUTOCAD) given to me by the company employee / project supervisor & use them for the modelling, analysis & design of the structures under consideration using ETABS & STAAD PRO, while following the guidelines of Bureau of Indian Standards (IS Codes) regarding structural analysis, design & detailing. I would get my work approved at various stages of the project such as pre - requisite research, & plan study,

modelling, analysis, design & detailing. Overall, the atmosphere of the company was conducive to my work.

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

1. AUTOCAD 2019 2. ETABS 2015 & ETABS 2016 3. STAAD PRO V8i SS5 4. MS Office (Word, Excel, PowerPoint).

Objectives of the project: To carry out analysis and design of commercial & residential buildings using softwares such as AUTOCAD, ETABS, STAAD PRO & following the guidelines prescribed by Indian Standard Code, also gained in-depth understanding of above mentioned softwares.

Major learning outcomes: 1. To understand the architectural plans given in AUTOCAD.
2. To know about column positioning & orientation & centreline diagrams.
3. To identify the sections most economical for structural design.
4. To design the structures resistant to earthquake & wind loads.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: I was assigned structural drawings (plan, section, elevation in AUTOCAD) of various structures such as commercial & residential buildings, circular water tanks, retaining walls, etc. for which, after undertaking in-depth research & study, I had to carry out modelling, analysis & design of the whole structure (buildings) or components such as cover slab. I could ask my doubts regarding the project at proper intervals & got sufficient time to complete the projects at my own pace. I got feedback on my progress & regular help from my project supervisors.

Academic courses relevant to the project: 1. Design of RCC structures 2. Design of steel structures 3. Earthquake engineering 4. Structural dynamics 5. Design of multi-storey structures.

Name: HARSHIT GARG(2018H1440041P)

Student Write-up

Short summary of work done during PS-II: I have worked on two projects which are as follows. First is the design of underground sewage drains and storm water drainage and second is Delhi Jal board project. During my time, I got to learn about the requirements and the code which is being followed for the design of UGD and SWD. I also handled some part of RFP where population forecasting was included. I have also gone for sample collection to Vijayawada with a team so as to find out the efficiency of STP there which found out to be very useful, the task was done in order to find out that whether there is a need for upgradation of the facility or not.

Tool used (Development tools - H/w, S/w): Land desktop, Arcgis.

Objectives of the project: Design of UGD and SWD.

Major learning outcomes: Manual learning and various requirements for the design.

Details of papers / patents: Due to confidentiality no details regarding the paper work is allowed to discuss.

Brief description of working environment, expectations from the company: The working environment was very good and everyone was willing to help.

Academic courses relevant to the project: Some of the subjects were relevant.

PS-II Station: NetApp, Bangalore

Faculty

Name: Mohammad Saleem J Bagewadi

Student

Name: Pawar Ajinkya Nandu(2018H1030048G)

Student Write-up

Short summary of work done during PS-II: Worked on 2 project units. First one was to perform assessment of CVEs and suggest any mitigation measures. Second project was to bridge the test gap of the platform components by building, integrating and automating the necessary tools for test requirements.

Tool used (Development tools - H/w, S/w): Solidfire node and cluster, Git, Jenkins, AHCI, Firmware update automation, Gentoo ebuids.

Objectives of the project: To assess the CVEs, provide mitigation measure and to build, integrate and automate tools for platform component testing.

Major learning outcomes: Platform components knowledge like firmware upgrade cycle and memory mapped I/O. Gentoo ebuild and management.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The work environment was superb. Everyone was really helping and down to earth. Everyone has the same cubicles which helps keep this work culture perfect. All my expectations were fulfilled as I got to work on latest products in the platform development and everyone was very welcoming.

Academic courses relevant to the project: Data storage and Network technologies, Computer architecture, Computer networks, Operating systems.

Name: PIYUSH NIKAM(2018H1030057G)

Student Write-up

Short summary of work done during PS-II: Worked in the ONTAP team (operating system) of NetApp. The team is developing SnapMirror technology which is a cross-platform replication technology. Worked on ONTAP mediator which acts as tie-breaker in multi-node clusters. Also, I worked on an internal project aimed at analyzing and predicting critical sections of a project.

Tool used (Development tools - H/w, S/w): VED, Perforce, VSim, Visual studio code, OpenGrok, Anaconda, Sklearn, Numpy, Pandas.

Objectives of the project: ANALYSIS AND PREDICTION OF CRITICAL SECTION OF A PROJECT.

Major learning outcomes: Learned about public and on-prem Cloud - protection, replication, backup.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The work environment of the company is amazing and team members are really helpful. Before every project, in-depth knowledge transfer sessions are arranged. Work-life balance is taken into consideration and sufficient time is given to complete the task. The company expects that developed products must have high availability (99.9999%) hence every code commit is exhaustively tested.

Academic courses relevant to the project: Cloud computing, Advance OS, Machine learning and Data mining.

Name: Vasu Sheoran(2018H1030061G)

Student Write-up

Short summary of work done during PS-II: Traditional backup and restore technologies based on streaming data protection devices, such as tape or streaming disk devices that emulate tape, don't use storage-based snapshot technology. As a result, these technologies can be very slow in response and are resource intensive. Ingesting large amounts of data is one strength of these devices. So, how do you easily manage backups across disparate applications and infrastructures with delegated management to application or database owners, without sacrificing control or oversight, and do it at scale?. NetApp SnapCenter software is a unified, scalable platform for data protection. SnapCenter provides centralized control and oversight, and enables users to manage application-specific backup, restore and clone operations. By using SnapCenter, database, storage and virtualization administrators learn a single tool to manage backup, restore and clone operations for a variety of applications, databases and VMs.

Tool used (Development tools - H/w, S/w): Visual studio 2012, C#, ASP.NET, Perforce, Review board, PowerShell, NUnit, TypeMock.

Objectives of the project: To improve log collection for efficient debugging and analysis.

Major learning outcomes: Understanding of company culture and work life balance. Also got on-hand experience with various tools and technologies.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: It was great working under the guidance of Ajay Bakhshi. Overall, the company provides a very open environment to help interns get used to the company culture. People are supportive and ready to help in case required.

Academic courses relevant to the project: Cloud computing.

Name: BHOJANI HARSH PRAKASHBHAI(2018H1030125P)

Student Write-up

Short summary of work done during PS-II: Worked on NetApp's SnapCenter and it's plugins, specially on Oracle and SAP HANA, developed some feature and fixes product bugs for the same.

Tool used (Development tools - H/w, S/w): VED (virtual engineering desktop), Helix visual client (P4V), Visual studio - 2012, Eclipse for JAVA, Internet Information Services (IIS) manager, Putty (ssh client for windows), VNC server.

Objectives of the project: NetApp's SnapCenter and it's plugins.

Major learning outcomes: Understood the workflow and the behavior of the product and tools revolves around the product.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Everyone is helpful, and motivate you to do your work, and complete things on time, it's a great place for work, campus and people are wonderful, good work-life balance maintained.

Academic courses relevant to the project: Operating system, Data structure, Computer networks, JAVA, C#, JS, Good understanding of Linux based OS.

Name: ANKUR VINEET(2018H1030144P)

Student Write-up

Short summary of work done during PS-II: I was working with the storage efficiency team. Storage efficiency techniques reduce the data footprint on disk and save space and cost of

storing data. These mechanism have an overhead on performance while trading off the savings. The impact of this overhead can be reduced by tuning the parameters of efficiency techniques like compression, deduplication and compaction.

My project title was "Cold To Hot Data Migration". Data blocks are categorized as cold (inactive) and hot (active), based on this categorization efficiency policies are implemented. But due to the dynamic nature of the data, this categorization also changes. Cold to Hot data migration is one such instance in which the cold data which is compressed heavily becomes hot. To improve the random read performance, we perform the graceful migration by converting the compression to a format which incurs less overhead while reading the data block. The selection of such data blocks is also important as it must pay off the time invested during the migration process in future reads. The Overall balance of performance and savings should be achieved using this process.

Tool used (Development tools - H/w, S/w): Development Language: C, Tools: Vim, Cscope, GDB, Perforce.

Objectives of the project: Establish balance between storage efficiency and performance overhead.

Major learning outcomes: File system (WAFL), Storage efficiency techniques.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The company has a good learning environment and the teammates are always ready to help with the work. The work allotted to me was aligned with the overall project the team was working. The expectation from the company is similar to what they expect from a regular employee, in terms of quality and timeliness of the work.

Academic courses relevant to the project: Network programming, Operating system.



PS-II Station: Netcore Solutions, New Delhi

Faculty

Name: Ritu Arora

Student

Name: SAIJUMI MUKHERJEE(2018H1490340P)

Student Write-up

Short summary of work done during PS-II: Maintaining relationships with the clients through continuous interaction with them.

Assuring that the clients are being consulted upon the industry best practices, ongoing trend etc.

Checking on the delivery services by ensuring high delivery rate, open rate and click rate for their email campaigns through cross-team coordination within the organization.

Assuring that the weekly and monthly goals that are set for the above brands are met and the KPIs are achieved.

Actively involved in ideation and execution of effective campaigns for brands to drive traffic and revenue.

Exploring the best of analytics to help the associated brands better their user engagement and retention strategy.

Tool used (Development tools - H/w, S/w): Netcore-Smartech, Ms-Excel, Ms-Powerpoint.

Objectives of the project: 1. Understanding the product 2. Industry study and analysis 3. Understand and fulfil Client KPIs 4. Enable cross-sell and up-sell.

Major learning outcomes: • Cross - Functional management / Communication with different department of the firm like SMARTECH support, Delivery team, Business analysis Dept, Sales Dept, SMARTECH Helpdesk etc.

- Customer query handling regarding SMARTECH and providing expert opinion on how to use it to its maximum efficiency for better ROI.

- Cross selling SMARTECH's additional features which is a part of its enhanced SDK.

- Sales pitch by helping the enterprise sales team as a SME in understanding the business requirements of the clients and addressing them through carefully prepared use cases.
- Creation and updating of marketing automation journeys based of specific uses.
- Cases according to the Industry.
- Formalizing strategies driven by insights obtained through Email, BPN campaigning and automation journeys.
- Domain expertise (complete knowledge about Netcore's marketing growth platform SMARTECH and its AI modules and genuine updated knowledge about marketing automation and digital marketing).
- Effectively learned (and continuing to learn) how to tackle complicated Issues and work in harmony to diagnose and solve it.
- Learned how to handle clients, ensuring to maintain high standards of performance, service and consultancy.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: I had joined Netcore's CSM team in Gurgaon in January this year and I must say it has been a wonderful journey so far. The initial on-boarding and training took place in Mumbai, where I learnt about the different teams at Netcore, their functions, processes etc. Every team member was super-cool and was always happy to answer my question and clear my doubts. And then, I moved to the Gurgaon office but sadly within a month we were all facing a new challenge of COVID-19. I had never worked with a virtual team, so work-from-home seemed like an alien concept. But, everything was handled by the management in order to make work-from-home as productive as a regular day at work. I received constant guidance from my seniors, manager and even the department head and it never felt like my learning had stopped or taken a pause. The leadership at Netcore have been interacting with us regularly, ensuring that each and every one of us are motivated, driven and come out as stronger and better professionals.

Academic courses relevant to the project: PBM, Digital marketing, Consumer behaviour, Marketing research.

PS-II Station: Nippon Koei, Hyderabad

Faculty

Name: Naga V K Jasti

Student

Name: AMUDHA BARATHI M(2018H1300074P)

Student Write-up

Short summary of work done during PS-II: Chennai peripheral ring road project- Assisted in review of traffic analysis and pavement design.

Puducherry multi-level parking project- Assisted in on-street and off-street parking analysis.

Helped in bid document preparation and presentations for various projects.

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

Objectives of the project: Detailed design review of various civil and ITS components for Chennai peripheral ring road.

Major learning outcomes: Learnt about various types of traffic studies, analysis and also about pavement design.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: During my internship at Nippon Koei India, I gained a new sense of professionalism and a clear view of what it meant to be in the professional world. This experience has prepared me well for teamwork, conflict resolution, cooperation and other useful skills in the workplace. As an intern, I was given responsibilities that made me get more involved with the company's mission of "Make Things Happen and Get Things Done". I learnt how smoothly the team worked together by the contribution of each and every individual's experience to the team. I was very happy to interact with various National and International experts. The working ambience was exceptional and all

staff were very cordial, friendly and were ready to help at times of need. Overall, my internship period at Nippon Koei India was a great learning experience.

Academic courses relevant to the project: Yes.

PS-II Station: Nomura - RMO - Risk Middle Office, Mumbai

Faculty

Name: Ambatipudi Vamsidhar

Student

Name: TATHAGAT SAXENA(2016A1PS0709P)

Student Write-up

Short summary of work done during PS-II: Worked in IB risk focusing on risk methodology. Worked on vertical clustering and power BI as projects apart from daily BAU's.

Tool used (Development tools - H/w, S/w : C++, Python, Excel VBA, Power BI.

Objectives of the project: Auto-validate rates based time-series in the database for anomalous occurrences.

Major learning outcomes: Learnt about ML and Multiple regression techniques. Importance and classification of risk evaluation techniques in the corporate setup.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The company and team provided a healthy environment, adapting to my learning pace and proving scope to broaden my learning curve.

Academic courses relevant to the project: Derivatives and risk management.

PS-II Station: Nomura Global Risk, Mumbai

Faculty

Name: Ambatipudi Vamsidhar

Student

Name: ISHAN RAI(2015B4AB0646H)

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): Python, VBA, PowerBI, Microsoft Excel.

Objectives of the project: Automate reports to be produced regularly, analyse and perform functions on large datasets through Python and VBA.

Major learning outcomes: Deeper understanding of Python, VBA and business intelligence software.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Decent work environment, helpful team members, work hours can be long.

Academic courses relevant to the project: Derivatives and risk management, Financial risk analytics and management.

PS-II Station: Novartis Healthcare Pvt. Ltd., Hyderabad

Faculty

Name: Bharathi R

Student

Name: DISHA ARORA(2018H1290010G)

Student Write-up

Short summary of work done during PS-II: Feasibility study of a drug is conducted prior to a project's undertaking such as a pharmaceutical and medical project. Principals of companies and their investors want to ensure that any given project they plan on developing is actually "feasible" and preparing a study showing this feasibility is the main point of writing such a report (which of course will help save needed capital and time in the long run). A feasibility study includes such vital information and data as the funding needs to complete the project, the market opportunity, government regulations, risk factors, strength and weaknesses, the management team and the financials of the company. While a feasibility study somewhat sounds like a business plan, such reports tend to be many times longer with more details on the market and financials.

Tool used (Development tools - H/w, S/w): SQL, R studio.

Objectives of the project: ROLE OF FEASIBILITY ANALYSIS OF A DRUG USING REAL WORLD DATA IN DRUG DEVELOPMENT.

Major learning outcomes: • Health care databases training.

- Understanding the secondary data from different EHR databases .
- Connection between two programming platforms.
- Programming on SQL & R platforms.
- Visualization of the results using R programming.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working hours are fixed for interns i.e 9 am to 5 pm. Colleagues and manager were very helpful in the entire learning process.

Expectations from Interns:

- Proficient in basic programming
- Statistics
- Quick learners
- Willing to learn

Expectations from company:

- Detailed and well-planned Trainings
- Good learning environment
- Exposure to various activities
- Great amenities
- Good food

Academic courses relevant to the project: Bio-statistics & bio-modelling, Research practice work, Study in advanced topics.

PS-II Station: Nutanix Technologies India Pvt. Ltd., Bangalore

Faculty

Name: Chandra Shekar R K

Student

Name: SARTHAK MOORJANI(2015A7B40104G)

Student Write-up

Short summary of work done during PS-II: The objective of the internship was to understand the disaster recovery and backup offering by Nutanix and contribute in the development for the

same. A kafka architecture for centralized logging was also developed. The major task was to scale up the current recovery plan from migration of 200 VMs to migration of 1000 VMs. The main task was to write remote procedure calls from a service to another in an attempt to optimize the workflow. Another mini project in the internship was to consume data from an internal health service and populate results corresponding to the entities of the service. This part of the project was done in Scala which was a completely new language to learn.

Tool used (Development tools - H/w, S/w): Python, Scala, Fudge framework, Postman, Zeppelin notebook, AWS Lambda, Kafka.

Objectives of the project: The objective of the internship was to understand the disaster recovery and backup offering by Nutanix and contribute in the development for the same. A kafka architecture for centralized logging was also developed.

Major learning outcomes: Python, Scala, Fudge framework, Postman, Zeppelin notebook, AWS Lambda, Kafka. Collaboration with teams in the US was also a good experience. The team members were very helpful and encouraging throughout the course of the internship.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment was good. I received abundant help from my team-mates as well as others in the organization. The company works in a sprint model. So, tasks were assigned for 2-3 weeks at once, and a review meeting was held at a weekly basis to update the status of the tasks. The expectations were little high because of the startup culture that is still there in the company. All facilities were provided by the company.

Academic courses relevant to the project: Data structures and algorithms, Operating systems, Computer architecture, Database systems.

Name: MAYANK(2015B2A70759H)

Student Write-up

Short summary of work done during PS-II: I'd been working with the Cloud Application and Lifecycle Management (CALM) team since the last semester, and the work was in continuation with what I'd been doing since the last semester - adding features - Jenkins integration, request ID tracking, log collection, etc to a relatively new repo.

Tool used (Development tools - H/w, S/w): Python, Flask, Golang, REST, OpenAPI, Jenkins, Shell scripting, Git, PostgreSQL, ZooKeeper.

Objectives of the project: Adding functional support and features to policy-engine services.

Major learning outcomes: Worked with various open source tools, learned certain industry conventions regarding coding, designing APIs. The biggest outcome was learning how to work remotely, away from the office environment - which everyone in the team was quite used to.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: My team can be easily counted amongst the ones with the best work environment here, be it the co-workers, manager or the quantity of work. Regarding expectations from the company - Nutanix treats its interns as employees and initially, there may be some difficulty in adjusting to the work. It helps if you've done courses like networks and software engineering.

Academic courses relevant to the project: Computer networks, Operating systems, Software engineering, Data structures and Algorithms, Database systems.

Name: MRIGANKSHI KAPOOR(2015B3A70616P)

Student Write-up

Short summary of work done during PS-II: The project involved development of robust algorithms that examine access logs for cloud storage resources and flag anomalous usage patterns / activities. This was done for two storage resources, AWS S3 and Nutanix object store. The kind of data, that was available in S3 logs and was generated by writing scripts to simulate user behaviour for NX logs, allowed two kinds of analyses to be performed. One to see any abnormalities in the overall usage pattern of the bucket and second to see if each user is deviating from its usual behaviour. Some rule-based filters were applied on top of these two modules to deal with false positives.

Tool used (Development tools - H/w, S/w): Python, Notebook, Docker, Proprietary tools (Nutest, Object Store).

Objectives of the project: The objective of the project is to examine access logs for cloud storage resources (S3, Nutanix Object Store) and develop models that can flag anomalous usage patterns / activities.

Major learning outcomes: Internal tools, Remote collaboration, Product Development Life Cycle.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Flexible work hours, brand new office, great benefits. Projects are offered in a wide range of domains (Networking, Machine learning, OS, to name a few).

Academic courses relevant to the project: Machine learning, NNFL, Econometrics, Operating systems.

Name: Prithvi Raj Nair(2016A7PS0013P)

Student Write-up

Short summary of work done during PS-II: Development tasks on sizer team (SaaS division).

Tool used (Development tools - H/w, S/w): MacBook Pro (H/W), Java, MySQL, Python, IntelliJ, Git etc. (S/W).

Objectives of the project: Sizer is continuously evolving software used by company sales executives to accurately find hardware configurations for a cluster based on customer requirements. Objective of this project is to contribute to the improvements, bug fixes and updates of the work.

Major learning outcomes:

- > Exposure to enterprise level code.
- > Experience with new technologies, frameworks and techniques.
- > Practical application of OOP, DBMS, Cloud computing concepts learnt in college.
- > Greater understanding of software development process and software industry.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work environment is kind of tough in sizer team. The team has two week sprints and it gets a bit hectic to finish all your assigned tasks in that one week. It takes a good 9-10 hours a day + some work during the weekends to get everything done on time. But it is a good learning experience, team members and senior managers are very knowledgeable and guide you effectively. The office is also very nice with good facilities.

Academic courses relevant to the project: Cloud computing, OOP, DBMS.

Name: ABHISHEK PANDEY(2016A7PS0081H)

Student Write-up

Short summary of work done during PS-II: Worked with Django REST in Python to develop some APIs to allow interaction with underlying applications like Conductor, Druid or the DAO layer of databases.

Tool used (Development tools - H/w, S/w): Python, Java, Conductor, Django REST.

Objectives of the project: To allow team to have more user friendly APIs for their codes to utilise

Major learning outcomes: Working with tight deadlines.

Incorporating changes to problem statement as they come and still not extending deadlines.

Object oriented designing.

Working with databases and evaluating performances of various approaches.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is pretty informal. We have flexible timings and are encouraged to work in a manner we deem fit for ourself. It is expected that one would be punctual enough for meetings and will seek help instead of getting stuck on some bug for long time.

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

Name: [BAJAJ KUNAL ASHWANI\(2016A7PS0092G\)](#)

Student Write-up

Short summary of work done during PS-II: Automation of backup of databases meant to trigger a container which will take periodic backup of current mongo and consul databases and upload it to AWS. Also, I created a user interface for AGS (Access Grant System) from scratch,

which users use if they want to access a particular VM in system. This UI lists current requests of the user which an owner of VM can approve / reject.

Tool used (Development tools - H/w, S/w): Docker, Python flask, Mongo, Shell, Python, Hashicorp vault and consul, AWS Boto3 library.

Objectives of the project: Automation of backup of databases and creation of UI for a service.

Major Learning Outcomes: Building a UI from scratch even deciding which language to use to build it.

Using dockers and containers.

Using Boto3 library of AWS.

Deployment using CI\CD technique.

Writing scalable and quality code.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Easily adaptable environment, flexible login and logout time, friendly and helpful environment.

Academic courses relevant to the project: Operating systems, Database management system, Data structure.

PS-II Station: Nvidia - Software, Pune

Faculty

Name: Vijayalakshmi Anand

Student

Name: AROORI CHANDRAHAS NARAYANA(2016A7PS0100H)

Student Write-up

Short Summary of work done during PS-II: Automated report generator built in Python.

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

Objectives of the project: To be able to automate various mundane tasks.

Major Learning Outcomes: Python and Openpyxl.

Details of Papers/patents: Worked with Python.

Brief Description of working environment, expectations from the company: Working environment was alright.

Academic courses relevant to the project: Object oriented programming.

Name: KUMAR ABHISHEK(2018H1030182G)

Student Write-up

Short summary of work done during PS-II: The work involved to build a profiler tool for the team which analyses the bottlenecks in the deepstream pipeline. The work was to develop frontend where user can upload the files and view dashboard. As a part of backend, scripts were developed using python. All the frontend requests are passed to the backend server (node express server). The server invokes the required Python scripts to upload the data in the respective tables. The database used is influx DB, which is a time series database (NO-SQL). Grafana is used to build dashboard. User is given drop down menu options on the dashboard to filter out the data as per the requirement.

Tool used (Development tools - H/w, S/w): ReactJS, Node express, Python, Grafana, Influx DB.

Objectives of the project: Visualize the bottlenecks in the deepstream pipeline.

Major learning outcomes: Full stack development. End to end knowledge of the data flow i.e from source file generation to the dashboard.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Company expects to do the assigned work with least help and perfection. Apart from this, the candidate should be a team player. The work environment here is very good as manager and seniors appreciate the work done.

Academic courses relevant to the project: Cloud computing, C/C++, DBMS.

Name: A Siddhartha(2018H1400137G)

Student Write-up

Short summary of work done during PS-II: Updating coloring schemes for Spans

? Initially all spans were colored using correlation id and graph id.

? Now all kernels with same name are colored with same color and also we have single color for all memcopy and memset.

? Also categorized Run-time and Driver based APIs into different types and assigned a color based on the type to which they belong.

Why to update the coloring scheme?

? Correlation Id is a sequentially incrementing number given to each CUDA API executed in a process.

? The coloring did not give any significant information apart from just separating adjacent activities.

Show GPU ranges for NVTX for easy correlation to kernel.

- Initially our tool used to show NVTX ranges of CPU.

- Using list of correlation ids corresponding to run time apis and driver apis, I found corresponding start and end times with respect to GPU by using map between those apis and kernels.

- Now it can show both GPU and CPU ranges for NVTX.

Why do we need NVTX GPU ranges?

- Highlight feature was used to correlate the NVTX CPU range to corresponding kernels and memcopy launched on GPU.
- The issue was that CPU range can be far apart from the GPU activities to see in the same view.
- Converting CPU ranges to GPU range enables easy correlation of NVTX ranges with GPU activities.

String table optimizations

Initially, the tooltips for all spans were having lot of information which was using lot of memory. Now, these spans data would be stored into array of structures which would be decoded in javascript plugin which would be assigned according to type of span.

Encoding part is done in utility which is in native c++ code these structures are exported to java script plugin which would decode each field of information into respective span field hence reducing the memory usage.

Tool used (Development tools - H/w, S/w): Visual studio code.

Objectives of the project: Updating coloring schemes for spans, Show GPU ranges for nvtx for easy correlation to kernel, string table optimizations.

Major learning outcomes: C, C++, JavaScript, Data structures and algorithms.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Work environment was very good. My team was very supportive, they regularly asked me about how I was feeling. During lockdown also they used to follow up regularly about my work, even they used to ask whether the work which they were giving me was Interesting or not. They are very friendly and very helpful they would give me demos of things which I had problem with. All in all, it was a wonderful experience where I learned a lot of things.

Academic courses relevant to the project: Programming, Algorithms and data structures.

PS-II Station: Nvidia Graphics - Hardware, Bangalore

Faculty

Name: Brajabandhu Mishra

Brief write-up on each PS-II station: 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 Bengaluru (both Hardware and Software divisions). Followings are the details regarding the nature of the work and the expectations from the interns in both Hardware and Software divisions of NVIDIA 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 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, Python and Tcl/Tk. 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 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: VINAYAK AWASTHI(2013HD400658P)

Student Write-up

Short summary of work done during PS-II: The work had began with reading up upon the Nvidia proprietary context switch unit internal architecture documents and the testbench design and verification specification documents to get the overall idea of the context switching unit, its different functionalities and features implemented.

Further many debug tasks related to functional safety and non-safety test failures were performed. These tests are written to verify the different functionalities of the context switching unit and the various safety features implemented to make it industry functional safety standard compliant. A bug / error is caught when running regressions of such tests on the main unit (DUT – Device under Test), in our case the Context switch unit. There were many types of debugs that were performed. In many cases the error was found to be in the tests (test not correctly anticipating the behavior of the DUT under certain conditions). In numerous cases, the debug process resulted in corrections in the design of the microcode. Sometimes, a bug may also be found at the RTL code level in which case appropriate changes need to be made in the RTL code. The extensive debugging process also lead to more and more clarity of the unit and its basic functionalities. Continuous study of the internal architecture and verification specification documents in parallel aided the learning process.

Other than debugging tasks, many coverage tasks were also completed. As per requirements for functional safety, its important that our testbench covers all the sections of the DUT, i.e all possible scenarios are hit. This ensures every line of the DUT code is hit at-least once to ensure there are NO blind spots in the DUT design. The same testcases written for functional verification can also be modified to include scenarios to hit boundary cases that may not get HIT in the normal course of the GPU / unit's operation. Separate directed test sequences were created to hit corner cases. A cumulative report gets generated in the end which gives a comprehensive evaluation of line as well as conditional code coverage. It marks the section of DUT code which were not hit by the tests. In which case, a further analysis needs to be done, as to why / what lead to this. And an appropriate stimulus or a checker needs to be added to Hit the missed cases. Many times, a MISS may occur due to some corner case inside a loop which never gets hit. Such cases are solved by implementing a checker in test to hit that case by specifically sending a particular argument to that code snippet.

Finally, a lot of experience was gained while working upon these tasks while at the same time enjoying it due to the detective like nature of the work. Finding out bugs, solving them and at the same time meet deadlines to contribute to the team working towards a common goal was very exciting as well as enlightening.

Tool used (Development tools - H/w, S/w): Verdi wave viewer, Perforce version management system, NVBUGS bug tracking system.

Objectives of the project: To achieve functional safety compliance of the context switching unit of Nvidia GPUs for automotive applications.

Major learning outcomes: Functional verification and testing methodology. Debugging process.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: It was a very healthy and conducive working environment. People here are very helpful and supportive of our own expectations from the internship. The company expects us to be inquisitive and good at communicating. Of course they want us to get things done but they also value learning. One can finish the job given very easily by asking around. Everyone is very helpful in that regard. But they are not looking for that. They want us to learn and understand what we are doing and why we are doing things in a particular way. Why not some other way? What are the possible alternatives to what we are planning to do. One should be able to answer these questions when asked. They value those who can prove to become self sufficient and independent while working in sync with the team.

Academic courses relevant to the project: Computer architecture, Digital design, Operating systems, Memory systems.

Name: AKSHIT DEEP SINGH(2015B1A30652P)

Student Write-up

Short summary of work done during PS-II: The project involved working on the Front End unit of the CPU architecture. The main task was to pin-point to the failure module with all the relevant information, thereby ensuring faster closure of the bugs. The primary area of focus was

understanding the test bench architecture of Core / Front End unit. The Front End unit comprised of three major blocks – the Instruction Fetch Unit (IFU), the Branch Prediction Unit (BPU) and the Decoder. Apart from covering these blocks, the project also dealt with the Out Of Order (OOO) execution. Debugging the failures provided the company with a time-efficient and cost-effective method to avoid post-tapeout bug issues in the RTL design logic.

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

Objectives of the project: The objective was to verify the RTL design logic which was being implemented.

Major learning outcomes: Learnt about computer architecture in great depth, particularly the Branch Prediction Unit.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment of the company was very good. The employees were very helpful. I could easily approach anyone for clearing my doubts. Moreover, the on-boarding process also went smoothly.

Academic courses relevant to the project: Digital design, Analog and digital VLSI design, Computer architecture.

Name: KULEEN JAIN(2015B1AA0819H)

Student Write-up

Short summary of work done during PS-II: Developed test bench infrastructure for verification of security checks of untranslated client requests and to create testbench for verification of client programmable aperture.

Tool used (Development tools - H/w, S/w): Gvim editor, Verdi, UVM, System verilog.

Objectives of the project: Verification of security aspects in memory fabric.

Major learning outcomes: Trustzone architecture, Virtualization, UVM RAL model, Debugging techniques and approaches.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment has been very professional. The team allotted to me was very helpful and encouraged me to ask doubts and explore various concepts and tools throughout. One can expect to work in live projects with best in class resources. The work given directly contributes to the leading technologies being developed by the company.

Academic courses relevant to the project: Operating systems, Microprocessors, ADVD.

Name: SHANTANU UPADHYAYA(2015B3AA0907H)

Student Write-up

Short summary of work done during PS-II: The primary task in the project is to debug various functional bugs like assert, hang, call stack, compute crc involved with the Nvidia latest chips using knowledge of Verilog, Microprocessors and Interfacing as well as Computer architecture. The work is primarily based on Verdi debugging and understanding the design code in Verilog. Another task was to write context switch buffer script in order to ease manual debugging time. Apart from that one more task was xprop test bringup.

Tool used (Development tools - H/w, S/w): Verdi, Verilog, ASM, Python, Perforce, Jupyter Notebooks.

Objectives of the project: Debug various functional bugs present in nvidia latest chips. Develop ctxsw buffer python scripts to ease manual debugging time.

Major learning outcomes: Debug various functional bugs using Verdi and knowledge of Verilog, Microprocessors and Interfacing, Computer architecture. Learnt Python from scratch and implemented powerful scripts for context switch buffer. Team-work and how to break down a complex problem into smaller chunks.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The work environment is great. Team-members are very helpful and there is a collaborative atmosphere. Flexi-timings, free lunch, cabs from office to your location, 14 day initial hotel accomodation. Expectations from the company: Self-starter, teamwork, ability to learn quickly and adapt to the conditions, hard-worker, strong grasp in computer architecture and digital design concepts.

Academic courses relevant to the project: Computer architecture, Digital design, Microprocessors and interfacing.

Name: ADITYA SUNIL VENIKAR(2015B5A30724P)

Student Write-up

Short summary of work done during PS-II: Project deals with familiarizing with the industry standard PCIe, its general understanding of transfer of different types of packets, familiarizing with the DUT and understanding of different layers in PCIe. It also involves the tracking functional and code coverage of the design and debugging of errors and verifying their fixes using Verdi. X-propagation and Gate level simulations were enabled in design for further verification.

Tool used (Development tools - H/w, S/w): UVM Verdi Synopsys.

Objectives of the project: Design verification of PCIe protocol. Debug assistance and functional coverage analysis.

Major learning outcomes: Good exposure to working environment of industry. Learnt industry standard tools and software for design verification purpose. Improvement in soft skills.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The environment facilitates quick learning and it helps to get to a solution of any problem that you face. Every one is easily approachable and the cross department talks help to gain a comprehensive overall view of the industry. The company expects a proactive approach from employees in order to learn more to contribute more to the project at hand, this may be in the form of participating in discussions or asking questions to develop one's skill.

Academic courses relevant to the project: Digital design, Microprocessors, Computer architecture.

Name: GUPTA ADITYA AJAY(2016A3PS0132P)

Student Write-up

Short summary of work done during PS-II: During the PS2 significant work was done on analyzing functional coverage of the test bench and adding new tests. Also significant work was done towards debugging daily regression failures which has contributed to deeper knowledge of the working of the DUT. Various literature and configuration files were read to get familiarized with the functionality of the DUT for debugging failures. Tests for verifying various functionalities like the Intra core snoops, tests stressing some specific address hazard cases and tests hitting the MMIO address space were added.

Tool used (Development tools - H/w, S/w): System Verilog, UVM, Verdi.

Objectives of the project: Analyze coverage reports for different interfaces and help in improving stimulus. Help in debugging different signatures in daily regression failures. Add tests in the test bench to improve stimulus.

Major Learning Outcomes: • Understood SV and UVM testbench structures.

- Gained coding experience in SV/UVM.
- Gained familiarity with general debugging techniques like waves (Verdi).
- Gained knowledge of the architecture of caches (L1, L2 and L3) being implemented in the industry along with all the techniques to improve hit ratio, miss path latency and other performance metrics.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment was really encouraging and people were really supportive. Any doubts were explained in details and a bigger picture of the work we were doing was provided. All mentors, managers and employees were really approachable and enthusiastic in helping me out with any issue I had during work or with understanding anything.

Academic courses relevant to the project: Computer architecture, Digital design.

Name: ABHISHEK S B(2016A3PS0147P)

Student Write-up

Short summary of work done during PS-II: Worked on functional Model - C++ model of the unit used to compare with RTL runs.

Wrote code to implement some new features.

Added tests to testlists & added coverage checks.

Also did some tasks related to performance measurement.

Misc tasks -fixing config files, code cleanup.

Tool used (Development tools - H/w, S/w): C++ , Version control (Perforce), Nvidia internal tools.

Objectives of the project: To update the functional model of the unit with upcoming features.

Major learning outcomes: Computer architecture, Cache, Coverage techniques, Performance analysis tools and techniques , C++.

Details of papers / patents: None.

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

1. Implement some of the upcoming features in functional model code.
2. Write testlists, Add coverage checks to make sure intent of tests are met.
3. Misc tasks - like code cleanup, fix config files.

Working environment:

1. Was a part of HSHUB-Arch team.
2. Manager and mentors were very helpful.

Academic courses relevant to the project: Computer architecture.

Name: ASHWIN PODUVAL(2016A3PS0237P)

Student Write-up

Short summary of work done during PS-II: It involved studying changes in specifications which were going to be made in a new chip. Some part of the work involved helping out with the implementation of these changes, while the major part involved verifying that design changes made matched the functionality that the architects had in mind.

Tool used (Development tools - H/w, S/w): Perforce, Synopsys Verdi, Nvidia proprietary tools.

Objectives of the project: Migration & Verification of changes related to NVIDIA's NVLink interconnect.

Major learning outcomes: This internship basically gave me an idea of the tools used and approach followed in ASIC verification. My internship helped me understand (and experience) what goes in the day to day life on verification engineers in industry, which I believe is one of the main goals of PS 2 - that we get industrial exposure and understand the approach and work culture of the host organisation.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The company has a very open working environment. People are very approachable, friendly and discussions are often quite informal. The company has employee friendly policies. Expectations for the majority of the internship were laid out at the beginning of the project, but some of the later expectations were kept dynamic to account for changes in plans / schedules.

Academic courses relevant to the project: Computer architecture, Digital design. While I never took OOP, I think it would have helped if I had taken it earlier. A lot of code that I had to understand was written in C++ & System Verilog and knowledge of object oriented programming concepts would help.

Name: CHAPPIDI SAI REVANTH REDDY(2016A3PS0286H)

Student Write-up

Short summary of work done during PS-II: I worked in Tegra memory sub system architecture team. I developed infrastructure tools in Python which include generating DRAM channel signal plots from RTL run - file dumps, parsing register specifications of chips. These tools are used by the team for debug, analysis, create func / perf model tests. Though, most of the work is done in Python, needed to work on couple of architecture verification models (for a few initial days) in C++.

Tool used (Development tools - H/w, S/w): Python, C++, Unix shell scripting , Perforce.

Objectives of the project: Designing tools in python (arch team uses these tools for DRAM channel debug / analysis).

Major Learning Outcomes: Computer architecture (Memory Sub System - Cache, Paging, Virtual Mem ..etc), Operating systems, Python, Unix.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The company offers flexible work hours. And an intern is not any less equivalent to an engineer or manager in proposing ideas or taking up responsibilities or tasks and things are flexible to an intern's learning curve. Also, an intern can learn a lot during the projects.

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

Name: RAJAT KUMAR BEHERA(2016A3PS0291H)

Student Write-up

Short summary of work done during PS-II: Design, verify and bring up of memory controller for FPGA.

Unit Level (Memory)

- Take the original RTL file
- Understand the new spec
- Code parametrized memory RTL with new spec
- Code Testbench
- Simulation
- Bit-stream flow
- Bringup in lab

- Documentation and checkin

System Level (CPU)

- Integrating the new RTL with ccplex
- Simulation
- Snapshot
- Bitstream flow
- Bringup in Lab

Tool used (Development tools - H/w, S/w): VCS, Verdi, Vivado, Protocompiler.

Objectives of the project: Run simulations tests on FPGA (Hardware) to speed up the process.

Major learning outcomes: Simulation, Bitstream flow, Lab bringup, Synthesizable, Parametrization design, Debugging skills.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment of NVIDIA is very good and employee friendly, and it is known for its awesome work culture. Everyone is approachable and you should never hesitate to clear your queries. You are expected to follow the timeline and finish up the tasks which are assigned by your mentor / manager. There will be weekly team meetings and sync up meetings with mentor / manager to guide, help and review the work done by you.

Academic courses relevant to the project: FPGA, DD, Comparch.

Name: VISHAL SINGH(2016A3PS0852H)

Student Write-up

Short summary of work done during PS-II: Successfully completed formal verification of 10 basic submodules of LDPC. Found bugs in 3 of these modules. Also, wrote basic script in PERL to automate some of the redundant steps in formal verification flow. The other contribution includes understanding RDC flow by running unit level RDC checks and then waiving the acceptable violation by adding required waiver file in the flow. Also, ramped up on different protocol specification and developed Plugin for protocol conversion that can be used to instantiate corresponding Verilog code for required flavor.

Tool used (Development tools - H/w, S/w): JasperGold (Cadence) and Meridian (Real Intent).

Objectives of the project: Formal verification of LDPC modules and Plugin development for protocol conversion.

Major learning outcomes: Formal verification, ASIC flow, Reset domain crossing, Different protocol specification.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Finish work as per the timeline. Mentors are quite supportive.

Academic courses relevant to the project: Digital design and FPGA lab.

Name: ANOUSHKA SARASWAT(2016A8PS0227P)

Student Write-up

Short summary of work done during PS-II: • Worked in system performance verification team.

• Responsible for implementing and debugging tools for performance and latency breakdown of transactions flowing in the memory controller pipeline of complex SoC with multi-channel DRAM controller.

- Implemented Kibana dashboard by creating visualisations of key performance indicators of system performance verification using ElasticSearch.
- Enhanced framework for launching / monitoring regression.
- Skills acquired: Waveform debugging capabilities in Verdi.
- Languages used: Python, Perl, Shell scripting.

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

Objectives of the project: Improve performance at system level of complex SoC.

Major learning outcomes: Architecture and working of memory subsystem.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Work culture is extremely great. Everyone is very approachable. Manager and mentor are really supportive. They'll expect you to be consistent with your work.

Academic courses relevant to the project: Computer architecture, Operating systems.

Name: SAURABH P JAIN(2016A8PS0316P)

Student Write-up

Short summary of work done during PS-II: As part of the GPU performance verification team, I was involved in firstly familiarizing myself with GPU architecture. Then, I learnt about the tools (Nvidia Internal) my team used to run tests / simulations on GPU Chips. I was tasked with running a testlist called "Key performance vectors" on the turing architecture which involved PERL de-bugging. I also did some scripting work in Python to auto-generate a product config file which the team uses, saving them manual effort, since it was done manually till then. Apart from the above, I also did some scripting work to post testlist results onto a visualization tool like

KIBANA (Open source) so that, trends across architectures could be easily plotted and understood.

Tool used (Development tools - H/w, S/w): KIBANA, PERL, Python, Nvidia internal software, Perforce.

Objectives of the project: 1) To write a script to auto-generate the product config file. 2) Post testlist results to make meaningful plots on KIBANA. 3) Run tests on turing architecture.

Major learning outcomes: Programming practices in PERL and Python were improved. Understood version control. Learned about GPU architecture and graphics. Learnt about the platforms Nvidia uses to run tests on different chips.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Nvidia has a very professional yet very friendly work environment. My team was extremely welcoming and helped me in even the most basic doubts I had. My manager was very understanding yet very critical which helped me know which areas I have to improve on. The HR is incredibly supportive. The timings are very relaxed and no one asks you to be on time If you have finished your tasks. Amazing place to work!!

Academic courses relevant to the project: Computer architecture, Digital design and Computer programming.

Name: PINTO KEVIN ANTHONY(2016A8PS0337P)

Student Write-up

Short summary of work done during PS-II: My work majorly dealt with creating appropriate FIFO sizes in order to store the information packets that are sent by the receiver to the sender who are using the valid-credit interface protocol in order to communicate with one another. The

sender and receiver were various sub-units in the Nvidia proprietary memory sub-system. The size of the FIFO's generated had to be tailored to the particular configuration that the respective module was in.

Tool used (Development tools - H/w, S/w): Perl, Linux Kernel and MS-Excel.

Objectives of the project: To create appropriate FIFO sizes based on the configurations of the memory sub-system modules.

Major learning outcomes: FIFO sizing and valid-credit interface protocol.

Details of papers / patents: No specific papers or patents were referred for my work.

Brief description of working environment, expectations from the company: This company has the best working environment I have seen till date. Every member in my team was incredibly knowledgeable and super-helpful both in regard to teaching me concepts related to my work as well as clarifying any doubts that I would encounter in the course of my work. In addition to teaching me a new programming language my internship has made me more confident in programming as well as strengthened my foundations in computer architecture as well as microprocessor design.

Academic courses relevant to the project: Computer architecture, Microprocessors and interfacing and Digital design.

Name: PINTO KEVIN ANTHONY(2016A8PS0337P)

Student Write-up

Short summary of work done during PS-II: The project involved writing a Perl script that takes an excel sheet as an input and produces an output .spec file as well as an output excel sheet.

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

Objectives of the project The objective of the project was to use the valid-credit interface protocol to generate tailored FIFO sizes.

Major learning outcomes: Valid-credit interface protocol, Scheduling algorithms and GPU memory sub-systems.

Details of papers / patents: No papers or patents were referred.

Brief description of working environment, expectations from the company: The company had an incredibly supportive and helpful work environment. The team members were always ready to answer any of my conceptual doubts as well as help me whenever I got stuck during the course of my project.

Academic courses relevant to the project: Computer architecture, Microprocessors and interfacing, Digital design.

Name: AMOGH B S(2016A8PS0397H)

Student Write-up

Short summary of work done during PS-II: The initial part of the internship involved the generation of System Verilog (SV) code in the testbench to test the functioning of the RTL GPU Arbitrar unit. Memory Arbitrar is a platform of multiple arbitrans which facilitate the communication of different intellectual properties (IPs) with the memory. The project involved the generation of the port mapping and packet information which are the basis for interaction between these IPs. It also involved the generation of SV codes for the instantiation of these IPs. The later part of the project involved the generation of a UVM Register Abstraction Layer Model for the register blocks in Memory Arbitrar. It involved interfacing the model with the blocks through the Privileged Register Interface (Nvidia proprietary) and generation of tests to verify the design registers in the Arbitrar.

Tool used (Development tools - H/w, S/w): Perforce, Perl, System Verilog.

Objectives of the project: System Verilog Code Generation and RAL Model Integration for GPU Arbitrar Unit Testbench

Major learning outcomes: I learned a plethora of skills including languages like Perl, System Verilog, technologies like Perforce, Linux and methodology namely Universal Verification Methodology (UVM). I was also exposed to the working practices and structure of a team.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Nvidia is a very amicable workplace and provides a nurturing enviroment to grow and stand out as a hardware intern. Peers are friendly and help out at each turn, teaching and guiding when necessary. The comany expects the work to be done at a reasonable pace and is flexible on the timing and hours put into the work, as long as the work is completed.

Academic courses relevant to the project : Computer architecute, Digital design.

Name: NIKHIL GOYAL(2016A8PS0416G)

Student Write-up

Short summary of work done during PS-II: Verification of Level 3 cache system in CPU.

Tool used (Development tools - H/w, S/w): Verdi, UVM, System verilog.

Objectives of the project: Verification of Level 3 cache system in CPU.

Major learning outcomes: Baics of complete verification methodology.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is the best. You get free lunch and snacks. Good communication within the company.

Academic courses relevant to the project: DD, CompArch, Basic verilog will be helpful.

Name: MYTHILI K(2016AAPS0152H)

Student Write-up

Short summary of work done during PS-II: The project was related to CPU design, particularly related to debug module. I was involved in designing multiplexers, FIFOs, synchronizers, planning layout of debug bus stations, instantiation of logic analyzers etc.

Tool used (Development tools - H/w, S/w): Perl, Verilog, Shell Scripting.

Objectives of the project: Designing of debug module.

Major learning outcomes: Learnt in-depth Perl and Verilog, gained exposure to CPU Design.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment was very friendly and cooperative. The managers and mentors were always willing to guide. The company expects interns to be proficient in coding and have basic knowledge of Computer architecture and Digital design.

Academic courses relevant to the project: Computer architecture, Digital design.

Name: MYTHILI K(2016AAPS0152H)

Student Write-up

Short summary of work done during PS-II: The Central Processing Unit is one of the most important parts of a computer. Each CPU contains a debug module to help in debugging a chip and thus, the debug module is an integral part of the design process. This project deals with CPU and debug module design and about the intricate process and factors involved in designing. It involved addition of control registers, multiplexers, FIFOs, debug buses and logic analyzers.

Tool used (Development tools - H/w, S/w): Verilog, Perl, Shell scripting, Perforce.

Objectives of the project: Designing debug architecture for CPU.

Major learning outcomes: The debug module is an integral part of the CPU in order to ensure its proper functioning. It is important to design it such a way that it has access to all parts of the CPU, at the same time, not occupying too much chip area or consuming excess power. Thus, it is a challenging task and a great learning opportunity for an intern. I learnt how to design keeping in mind different sub-units and chip area, power dissipation and already existing wiring information. This internship gave me an opportunity to learn shell and Perl scripting. Last but not the least, the skill of coordinating with various team members and getting inputs was a valuable learning from this internship.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The company expects us to know Verilog and basics of processor design. The environment is friendly and instructive.

Academic courses relevant to the project: Digital design, C programming, Computer architecture.

Name: Faruki Asifali Arifali(2018H1230154G)

Student Write-up

Short summary of work done during PS-II : Work involves writing tests for memory group, try to rectify and come up with clean test, run it on RTL and see whether test intent is met or not. Tests are written to check for memory consistency and coherency which is very crucial in multi-processor system. Work is mostly related to computer architecture concepts. It touches cache basics and protocols to maintain a multi-processor system.

Tool used (Development tools - H/w, S/w): Verdi and other company specific tools.

Objectives of the project: Writing tests to fully accomodate all aspects of cache.

Major learning outcomes: Multi-processor system basics.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Maintaining cache coherency and consistency is real challenge in multiprocessor system. Work included cache related issues in detail. In addition to this, coverage improvement was another part of the project. Coverage improvement of 7-8% was achieved. Debugging failing tests is really a great way to learn about the verification environment. Work had reflections on it. Knowledge of system verilog and other verification specific concepts are needed everywhere in the industry, which was greatly covered in project specifics.

Academic courses relevant to the project: Computer architecture.

Name: Vallully Maxwin Davis Annamma(2018H1230159G)

Student Write-up

Short Summary of work done during PS-II: Enhancing the testbench used to verify PCIE block. This involved coding of checkers, assertions and scripts to automate tasks.

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

Objectives of the project: To make enhancements to the existing UVM testbench by coding assertions, checkers and writing scripts to automate tasks.

Major learning outcomes: UVM, PCIE specifications.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment was very warm and inspiring. The people around were welcoming and helpful.

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

Name: Yugesh P K(2018H1230170G)

Student Write-up

Short summary of work done during PS-II: Worked with Performance Verification team for NVIDIA GPUs memory subsystem. First task was to improve the methods involved in extraction of performance metrics (like latency, bandwidth, L2 hit / miss ratio) of NVIDIA GPU memory system. It involved writing Python / Shell scripts to extract and compute these metrics from signal dumps, rather than display messages in log. Finally, create temporal plots of these metrics using Bokeh plots.

Second task was to modify the existing RTL testbench of GPU memory system by increasing count of instances of certain components of memory system like GPU cluster, Frame buffer partitions. Then, implement connectivity changes around these new instances and build the testbench and debug errors during the build. Once the testbench is built, run performance verification tests and verify and compare results after and before testbench changes.

Tool used (Development tools - H/w, S/w): NVIDIA Proprietary Verilog Language, Python, VIM, Synopsys Verdi.

Objectives of the project: RTL Testbench Modification & Performance Verification of Memory Subsystem of NVIDIA GPUs.

Major learning outcomes: - Working of memory architecture designs of NVIDIA GPUs

- Learnt usage of Perforce, basics of LINUX OS.
- Python coding with Linux commands.
- Learnt usage of NVIDIA proprietary specification and verilog language.
- Usage of VERDI for debugging signal dumps and RTL flow.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The company has a very professional yet cool working environment. The teammates and manager are always ready to help, be it if they are of same team or another. The company even though established still has a start up nature. They expect us to solve problems and research as much as ourselves, before clearing up with other teammates. The tasks assigned were also challenging and helped gain lot of knowledge.

Academic courses relevant to the project: Computer architecture, VLSI design.

Name: PRADEEP SINGH(2018H1240085H)

Student Write-up

Short summary of work done during PS-II: In this Internship, I was working with the verification team, so my work was related to module verification. I learned system Verilog and UVM concept in ramp-up period and after that I started working on the project. To use Nvidia platform Linux command also necessary so I learned some important Linux command. In my project, there were two modules which I have to verify using System Verilog and UVM

methodology. In this project, most crucial thing which are many numbers of the register in the modules so, I used UVM register blocks. Before making UVM testbench, I have to understand the features of the different modules and different scenarios which are used to verify the particular functionality means testplan should prepare before moving to the testbench. Accordingly, UVM TB also created to do verification.

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

Objectives of the project: To create UVM TB for PWM and TACH.

Major learning outcomes: System verilog and UVM basic concept.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is good. The company expectations will be high.

Academic courses relevant to the project: VLSI design.

PS-II Station: Nvidia Graphics -Software, Bangalore

Faculty

Name: Brajabandhu Mishra

Brief write-up on each PS-II station: 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 Bengaluru (both Hardware and Software divisions).

The software division of NVIDIA Graphics, Bengaluru deals with architecture, design, development and verification work related to the software solutions for automotive based on NVIDIA chips. The work requires expertise in C & C++ programming, Operating system, Linux internals, Build systems, Computer graphics and multimedia, Compiler technology, Machine

learning and Deep learning. 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, Python etc. Knowledge of computer architecture is also essential. Knowledge of good coding practices, adherence to associated standards and software engineering processes are necessary for building large and complex softwares like the ones this team develops. Moreover, enthusiasm to learn, faster ramp-up, proactiveness, a positive attitude are must have qualities required for the industry.

Student

Name: CHARU JAIN(2015B1A30825P)

Student Write-up

Short summary of work done during PS-II: I mainly worked on NVGrok, a code search tool used by Nvidia employees. It consisted of various small tasks mostly involving developing work in JAVA. First task was the migration of NVGrok to a newer version of OpenGrok, the open source tool used by NVGrok internally. The next task was to add a case sensitive search feature in the application which involved thorough study of Elastic search concepts, inverted index, Indexing and searching mechanism. Also, the change in the searching and indexing performance was to be considered while finding the solution. The whole process was thoroughly documented for future use. Next task was to create a database and then to create a web application for the NVGrok team, including the UI and host it on tomcat. Authentication was also added to the application to secure the usage.

Tool used (Development tools - H/w, S/w): Java, Unix, Perforce, HTML.

Objectives of the project: Migration of NVGrok, the code search tool in NVIDIA to a newer version and addition of user specific features to NVGrok.

Major learning outcomes: 1. Learnt about Java web development fundamentals - JDBC servlets and JSPs.
2. Gained in-depth knowledge about the workings of a search engine.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is very good and friendly. The seniors are very helpful and supportive. The timings are flexible and very convenient to balance work and social life. The work in my team was mainly development work and required good knowledge of Java.

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

Name: SALIL JAIN(2015B5A30578G)

Student Write-up

Short summary of work done during PS-II: Used coverity tool to do static analysis in the codebase and generate HTML reports using the results returned by coverity. The project involved writing the main script in Python then using HTML, CSS and JS for the generated reports. After this, the aim was to solve violations in the codebase. This involved reading team's code (in C) and making changes to it.

Tool used (Development tools - H/w, S/w): Coverity, Python, HTML, CSS, JS, Shell scripting.

Objectives of the project: To create a different report to show the effect by user's code changes. Decrease the number of code violations in the codebase.

Major learning outcomes: Developed skills in HTML, CSS, JS and Python.

Details of papers / patents: NA.

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

Academic courses relevant to the project: CP.

Name: SHUBHAM AGRAWAL(2016A8PS0350G)

Student Write-up

Short summary of work done during PS-II: Compute Trace Library (CTL) is a C++ framework that was developed to generate compute traces. Traces are the communication that happens between a given application and the GPU, required for the application to get its task done. This project is to Metric Collection Framework (Profiler) for CTL which will record API use, number of times an API is called, arguments and data with which an API is called. After that, data is recorded, it should be reported in proper format and user should be able to query it or visualize it.

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

Objectives of the project: Implement Metric Collection Framework.

Major learning outcomes: Learned about coding in C++ and various things related to technology.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Excellent friendly work environment. Helpful colleagues. Flexibility in work.

Academic courses relevant to the project: Computer programming.

Name: AMAN BHALA(2016A8PS0366G)

Student Write-up

Short summary of work done during PS-II: My work was mainly related to adding functionalities to the tools used by Golden Register (GR) team so that verification of Tegra SOC (Self driving Car SOC of Nvidia) can be done more effectively along with helping the team to migrate to newer database and also helped them with Importing values of Orin chip (Nvidia's new chip) into the GR database so that, Orin chip verification can also be done in future. Alongside, I also did some testing during the release phase generating csv's and helping with solving mismatches. Moreover, I also helped in improving performance of the tool by reducing the memory footprint.

Tool used (Development tools - H/w, S/w): Linux terminal, Python, Git, VDK (Virtual Development Kit) / FPGA, C language.

Objectives of the project: To improve functionality in the team's tools, migration to GR2.0 and Orin import work.

Major learning outcomes: Python, Scripting, Software development, Design, Testing, Verification.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: It was a great learning experience for me. Team members and my mentor were really helpful in solving my queries. Documentation was also there for tools which helped me get through them easily. Other than that NVIDIA also provides lunch, snacks and office cab so, there was no problem relating to those aspects. There would be regular team meetings where you are supposed to tell your progress and finish your work within deadline. Interested students can apply for this PS station but there is one thing that there are lot of different teams working on different things and managers pick students by looking at their resume that you would be uploading on PSMS so make sure your resume is updated.

Academic courses relevant to the project: DSA, Microprocessors and interfacing.

Name: Prakhar Shukla(2018H1030058G)

Student Write-up

Short summary of work done during PS-II: Developed a prototype rule engine (NVrule) for Nvidia system management (NVSM). The rule engine was developed from scratch. A Web-UI was also developed for submitting the rules and editing JSON data on which the rules execute. I also searched for already established work that can be modified and used in NVrule and found out many compatibility issues with them.

Tool used (Development tools - H/w, S/w): ANTLR4, Golang, Unix, Web development tools, Compiler design tools, Docker, Gitlab.

Objectives of the project: To develop a prototype rule engine for Nvidia system management (NVSM).

Major learning outcomes: Developing your own language from scratch, practical aspects of compiler design, Parse tree to abstract syntax tree conversion, working with project versions on gitlab, understanding architecture of big projects like nvidia system management.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment in Nvidia, Bangalore is amazing. There is no office timings and one can come and go as he / she pleases. The lunch and snacks are free. Every intern is provided with VPN access so that he can work from home. Every intern is treated as an employee. The level of work assigned is tough (at least in my team) and the expectation of the organization from the interns is high. You're provided with a maxed out laptop and you can ask for additional monitors and desktop if you need them.

Academic courses relevant to the project: Yes, courses like compiler design and cloud computing were relevant.

PS-II Station: NXP India Pvt. Ltd., Bangalore

Faculty

Name: Satya Sudhakar Yedlapalli

Student

Name: ANAGHA MOHAN(2018H1400176P)

Student Write-up

Short summary of work done during PS-II: Worked on setting up different industrial standard power estimation tools and estimated a correlation between RTL and Gate level power.

Tool used (Development tools - H/w, S/w): ANSYS PowerArtist, Cadence Joules.

Objectives of the project: To find the power correlation between RTL and Gate level.

Major learning outcomes: Learned about different industrial standard power estimation tools, their setup and how the tools calculate the RTL and Gate level power.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment was very good and everyone was very friendly and helpful. They were always ready to clear my doubts and help with my project however they can. The company gives you all the opportunity to learn in every way you can.

Academic courses relevant to the project: VLSI design.

Name: ROHITH KRISHNAN P(2018H1400180P)

Student Write-up

Short summary of work done during PS-II: Power estimation and Static timing analysis.

Tool used (Development tools - H/w, S/w): Cadence Joules, Voltus, Ansys PowerArtist, Cadence Tempus.

Objectives of the project: 1. Power estimation of the design and its analysis 2. Benchmarking the NXP internal tool against other EDA tools.

Major learning outcomes: 1. In-depth knowledge about the tools used for power estimation and STA.

2. Factors contributing to the power consumption of the design and its reduction.

3. Understanding the design flow and the requirements and deliverables at each stage.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The work environment is good. The company might give some generic project during the internship for the purpose of evaluation from the college, since they are concerned about the confidentiality of the designs. Once that project is over (or sometimes in parallel), the design specific tasks will be allotted, if you are already received the placement offer.

Academic courses relevant to the project: VLSI design, Advanced VLSI design, VLSI architecture.

PS-II Station: NXP Semiconductors, Noida

Faculty

Name: Rajesh Kumar Tiwary

Student

Name: HOSUR NIKHIL BABURAO SHIVKANTA(2018H1230230P)

Student Write-up

Short summary of work done during PS-II: I have been assigned physical design department which is also one of the backend profiles in VLSI industry. I have learnt the VLSI design flow conceptually and applied that to one of the projects / blocks assigned to me. The steps involve synthesizing the RTL, floorplanning, placement and routing (PNR) and then clock tree synthesis (CTS). I have used Design Compiler (DC) for synthesis and then IC Compiler 2 (ICC2) for rest of the steps. Both of the tools are provided by Synopsys. Also, the whole flow has been automated by Lynx design flow which executed the scripts for performing the above tasks such as synthesis, PNR and CTS to avoid huge manual work. It is also easy to use.

Tool used (Development tools - H/w, S/w): Software: RedHat Linux operating system | Hardware: Design Compiler (DC), IC Compiler 2 (ICC2) by Synopsys.

Objectives of the project: Learning and understanding logic synthesis, floorplanning and APR flow.

Major learning outcomes: Learnt about the steps present in backend engineering of VLSI SoC design.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment is good.

Academic courses relevant to the project: CAD for IC design, VLSI design.

Name: PRINCE KUMAR MAHATO(2018H1230233P)

Student Write-up

Short summary of work done during PS-II: Short Overview of the work done during this period: Part of VLSI physical design team (Backend Team) -Involved in running in the entire GDS II flow from synthesis to sign-off. The table summarizes the entire flow done during this period. All these steps are performed on the RTL from the Frontend team.

S.No	Steps	Tools used	Summary
1.	Synthesis	Design compiler	Generation of gate_level netlist
2.	Design planning	ICC 2	Floor-planning and other physical cell placement
3.	Placement	ICC2	Standard cell placement
4.	CTS	ICC2	Synthesis of clock network
5.	Routing	ICC2	Route the Design
6.	Sign-off	PrimeTime	Checking timing and other design related constraints

*LEC Conformal (Cadence) Logic Equivalence Checking at different stages.

All these tools were incorporated in a LYNX environment. In addition to these, I was assigned various task force team to carry out work on that stage,

1. Placement team 2. PT sign-off team

Also, I had to undergo various training and labs to learn the entire flow and present some presentation on various topics.

Tool used (Development tools - H/w, S/w): SYNOPSYS TOOLS: Design compiler, IC compiler II, PrimeTime.

CADENCE TOOLS: Conformal.

Objectives of the project: As an intern, the main objective was to ramp up for the future projects and get deep insight into the work.

Major learning outcomes: Mainly learnt about the physical design flows (Back-end) in detail.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Everything you need in an working environment is available. Teams and all the authorities are quite professional, friendly and co-operating. The company expects you to understand your work flows and to develop a deep understanding and learn to apply your skills and learning to carry out projects and help them in developing new technologies and ideas.

Academic courses relevant to the project: The academic courses VLSI design, CAD for IC design, VLSI architecture will help you in your work.

Name: PRANAV BALDUA(2018H1230239P)

Student Write-up

Short summary of work done during PS-II: In the starting of the internship, a study project was assigned on 2 partitions of the SoC, so as to understand the flow flush of backend and how to work on different tool, and debug the error. After the study project, a partition was assigned on which we have to start from synthesis and complete till signoff. Along with study of different topics related to backend like EM analysis, dynamic vs static analysis, LVS, different types of libraries etc.

Tool used (Development tools - H/w, S/w): Design compiler (synopsys), ICC2 (synopsys), conformal (cadence).

Objectives of the project: Understanding of the physical design flow.

Major Learning Outcomes: Synthesis (design compiler), floor planning, placement, CTS, routing (ICC2), Logic equivalence checking (Conformal).

Details of Papers/patents: None.

Brief Description of working environment, expectations from the company: Helpful seniors, flexible work environment, weekly sync up.

Academic courses relevant to the project: CAD for IC design.

Name: SWETA PRASAD(2018H1400168P)

Student Write-up

Short summary of work done during PS-II: Learnt Perl scripting. Working on live project and learnt about SoC architecture. Learnt the testbench architecture, various blocks present on the SoC, various buses present. Learnt how to write verification plan for various blocks. Learnt about coverage. Worked on various tools of Synopsis and Cadence. Also learnt about Power aware verification.

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

Vplanner-Cadence

Vmanager-Cadence

Xcelium-Cadence

IMC-Cadence

Objectives of the project: Going through the SoC architecture and all blocks. Writing verification plans for SoC verification.

Major learning outcomes: Learnt complete flow of SoC verification. Learnt about coverage flow. Used various Tools.

Details of papers / patents: Not Applicable.

Brief description of working environment, expectations from the company: We are provided all the support that we need. We are encouraged to do good work.

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

Name: ROHIT SHARMA(2018H1400186P)

Student Write-up

Short summary of work done during PS-II: I learnt Perl scripting and wrote many script to automate the verification flows. I also understand various bus interface protocol that is very important in SOC verification. I also learnt system verilog and UVM. I also understand 3 different blocks of SOC. I understood verification plan and test case of these blocks. I also understand debugging of the signals which is very important in verification of SOC.

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

Objectives of the project: SOC verification.

Major learning outcomes: Perl system verilog UVM.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: It was good.

Academic courses relevant to the project: Yes.

PS-II Station: OLX Group, Gurgaon

Faculty

Name: Ritu Arora

Student

Name: TUSHAR GOEL(2016A7PS0023P)

Student Write-up

Short summary of work done during PS-II: AutoSuggest is a feature in which an application predicts / suggests the user's next word(s). Specific to OLX, this feature helps the user to search for items by suggesting relevant and abundant results. This report includes proposed solutions, their results and comparison with the legacy algorithm and these should be intent aware, relevant and sensitive to abundance. These solutions will help the user to find relevant results and reduce the number of null searches.

Tool used (Development tools - H/w, S/w): Solr, Kafka, Dropwizard.

Objectives of the project: To improve user's search experience.

Major learning outcomes: Learnt about the practical usage of the information retrieval techniques in the corporate world and how to solve real world problems directly affecting the user.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: OLX was a great place to work, probably the best till now. All the team members were very helpful and encouraging. The managers gave me opportunities to work on projects which were directly affecting the users and showed confidence in our abilities. The mentors were always there to motivate us and guide us through out the period of this internship. There were enough opportunities for learning while also not overloading us with work and maintaining work life balance.

Academic courses relevant to the project: Information retrieval.

Name: SRINKHALA(2016AAPS0219H)

Student Write-up

Short summary of work done during PS-II: Worked on implementing new features in the existing OLX progressive web app based on the product requirements for a better user experience.

Tool used (Development tools - H/w, S/w): VS code, Gitlab.

Objectives of the project: The projects were aimed at improving user's experience by revamping the existing features or adding new features to the progressive web application.

Major learning outcomes: Learnt about progressive Web Apps, React, Redux, Node, Express, CI/CD, YAML, Git.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The team was very helpful. There were a lot of opportunities to learn new concepts and also apply them in our work. The work which was assigned to me focused on the training and development of my skills.

Academic courses relevant to the project: The course on Object oriented programming concepts was helpful.

PS-II Station: Oswal Industries, Mehsana

Faculty

Name: Samir Kale

Student

Name: Patil Kunal Mahendra(2018H1410079G)

Student Write-up

Short summary of work done during PS-II: We studied the different types of valves such as gate valves, check valve, trunnion mounted ball valve and globe valve. We also learned about the different standards according to which the design package for the valves is created such as API, ASME and ISO. We also learned how to create design packages for different types of valves.

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

Objectives of the project: To create design package for different types of valves.

Major learning outcomes: Thorough study of valves.

Details of papers / patents: We referred to different standards such as API 6D, ASME section 8, ASME B16.34.

Brief description of working environment, expectations from the company: The staff at OSWAL is very supportive but the working environment is very rigid and hectic. This is due to the audits that take place frequently in the company.

Academic courses relevant to the project: Strength of materials.

PS-II Station: Oyo Rooms (Tech), Bangalore

Faculty

Name: Lucy J. Gudino

Student

Name: SAPTARSHI BHATTACHARJEE(2016A3PS0201P)

Student Write-up

Short summary of work done during PS-II: Work was mostly related in web development. We had to work in both frontend and backend as required by the organisation. Work included fixing bugs and creating new features for their website.

Tool used (Development tools - H/w, S/w): PHP, HTML, CSS, JAVA, JAVASCRIPT, SPRING WEBFLUX, SPRING BOOT.

Objectives of the project: Cater to the organisations's needs.

Major learning outcomes: Web development.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Work environment was very good. The employees were very helpful whenever needed. The managers were accomodating and helped whenever needed. Overall, it was a good learning experience for a new web developer.

Academic courses relevant to the project: Data structures and algorithms.

Name: PRASHANT SHANKAR(2016A8PS0445G)

Student Write-up

Short summary of work done during PS-II: I was part of the website team in Belvilla. So, my work included fixing production bugs and working on developing new features for the website.

Tool used (Development tools - H/w, S/w): jQuery, Twig, PHP.

Objectives of the project: To work as a full-stack developer.

Major learning outcomes: Handled large code bases, got exposure to full-stack tech stack.

Details of Papers/patents: NA.

Brief Description of working environment, expectations from the company: Everyone was friendly and working environment was good . Although due to frequent firings, team kept changing . Also , the tech stack in use currently in Belvilla(part of Oyo vacation homes) is very old . They have thought to upgrade it but the process keeps getting stalled again and again.

Academic courses relevant to the project: NA.

Name: PAPPU VENKATA ROHIT(2016A8PS0874H)

Student Write-up

Short summary of work done during PS-II: I worked on three main projects. The first project involved developing an in-house map service for OYO. The second project involved migrating an Invoicing Microservice from PHP to Java. The third project was designing a Mock Ordering Microservice using CRUD principles, based on RESt API functionality. There were other miscellaneous tasks like verification of Emails, written in javascript and creating APIs to facilitate communication between two different platforms.

Tool used (Development tools - H/w, S/w): Java, PHP, Javascript, React, MySQL, PGSQL, Postman, OSM.

Objectives of the project: To rewrite a microservice to make it scalable.

Major learning outcomes: Learnt the various concepts of Software engineering and implemented OOPs and DBMS concepts.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The office was a co-working space. There were no fixed timings or dress code. The company expected you to

finish your assignment within a specific deadline. The deadlines were flexible. The manager and the mentors give excellent feedback and guide the mentee well.

Academic courses relevant to the project: OOPS, DBMS, Software engineering.

PS-II Station: OYO Rooms, Hyderabad

Faculty

Name: Chennupati Rakesh Prasanna

Student

Name: UTSAV KAUSHIK(2016A3PS0272H)

Student Write-up

Short summary of work done during PS-II: Communication team handles all the client networking at OYO, they run many services such as ACP-notifications, communication-SMS, e-mail, clockwork etc. Clockwork is a scheduler service that is used by various other teams to schedule tasks and get deliveries using kafka. All the tasks are pushed to the kafka queue or stored in a database, then they are delivered to the respective topics at the scheduled time and the delivery is continuously being listened to by the kafka listener at other services. Logs from all the running services can be visualized on kibana from the ElasticSearch data, which is used to monitor the anomalies in logs, and if any occurs an alert is sent to dedicated slack channels using the ElastAlert system. Apart from that, there are other services like ACP-notification which is responsible for sending push / pull notifications. This service also uses clockwork to schedule the notifications. A very large tech stack is used to implement all these services, the most common ones are Spring MVC, Java, MongoDB, DynamoDB, Thrift and Maven. While for monitoring, Kibana and Graffana are used and there are some internal services running to scrape some useful data.

Tool used (Development tools - H/w, S/w): Java, IntelliJ, Spring MVC, MongoDB, DynamoDB, Ruby, ElasticSearch, Kibana, Maven.

Objectives of the project: Task scheduler & Clockwork integration and other assigned projects.

Major learning outcomes: The major learnings of doing these projects was to understand the development of highly scalable softwares and web-applications with ease and how services interact with each other in a large ecosystem such as OYO.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: Working environment at OYO is really friendly, people are willing to help you if you want to learn new things or understand the existing system. Managers don't put you under too much workload. On calls might be hectic but overall a good learning experience.

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

Name: [UTSAV KAUSHIK\(2016A3PS0272H\)](#)

Student Write-up

Short summary of work done during PS-II: Communication team handles all the client networking at OYO, they run many services such as ACP-notifications, Communication-SMS, e-mail, clockwork etc. Clockwork is a scheduler service that is used by various other teams to schedule tasks and get deliveries using kafka. All the tasks are pushed to the kafka queue or stored in a database, then they are delivered to the respective topics at the scheduled time and the delivery is continuously being listened to by the kafka listener at other services. Logs from all the running services can be visualized on kibana from the ElasticSearch data, which is used to monitor the anomalies in logs, and if any occurs an alert is sent to dedicated slack channels using the ElastAlert system. Apart from that, there are other services like ACP-notification which is responsible for sending push / pull notifications. This service also uses clockwork to schedule the notifications. A very large tech stack is used to implement all these services, the most

common ones are Spring MVC, Java, MongoDB, DynamoDB, Thrift and Maven. While for monitoring, Kibana and Grafana are used and there are some internal services running to scrape some useful data.

Tool used (Development tools - H/w, S/w): Java, IntelliJ, Spring MVC, MongoDB, DynamoDB, Ruby, ElasticSearch, Kibana, Maven.

Objectives of the project: Task scheduler & clockwork integration and other assigned projects.

Major learning outcomes: The major learnings of doing these projects was to understand the development of highly scalable softwares and web-applications with ease and how services interact with each other in a large ecosystem such as OYO.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: Working environment at OYO is really friendly, people are willing to help you if you want to learn new things or understand the existing system. Managers don't put you under too much workload. On calls might be hectic but overall a good learning experience.

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

Name: GARGI GUPTA(2016A3PS0288H)

Student Write-up

Short summary of work done during PS-II: In the beginning, I was assigned a project to develop a library for structured logging and logtracing. Apart from that, I was given different tasks in many ongoing projects like communication API related changes, SSO login authentication and minor bug fixes.

Tool used (Development tools - H/w, S/w): Spring Boot, Django, PostgreSQL, MongoDB Compass, Apache Thrift, REST.

Objectives of the project: 1. Library for generating logs in structured format and to trace the journey of a request across a stack of microservices. 2.To use kafka for microservices communication 3. To enable sending of whatsapp, SMS and e-mails according to the new template.

Major learning outcomes: I was involved in many different projects, so got to work with a lot of people in my team. I was given a lot of critical tasks with strict deadlines, which made me learn how to work under pressure. Learned how to use theoretical knowledge to production level tasks.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment is great, you get to learn a lot as there are new projects coming on a frequent basis. Flexible work hours. Everyone is friendly and helping.

Academic courses relevant to the project: OOP, DBMS.

PS-II Station: OYO Rooms, Hyderabad

Faculty

Name: Chennupati Rakesh Prasanna

Student

Name: ABHANI KEYUR BHARATBHAI(2016A3PS0297H)

Student Write-up

Short summary of work done during PS-II: 1. I have worked on analytics project where we have to capture all user activity on web pages like clicks on particular links, typing on search-box etc. Here, I have used Google Tag Manager to define Tags and Trigger which will capture all user activity and stores it in the DB. Now from DB, I have written a service which will take data and pass to the Logstash server using Kafka and from Logstash server, we will pass the data to Kibana dashboard to visualise data more effectively.

2. Worked on security issues to prevent all hacking activities on to the websites.

3. Worked on many business booster tasks which were assigned to me by my engineering manager.

Tool used (Development tools - H/w, S/w): Spring-boot, Django, Elastic search, Kafka, Postgres, Reactjs.

Objectives of the project: I have worked on analytics project and main objective of project was to understand behaviour of users which are coming to website and by observing it satisfy demands for them.

Major learning outcomes: Learn Spring framework, Django framework, Elastic search, Kafka, ReactJs etc.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: It was very good experience for me to work with OYO as SDE Intern. I have learnt lot of new things from my mentor, engineering manager and all other people from my team. Everyone in my team was very friendly and very supportive when I used to asked them.

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

Name: YASH CHOKHANI(2016A3PS0393H)

Student Write-up

Short summary of work done during PS-II: Developed a framework which helped to keep a check on each of the service of HMSFOM, which when pushed to the main repository runs the build and checks the percentage of the service covered in unit test so that the build never fails and there are no fall-backs of the changes. The framework used the CircleCi which is a third party application but runs the test cases which are developed in Java using Mockito and JUnit framework. These tests ignore the external API and DB calls and just test the logic. The integration tests then calls the DB and the API which checks their health and then if everything passes it gives a green signal to merge. Developed the feature of making bulk guest cards for a manager of every hotel and allowing to select multiple guests and see if any information is missing. Developed a feature which makes the guests when they are checked in directly from the app and then maps it's id to the team's database. Integrated the fault tolerant to the slack channel and added the hystrix time out for each and every API so that we get the alert for a certain threshold after any API fails.

Tool used (Development tools - H/w, S/w): Springboot, Elasticsearch, Kafka, System design, AWS, Kubernetes, MongoDB, Grafana, Postman, AWS buckets, PostgreSQL, React-Native, Android studio, CircleCI, Sonarqube, JUnit, Mockito.

Objectives of the project: Creating guests even if they do check-in from the app before. Creating an API which enables bulk guest card printing. Creating a Kafka event whenever an event reminder is added by a guest. Adding the unit test cases for multiple services and CircleCi.

Major learning outcomes: Full stack development which I don't think would have been possible anywhere else.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is very good. As a fresher you won't ever feel like you don't know stuff. People are always ready to help you out even for the smallest of things. You'll get a lot of exposure when it

comes to development. Will be given opportunity to work on new projects as well and even making decisions on low level design.

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

Name: PRIYANKA WALIA(2018H1030107H)

Student Write-up

Short summary of work done during PS-II: During the first month, I learnt OYO's tech stack and built a small bootcamp project. The project used technologies namely, springboot for backend, React JS for front end and Mongoddb as a database was used. In the remaining duration of internship, worked mostly on front end development of internal OYO applications. A part of a task was on Ruby on Rails as well. Other tasks include, consuming APIs and building fast and smooth frontend and several other UI changes.

Tool used (Development tools - H/w, S/w): IDE-Visual studio Code, RubyMine, Node js, React js, Postman, Ruby on Rails.

Objectives of the project: To get learning of OYO's tech stack and deliver an efficient UI experience for consumers.

Major learning outcomes: Quality coding, knowledge of React-Redux, API integration, Ruby on rails basics.

Details of papers / patents: No papers / patents.

Brief description of working environment, expectations from the company: OYO tech stack possesses a good variety and quality of technologies. Working on these applications helps a lot in learning the latest technologies with quality code writing . The team members and other employees are very supportive and helpful. It helps in development of an individual both professionally as well as personally. This overall creates a great work environment.

Academic courses relevant to the project: Yes.

Name: SAIFUR RAHMAN(2018H1030122H)

Student Write-up

Short summary of work done during PS-II: We joined the Weddingz team at a time when it was having a major upgrade of its tech architecture from monolith to a microservices based one. Built Search Engine Optimization microservice for OYO's Weddingz team using Spring Boot in backend and React in the frontend. Learnt Prometheus and ELK for monitoring health and logs. I also worked briefly in Django. Exposure to how large scale applications are built and maintained, the tools used for debugging and monitoring was of immense importance.

Tool used (Development tools - H/w, S/w): Spring Boot, Apache Thrift, Django, DBeaver, MAMP, Rundeck, Kubernetes, Jenkins, JIRA, Prometheus, Grafana, ELK.

Objectives of the project: Full stack development.

Major learning outcomes: Writing good code, Object oriented design, software development.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Amicable work environment. Expectations are high. Ownership and proactiveness is expected. Hyderabad office is functional; expect nothing more. Learning opportunity is huge.

Academic courses relevant to the project: Object oriented design. Distributed data systems.

PS-II Station: OYO Tech, Gurgaon

Faculty

Name: Ashish Narang

Student

Name: BAGUL ISHAN MAHENDRA(2015B1A80740G)

Student Write-up

Short summary of work done during PS-II: The work assigned to me during the internship was completely on back end web development using MVC architecture principles. All the projects were real business projects, either development of new features on the OYO tech stack or creating maintenance mechanisms for the same. We mainly handled two languages: Ruby and Java for development. My first project was creating an inter-app channel between two applications of OYO meant for property managers in order to raise repair and maintenance tickets for their hotels and get approval for the same. The second project, I was involved in was to create monitoring and retry mechanisms for the vital availability and price flows from OYO to various partners like Booking com, Airbnb, Expedia where we list our properties too for sale.

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

Objectives of the project: To create inter-app channels for OYO applications.

Major learning outcomes: Got a lot of hands on experience on industry grade application development as well as practices.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Great work environment, comfortable timings, no deadline pressures and interesting work. A great place to learn.

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

Name: PRATIK KUMBHARE(2015B1A80746G)

Student Write-up

Short summary of work done during PS-II: The main focus of the project was to create a system for console free month end reconciliation process. Being part of the Recon India team, we were responsible for creating the system only for India. There are 43000+ hotels alone in India under OYO, this requires quite a stable and robust system with large amount of resources for calculation of the recons. And if there is any issue with any of the recons then it used to take a console access to make necessary modifications and check the issue at hand. The projects task was to develop necessary tools (front end and back-end) for carrying out all the month-end reconciliation activities without console access along with systems integrated for trouble shooting.

Tool used (Development tools - H/w, S/w): Ruby on Rails, AWS, NewRelic, Grafana, Sidekiq, Sentry, Kibana, RubyMine, Kafka, PostgreSQL, Postman.

Objectives of the project: To create additional necessary functionalities for console free month-end reconciliation.

Major learning outcomes: Learnt programming and writing production level code in industrial environment along with integration of various monitoring tools for the web servers.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: OYO hosts a open space working environment along with necessary arrangements for breaks in between work. The mentors and staff are very supportive and provide with great learning opportunities. The company expects a performance at par with other experienced developers so there are always challenges we are expected to overcome, but also provides necessary support when required. In terms of learning opportunities, OYO might have higher potential than other companies as the work here is much more on an average. Overall, OYO has a good working environment and presents great learning in industry level software development.

Academic courses relevant to the project: OOP.

Name: TAPISH TEWATIA(2015B2A30778G)

Student Write-up

Short summary of work done during PS-II: Android development project in the consumer Android App particularly relating to Booking and Post Booking.

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

Objectives of the project: Enhance the UI / UX of the consumer App.

Major learning outcomes: Android development skill, Github, team building.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Cooperative environment great for realising new goals.

Academic courses relevant to the project: OOP.

Name: KARTIK KUMAR(2015B3A80212G)

Student Write-up

Short summary of work done during PS-II: I was a part of operations technology team at OYO. I worked on multiple projects. One of them being related to the security of the systems built by the team where I learnt about how to protect systems from attacks like DDOS. Another

project was related to database migration which was for cost optimisation purposes. Got to work with microservices using REST and Thrift APIs and analysed the APIs for latency.

Tool used (Development tools - H/w, S/w): Java, Github, Spring Boot, React, Airflow, MongoDB, ElasticSearch, REST, Thrift.

Objectives of the project: To prevent systems from cyber security attacks. Also, cost optimization.

Major learning outcomes: Knowledge of multiple security attacks and working with multiple databases.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Work is a bit more than other similar in OYO. But without a doubt, one of the best places for a fresher software developer to start his / her career. Easy to get a PPO in normal circumstances.

Academic courses relevant to the project: Object oriented programming, Data structures and algorithms, Computer network.

PS-II Station: PAYPAL, Bangalore

Faculty

Name: Uma Maheswari N

Student

Name: SAMKSHA BHARDWAJ(2015B2A70859P)

Student Write-up

Short summary of work done during PS-II: The main project consisted of building a custom landing page for an internal analytics tool, Herald. This involved adding an API to the backend to fetch details about the users and integrate this with the frontend which displayed information related to relevant components. Some additional work involved optimising Druid queries and using Elastic.

Tool used (Development tools - H/w, S/w): ReactJS, Java, SpringBoot, Maven.

Objectives of the project: Building a custom landing page.

Major learning outcomes: Familiarisation with a production work environment, expertise with front end.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Quite a helpful work environment. Deadlines are mostly flexible as long as the final project is delivered on time. Most people are approachable. Events happen on a weekly basis which help bring some levity in the workplace.

Academic courses relevant to the project: DSA, OOP.

Name: UJJWAL SAINI(2015B3A70607P)

Student Write-up

Short summary of work done during PS-II: My project was to work on an "Automated Release Tool" whose main focus, as a start, was to automate some of the data aggregation any engineer has to do for creating an email every time a new release is being done. This includes collecting information from Github, continuous integration tools for unit test coverage, functional test coverage platforms etc. After collecting the data, an e-mail should be sent out to all the release approvers from the tool, and it should wait for their response and correspondingly

update the state of the release. We had to create this tool from scratch using internal frameworks based on Spring and ReactJs. The database handling was done via Google cloud firestore.

Tool used (Development tools - H/w, S/w): Spring Boot, Reactjs.

Objectives of the project: Automate the release process for the payments team as a minimum viable product.

Major learning outcomes: Spring frame work, Java, ReactJs, MVC pattern, NoSQL databases.

Details of papers / patents: Automated Release Tool. A web-service for internal PayPal purposes.

Brief description of working environment, expectations from the company: The working environment is just like you would expect from a fortune 500 company, it is a highly employee centric company where the internal structures are quite flat and you can reach out for help from anyone. The co-workers and team mates are highly helpful and will be present there to guide you all throughout the way. The company just expects you to deliver on your targets. How and where you reach the targets is totally up to you, the HR also cares about the employees and is visible from their efforts.

Academic courses relevant to the project: Object oriented programming, Theory of computation, Data structures and algorithms, Database management system.

Name: RANADIVE SAHIL ASHISH(2016A7PS0097P)

Student Write-up

Short summary of work done during PS-II: Development of frontend and backend for viewing various types of transactions and their flows in the merchant billing team at PayPal in a consolidated webapp called billing admin.

Tool used (Development tools - H/w, S/w): Node, React, Redux, Java spring boot.

Objectives of the project: To bring to production level billing admin tool.

Major learning outcomes: Development tools like react and redux.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Horizontal flatout structure with extremely friendly managers. Very good work environment with good instruction and focus on developing talent.

Academic courses relevant to the project: None.

PS-II Station: PAYPAL, Chennai

Faculty

Name: Akshaya G

Student

Name: MORAVINENI BALA KRISHNA(2016AAPS0157H)

Student Write-up

Short summary of work done during PS-II: 1. Developed a webpage that consumes an external API and shows the information in a particular format and then convert it into a widget so that it can be imported into any existing project inside the company. This external API provides external data related to a customer and hence provides new insights into the case investigation. 2. Developed a web page that shows only the relevant information / features of a case / alert to an investigator according to the rule-feature mappings defined as part of the configurations. This helps the investigator make the decision of either to dismiss or report the given case faster and hence able to investigate more cases in lesser time.

Tool used (Development tools - H/w, S/w): React.js, Redux, React Hooks, Java, Spring framework, Node.js, REST API, GraphQL, C3.js charts, WordCloud.

Objectives of the project: 1. The Casefile application helps in the investigation of alerts / cases related to suspicious transactions / activities which may involve terrorism financing, money laundering or such activities. The objective of Smart Investigation Assistant (also called CI).

Major learning outcomes: Frontend development, backend development, understanding the domain of the team and various compliance related activities in a financial institution like generating cases / alerts, investigating them and reporting any suspicious activities found to Government regulatory agencies etc.,

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The work environment is very good. All the employees are very nice and friendly. They never ask you to work on a weekend even if you are an intern by which I mean to say the social life will be pretty good. No stress from mentors or managers. They highly encourage you to learn new things and at your own pace.

Academic courses relevant to the project: Object oriented programming, Database management systems.

PS-II Station: Pepper Content Pvt. Ltd., Mumbai

Faculty

Name: Anjani Srikanth Koka

Brief write-up on each PS-II station: The below mentioned are the expectations from the industry in common apart from some specific skills in a student. A student can be better prepared by practicing these skills.

1. Exposure to marketing and finance course fundamentals 2. Data analytics 3. Proficiency in Excel, python, R, SQL 4. Soft skills.

Student

Name: HIMANSHU GOYAL(2016A1PS0629P)

Student Write-up

Short summary of work done during PS-II: I was involved in two projects. In the first one, I re-designed the Standard Operation Process of the company, their databases and introduced automations in the processes to maximize operational efficiency and effectiveness of the system. In the second project, I was given an opportunity to conduct market research and suggest a new business vertical that the company can open under their operations to which I came up with the designing vertical. I was also asked to prepare a GTM strategy which even sharpened my business acumen.

Tool used (Development tools - H/w, S/w): Zapier for automations, Advance Excel, Zoho One (CRM tool).

Objectives of the project: To reduce the turn around time for deliveries by 50% by optimising the operation process.

Major learning outcomes: Database structing and operations when the scale of data in hundreds of thousand, automation using tools and extensions, overall business strategy.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The company is a growth stage startup, everyone is young, dynamic, full of energy. The idea is to get the job done. ANYHOW! obviously there were some days filled with monotonous tasks but overall the kind of learning curve the company put any associated individual is very steep. It promotes cross functional role and believes in offering career paths and not just a job role.

Academic courses relevant to the project: NA.

PS-II Station: Pfizer Ltd., Chennai

Faculty

Name: Bharathi R

Student

Name: WADEGAONKAR VAISHNAVI PRASAD(2018H1080293P)

Student Write-up

Short summary of work done during PS-II: I was allotted a project to study the current regulations controlling Off-label drug use. This involved studying the guidelines published by the regulatory authorities around the world related to the off-label indications. The project also included studying the practice of off-label drug prescriptions and the risk involved in it. The current market trends, regulations of off-label marketing and routes of filing an indication for the approved drug were some of the other areas of focus.

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

Objectives of the project: To study the perspective of regulatory authorities towards off-label drug use. To understand the regulatory requirements and the procedures for acquiring the approval for off-label indication. To study the perspective of pharmaceutical industry and HCPs.

Major learning outcomes: The project shed light on the lack of regulations in off-label drug use around the world.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The experience of working for a pharma giant like Pfizer was overwhelming. Pfizer is highly

organised system with efficiently managed hardworking employees. Every member of the organisation 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. It also gives an opportunity to observe the corporate culture and understand the need of leadership as well as efficient teamwork.

Academic courses relevant to the project: Yes, I had to apply knowledge of courses: Quality Assurance and Regulatory Affairs, Clinical Research, Pharmacology and Intellectual Property Rights.

Name: RAGHAV RATHI(2018H1460247H)

Student Write-up

Short summary of work done during PS-II: The project done is Transition of Medical Device Directive (MDD) to Medical Device Regulations (MDR): Key changes and impact on various delivery systems” in Europe. For this, I went through the official websites of EMA and various other EU websites, and tried to extract information. Regarding the key changes in the new regulation and how this regulation changes will impact the regulatory field and the market. And what requirements are necessary for the company point to be in line with the new regulations and how will this new regulations will impact the company portfolio.

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

Objectives of the project: Study focuses on regulatory changes in Medical Device Directive (MDD) to Medical Device Regulations (MDR) and key changes in it. To understand the key changes in MDR and to access the impact of its regulatory requirements on different medical devices.

Major learning outcomes: Various guidelines related to medical devices in different countries.

Technical documentation requirement for medical devices. Process of getting approval for medical device. Changes in the Medical Device Regulations in European Union. Impact of this changes on various stake holders of the company.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Good working environment with all necessary facilities, encouraging and helping colleagues. Company is expecting much on how much knowledge we gain rather than just completing a project. Heads of department spend time to review the final presentation and share their suggestions and advice. There is proper communication with other sites. Monthly knowledge sharing meetings based on regulatory topics. competitions and team building activities are also carried out. The organization had treated us like one among their employees. The organization's head, Mr. K S Babu (Head of Regulatory Affairs, India), a fellow BITSIAN, had been supportive throughout the duration of the project.

Academic courses relevant to the project: Quality Assurance and Regulatory Affairs, DFD.

Name: ADITI SISODIYA(2018H1460322P)

Student Write-up

Short summary of work done during PS-II: Explored biosimilars development and regulation. Differences between biologics and small molecules, regulatory pathways, Interchangeability of biosimilars in Australia, United states, Canada and Europe, ICH guidelines concerning biologics (Q5A, Q5B, Q5C, Q5D, Q5E), Post-approval change guidelines in Australia, United states, Europe, Canada and New Zealand.

Tool used (Development tools - H/w, S/w): None.

Objectives of the project: Life cycle management activities of Biologics.

Major learning outcomes: Post-approval changes and their submission procedures in AU, US, EU, Canada and NZ.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Pfizer has the bestest working culture ever. All the team leaders and employees are very much understanding and helpful. They always keep motivating their employees and are very supportive for extra-curricular activities. It feels like a whole family.

Academic courses relevant to the project: Quality Assurance and Regulatory Affairs (QARA), Clinical research (CR), Intellectual Property Rights (IPR).

Name: GAURI(2018H1460332P)

Student Write-up

Short summary of work done during PS-II: Worked on the project - Regulatory requirements for complex injectables. Basic concepts in regulatory from industrial point of view were understood in the process. Also, learned about different departments in regulatory and the work flow in the company. Participated in various competitions held in the office and learned various important corporate values.

Tool used (Development tools - H/w, S/w): No.

Objectives of the project: To understand the regulatory affairs professionals work and its contribution in health care.

Major learning outcomes: Regulatory affairs basics and also the contribution of regulatory affairs professionals was understood.

Details of papers / patents: No.

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

Academic courses relevant to the project: Yes.

PS-II Station: Piramal Group, Mumbai

Faculty

Name: Ankur Pachauri

Student

Name: PIYUSH JAIN(2016A3PS0885H)

Student Write-up

Short summary of work done during PS-II: My projects focused on various business segments of Piramal group including the Piramal foundation. My work was to provide extremely helpful insights by analyzing data and also help many other departments by automating and simplifying their business requirements.

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

Objectives of the project: To automate crucial business processes and also to provide helpful insights by analyzing massive data.

Major learning outcomes: Agile methodology, Business intelligence, Knowledge of retail finance, Risk & fraud detection analysis, Strategic business planning & execution.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The Piramal group is a diversified global business conglomerate based on the values of knowledge, action, care and impact. Philosophy of the group is “doing well and doing good”. Counting upon its values and philosophy, Piramal group provided a great environment for learning and personality development. Most of the mentors in my analytics team were BITSians and thus a friendly bond developed among us. Even the managers were very friendly and supportive. Most of my work included automation and risk analysis projects. Ample guidance was provided by the mentors as well as managers. I even got chances to improve my presentation and soft skills. Apart from technical knowledge, I was able to gain certain amount of business knowledge and understanding. Overall, my experience was great!

Academic courses relevant to the project: Artificial intelligence, Machine learning, Neural networks & Fuzzy logic.

Name: SHUBHANKIT SINGH(2016A7PS0864H)

Student Write-up

Short summary of work done during PS-II: There are 5 automation projects which I completed during the entire PS along with which I got to explore how chatbots work and how IBM Watson and other cloud bots work. I also got to learn how fuzzy string matching works and how image similarity is done through edit distance and similarity index. Along with this, I also got to learn about Tesseract which is Google’s OCR and also got to learn about openCV and its functions about erosion, dilation and gray scaling.

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

Objectives of the project: Increase efficiency and reduce human effort.

Major learning outcomes: Automation, NLP, OCR.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The company expected us to provide short term results to every day business problems either by automation already formulated reports or by bringing things like image processing for document analysis.

Academic courses relevant to the project: Machine learning.

PS-II Station: PricewaterhouseCoopers (PWC), Gurgaon

Faculty

Name: Gaurav Nagpal

Student

Name: SHRIKANT SHARMA(2018H1300089P)

Student Write-up

Short summary of work done during PS-II: Location advisory solution, PPP risk assessment framework, Concession agreements, COVID-19 impact on PPP, How to mitigate the several risks arising out of a prolonged force Majeure.

Tool used (Development tools - H/w, S/w): Secondary Research, MS-Office.

Objectives of the project : Mitigation of force Majeure risk in a PPP.

Major learning outcomes: Practices with respect to structuring PPP concession agreements, Location advisory practices for industries, Incentive structure of various state governments for industries.

Details of papers / patents: Confidential.

Brief description of working environment, expectations from the company: Healthy environment, keeps one busy with work. Plethora of opportunities in a diverse domain. COVID-19 lead to work from home, so active use of remote working.

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

PS-II Station: Qualcomm India Pvt Ltd- Bangalore, Bangalore

Faculty

Name: Rejesh N A

Student

Name: NARNINDI RAMANI(2018H1230203H)

Student Write-up

Short summary of work done during PS-II: I was assigned scripting tasks by methodology team. These scripts helped and sped up their analysis. First task was on SPEF parsing to help in delay analysis, second task was on netlist parsing which helped in STA.

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

Objectives of the project: To create scripts which make analysis easier and faster for physical design methodology team.

Major learning outcomes: Learnt about graph packages in python which help to represent data in a more readable format and got a better handle on some STA concepts.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The team I was assigned to (Physical design methodology team) was small, so I had more interaction with them. My manager and mentor were patient because I was an intern. I had more interaction with my mentor rather than my manager. They expect a basic foundation in a coding language. In my case, the tasks assigned to me were in Python. It is also good to be familiar with Linux environment. Having a grasp on STA concepts and an idea on physical design flow beyond what is taught in college courses would also help. This is specific to PD methodology team which I was assigned to. Other teams may have other requirements.

Academic courses relevant to the project: VLSI design, Advanced VLSI design.

Name: NARNINDI RAMANI(2018H1230203H)

Student Write-up

Short summary of work done during PS-II: Worked on PD Methodology team and wrote scripts to help design automation. One was on SPEF Parsing and the other script was to detect divergence points to help robustness check of clock tree.

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

Objectives of the project: To determine clock tree paths sensitive to datapath failure due to huge skew by measuring divergence of connected flops in a netlist.

Major learning outcomes: Learnt parsing various outputs generated in PD Flow. Learnt to use Python graph packages to assist in design analysis.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Company expects a basic foundation in any scripting language, familiarity with Linux environment and in the case of PD Methodology team, a basic idea on PD flow and STA.

Academic courses relevant to the project: VLSI design, Advanced VLSI design.

Name: APOORVA SHARMA(2018H1240086H)

Student Write-up

Short summary of work done during PS-II: I worked on memory controller verification. I was assigned tasks in the project I was working on where I worked on few debugs related to mode register read and exclusive access. I had to understand the whole flow of the verification for these features and debug. Also, worked on analysis of inconclusive assertions and I was asked to write a script to program more than 1000 registers. This script converted an xl file into a system verilog task. It also included additional features such as ignoring a particular register or overriding it or moving the register write in the beginning or at the end. Another script was written to compare the read values of register with the programmed values.

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

Objectives of the project: To understand various aspects of memory controller verification.

Major learning outcomes: Learnt what is verification and how debugs are done and had a very good exposure to different aspects of verification in a memory controller.

Details of papers / patents: NA.

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. They involved me in all the project activities and we had a daily meeting where in my tasks were assigned to me. They also had a presentation of what I have learnt during internship in my tasks. The company expects us to have a good basic knowledge and be a proactive person in learning.

Academic courses relevant to the project: VLSI design, Digital electronics.

Name: LIGADE RAJAT PRAVIN(2018H1240112P)

Student Write-up

Short summary of work done during PS-II: I got the opportunity to work in two different projects. First project was based on DDRSS memory controller design verification. In this, I worked on assertion coverage. Prerequisites: System Verilog and UVM. Before starting with project, I went through system verilog courses and UVM courses. The Universal Verification Methodology (UVM) is a standardized methodology for verifying integrated circuit designs. The UVM class library brings much automation to the SystemVerilog language such as sequences and data automation features (packing, copy, compare) etc., and unlike the previous methodologies developed independently by the simulator vendors, is an accellera standard with support from multiple vendors: Aldec, Cadence, Mentor Graphics and Synopsys.

In second project, I worked on power aware verification for DDRSS memory controller. PA is mainly based on Unified Power Format (UPF). Unified Power Format (UPF) is the popular name of the IEEE standard for specifying power intent in power optimization of electronic design automation. My main focus in this project was retaining CSR registers with their saved values after the power up of particular block. Perl scripting was also involved in this project to determine which registers are retainable and which are not.

Tool used (Development tools - H/w, S/w): Linux, Python, Perl, Synopsys verilog compiler, System Verilog, C.

Objectives of the project: To learn the functional and power verification of a memory controller.

Major learning outcomes: Learned different scripting languages like Perl and Python. Learned the verification flow of functional as well as power aware.

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. Qualcomm has a very good work culture. Lots of learning series are organised, for freshers to managers. Lots of entertaining extra curricular activities are arranged as well (even in WFH environment). The company expects you to have some basic knowledge about System Verilog, scripting skills and some bus protocols.

Academic courses relevant to the project: VLSI design.

Name: Megha Agarwal(2018H1400132G)

Student Write-up

Short summary of work done during PS-II: Establishing a fixed latency slave system which will be the replica of another system or a memory controller, particularly in terms of performance analysis / parameters. This system will be helpful as it will take less bring up time for any project and so will give more time for analysis. It will be highly beneficial as this setup will be less complex, will generate quick results and will be a very efficient tool to work / debug.

Tool used (Development tools - H/w, S/w): LinuxView, Verdi, Microsoft XL, Perl tool, Verilog, SystemVerilog.

Objectives of the project: Accurate graphics performance projection using an established model at pre-silicon stage.

Major learning outcomes: Perl tool, comparing two types of systems and improvising one of them using graphical approach, basic graphics system, triggering vectors to check graphical performance.

Details of papers / patents: Verification of AMBA AXI on-chip communication protocol, verification of memory transactions in AXI protocol using system verilog approach.

Brief description of working environment, expectations from the company: The working environment of the company is really really good, a balance is there between work and other fun

activities, teammates are great which makes it more comfortable will be expecting to learn as many things as possible as the company and its people have great knowledge and experience.

Academic courses relevant to the project: VLSI, Hardware software co-design, Embedded systems.

Name: NITIN CHAND M S(2018H1400171P)

Student Write-up

Short summary of work done during PS-II: I have been working in the power optimization of a design. The potential modules were identified where there is a scope for saving power. The RTL of these modules are modified in order to include the power optimization techniques. The whole design was checked for the lint and CDC violations. Then, the logical equivalence of the modified design is checked with the reference design. The power analysis is done on both the designs and their results are compared.

Tool used (Development tools - H/w, S/w): Spyglass, Conformal LEC, Verdi, Power artist.

Objectives of the project: To perform the power optimization of a test design.

Major learning outcomes: Design work flow, Power optimization of a design.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: The working environment was very good. All the colleagues were very helpful. There were continuous feedbacks from the manager as well as the mentor regarding the work I do and they helped me in resolving the issues faced.

Academic courses relevant to the project: Advanced VLSI design, Reconfigurable computing.

Name: R Deepika(2018H1400180G)

Student Write-up

Short summary of work done during PS-II: Power dissipation is a major design constraint in today's complex system-on-chip architectures, limiting performance, battery life and reliability. Changing the voltage affects power consumption and frequency. It is important to understand the variation of frequency as the voltage on the chip changes, thereby helping us to optimize frequency plans to the system-on-chip. It also helps in understanding the behavior of standard cells and to analyze the difference in their performances across technologies, which in-turn helps in effective design methodology. The project deals with use of Synopsys' PrimeTime which is a static timing analysis tool, highly customizable and fast, for delay scaling across voltages for various technologies.

Tool used (Development tools - H/w, S/w): Tcl, PERL, Python, Verilog, LINUX.

Objectives of the project: Technology benchmarking using Primetime based Ring Oscillator.

Major learning outcomes: Understanding the behavior of standard cells for various input pattern, variation of delays across various cells and technologies.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment was comfortable with the team members giving us tasks on a regular basis and helping us along for proper completion of the work. Regular interaction with mentor was a great support throughout. The company expects us to have a clear understanding of basic concepts in case the topic has been dealt with in the academic curriculum and if not, put in extra efforts in the beginning so that, sufficient amount of time would be available to work on the project.

Academic courses relevant to the project: VLSI design.

PS-II Station: Qualcomm India Pvt Ltd- Bangalore, Hyderabad

Faculty

Name: Gopala Krishna Koneru

Student

Name: UPASANA MUKHERJEE(2018H1030100H)

Student Write-up

Short summary of work done during PS-II: Being part of secure system group, the responsibility of the team is to focus on secure booting of the Qualcomm chipsets and governing the access control module. Till the midsem, I was responsible for understanding the entire secure boot flow, its necessity and applications. Apart from that, I had to understand the ARM architecture and concentrate on its memory management details. I have worked on analysing various factors responsible for the boot time of a chipset and if those can be modified. Access control module being the most significant contributor to the boot time of a chipset, the job was to optimise it yet pertaining to the security considerations. So, the task before midsem mostly included various timing analysis and understanding the existing process. Post midsem, we had proposed two ideas of optimizing the access control module focusing on the static configuration of various registers. The entire static configuration module is modified that has led to an achievement of around 90 percent saving of the boot time. Apart from this, I was also responsible for handling various change requests and propagation of the corresponding changed tasks.

Tool used (Development tools - H/w, S/w): Languages: C, Python, assembly language, Shell scripting. Debugging tool: Trace32. Qualcomm Specific tools (Alpaca, QFIL, Crashscope), Editor: Notepad++, Source Insight. Beyond Compare 4.3.3. Code Collaborator. Perforce.

Objectives of the project: Analysing The factors responsible of boot time KPI of Qualcomm chipsets and modifying them to optimise the KPI.

Major learning outcomes: Access control, Authorization, Certificates, ARM architecture, Memory management.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Many of my team members have also been comparatively new, so it has been a great learning experience all together. There is enough scope of learning and research and thereby expanding knowledge, even across domains. Concepts what has been read in books come alive in practical and you get to actually work on those algorithms, leading entire process to be exciting and providing a great opportunity to learn.

Academic courses relevant to the project: Computer architecture, Operating system, Network security & cryptography.

Name: UPASANA MUKHERJEE(2018H1030100H)

Student Write-up

Short summary of work done during PS-II: Being a part of secure system group of Qualcomm, my job started with understanding the entire secure boot module. This included the boot flow of Qualcomm chipsets, various authentication, authorization, encryption-decryption models. The project assigned to me was optimization of boot time KPI of Qualcomm chipsets. Boot time is an important factor in various domains such as auto, lot, so the project has a direct impact on those domains. I started analysing the access control module as it was significantly contributing to the boot time. First phase of job included analysis of the existing code and assess timing of various API, to see if anything can be optimised. We figured out two proposals for optimization, out of which the first one has been made mainline. The second proposal included modification of the entire access control configuration which on completion was giving a considerable reduction in the boot ime. Though, it has a dependency on a large portion of code changes and needs to be analysed further for putin git to mainline. So to summarize, my

work during the internship revolved around the secure boot and the access control module of Qualcomm chipsets.

Tool used (Development tools - H/w, S/w): Languages: C, Python. Editor: Source Insight, Notepad++. Beyond Compare. Perforce & Code Collaborator. Trace32. Alpaca, QFIL. Shell scripting. Qualcomm Chipsets, Jtag.

Objectives of the project: Analysis of the impact of the access control module in boot time of a chipset. Optimization of the access control module to improve boot time KPI for Qualcomm chipsets.

Major learning outcomes: Qualcomm secure boot flow and implementation; Qualcomm access control module. Concepts of operating system and computer architecture have been thoroughly utilised in practical applications.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: There has been enough opportunities to learn in terms of various documentations or sessions arranged, not only for your domain but across domains as well. Hence, the exposure is quite good. So, I would hope in the future, it will continue as same.

Academic courses relevant to the project: Operating system, Computer architecture, Network security & cryptography.

Name: MOKILI DEEPAK(2018H1030121H)

Student Write-up

Short summary of work done during PS-II: During the initial few months of the internship, I got a lot of training sessions on the internal team modules and frameworks. Got to learn about various teams, workings of various teams functionality wise. After a few months of training, I got

introduced to how various issues may arise and was taught the approaches on how to solve them. Sixty percent of my internship experience is about learning various modules and frameworks and understanding the internals of the design and forty percent is about solving issues and developing scripts.

Tool used (Development tools - H/w, S/w): Trace32, C, Python, Shell scripting, Practice scripting, QCOM specific tools.

Objectives of the project: To develop scripts for profiling boot time information and memory optimizations in the low power consuming mode of the mobile.

Major learning outcomes: I got to learn about the work environment of the software industry and how production code manifests into a consumer product. You will get to learn about standard coding practices and how to write optimal bug-free code. You will get to know about the internal design of a mobile phone and the workings of each processor in the mobile unit.

Details of papers / patents: Confidential.

Brief description of working environment, expectations from the company: For companies such as Qualcomm which mainly deals with producing mobile chipsets among others, one has to be good in C language as well as Python scripting. They expect us to be well versed with C and how to write optimal and secure code. There is a lot of software and hardware teams, each having their own specific goals and work, cooperating and developing newer chips. There is transparent & open communication and work-life balance is good and the company encourages employees to take on different responsibilities outside their daily tasks. People are friendly and welcoming and you can literally approach anyone, be it be a manager, director or VP and openly discuss the work. They also provide in-office games, like a ping pong table, board game station and snooker table, etc.

Academic courses relevant to the project: Advanced operating systems, Cloud computing.

Name: SARAH BIJU(2018H1030188G)

Student Write-up

Short summary of work done during PS-II: Development of an automation tool that eases analysis and debugging of windows video crash dumps.

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

Objectives of the project: Process improvement.

Major learning outcomes: Exposure to internal and external software, production level coding.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Wonderful work-life balance with very friendly team and environment. Very helpful HR and support teams.

Academic courses relevant to the project: Computer networks.

Name: NIMIT JAIN(2018H1120278P)

Student Write-up

Short summary of work done during PS-II: I was a part of Qualcomm audio team. So, I have to understand android audio architecture. Then, go through with Qualcomm audio architecture. My work included resolving bugs / errors in audio code and adding new features in Qualcomm audio architecture to support various audio use cases such as voice ui, voice recording etc.

Tool used (Development tools - H/w, S/w): Adb, ASAN, KASAN, JIRA, OpenGrok.

Objectives of the project: To resolve any errors / failures in android audio code and add new feature to the code.

Major learning outcomes: Understood the android audio architecture and Qualcomm audio architecture. Also, learnt how to compile and build android build, debug it using various tools and add new features to it.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment in Qualcomm is satisfactory. We got our own laptops from company to work on and additionally android device was provided to test your code for any errors or crashes. The team members were really helpful in executing day to day tasks. My mentor is also very helpful and guide me when ever I got stuck while performing my tasks. The expectation from my team is to communicate / update your status of task with other team members on daily basis so that everyone can know what you are working. Apart from that, it is expected that you finish your task with in the deadline given.

Academic courses relevant to the project: Software embedded system.

Name: AKHILESH SREEDHARAN(2018H1230199H)

Student Write-up

Short summary of work done during PS-II: To meet the ever-increasing complexity of modern-day processors and SoCs, traditional point to point connections are being replaced with the Network on Chip (NoC) architectures. NOC have an advantage of meeting the needs like scalability, physical routing feasibility at the same time they don't compromise on the speed. Architectures today implement different open standard AMBA protocols as they help seamlessly integrating peripherals from different vendors with the proprietary systems. To avoid re-spins in the design, VLSI design flow demands a step known as design verification. Design cycle of a semiconductor chip involves thoroughly verifying its functionality. My work at Qualcomm

involved verifying the bus architectures of mobile system processors. To thoroughly verify all the functionality, functional coverage is enabled wherein we create different test scenarios and provide different stimulus to ensure that all the functionalities are covered and verified. This process helps in catching RTL bugs at very early stage. Another design verification metric is toggle coverage which is done at the final stage of the design cycle. Toggle coverage enablement helps in catching bugs due to data corruption and ports being tied to incorrect values which may not be caught during the functional verification. Another task included writing assertions and developing checkers to verify different features in NOC. Assertions remain closely tied to the RTL and continuously keep monitoring the design functionality even when the main focus of simulation has shifted from the design functionality. So, design verification plays an important role in avoiding chip re-spins and reduces NRE.

Tool used (Development tools - H/w, S/w): Synopsys Verdi, Systemverilog, UVM, Assertion based verification.

Objectives of the project: Finding and reporting RTL bugs, thoroughly exercising different stimulus combination to verify different functionality.

Major learning outcomes: Functional verification at SOC level, ARM bus protocols and verification tools and technology.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: Expectation: The organization expects students to have knowledge in HDL and HVL languages. Knowledge of UVM can be of additional help since all the test bench used in industry is developed in UVM. Knowledge of C language is also a fundamental requirement. The organization expects students to develop debugging skills as they work through the project.

Working Environment: The working environment at Qualcomm is quite positive and lively. Though tight project schedules demand long working hours there is a lot of fun events like team outings, games, etc. which happen. Training is given utmost importance and sessions are arranged frequently for employees to develop new skills. Since most of my internship was done virtually due to COVID-19, we were provided with adequate hardware support and reimbursements for internet charges to cover our expenses.

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

Name: NARKHEDE HITESH MADHUKAR(2018H1230206H)

Student Write-up

Short summary of work done during PS-II: The work at Qualcomm was so exciting, first few weeks we have gone under training related to topics which organization is currently working on. After that, I was part of implementation team. My work was related to I/O timing closure of SoC. Lot of automation is happening in SoC design area and my work was to automate physical design guideline report independent of the project. I used TCL for script and this task caused a good hand of me over TCL. Also, I went through Qualcomm specific flows for synthesis and constraint generation.

Tool used (Development tools - H/w, S/w): PrimeTime, TCL, Python, Linux shell.

Objectives of the project: The scope of project was to introduce the flow of SoC design in organization. Firstly, we have been assigned to design a 16 point FFT block in RTL which gave us broad idea about VLSI design flow. The another project was to automate PD guidelines for constraint management system.

Major learning outcomes: Through the internship, I acquired sound knowledge of SoC synthesis as well as constraint management system. Along with that, I learnt about static timing analysis specific to I/Os of an SoC.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The environment at the organization was very productive and positive. The organization has balanced work life and personal life so well that employee never feels burden of work. It has all the modern facilities and benefits that an employee could ask for. All learning as well as working

resources are available. Currently, 5G technology is driven by Qualcomm and hope next generation will also be driven by Qualcomm.

Academic courses relevant to the project: VLSI design, Advanced VLSI design, CAD for IC design, VLSI architecture.

Name: KUSHANGI VARSHNEY(2018H1230207H)

Student Write-up

Short summary of work done during PS-II: As an intern, I was involved in debugging the mobile station modem SoC using a debug sub-system. I debugged and edited around 20 test cases and understood the different methodologies for debugging different scenarios. I understood different bus protocols like AHB, APB, AXI.

Tool used (Development tools - H/w, S/w): Verdi, Qualcomm tool, Linux.

Objectives of the project: Debugging mobile station modem SoC.

Major learning outcomes: I understood how to debug different errors in different scenarios.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment in Qualcomm is worth appreciating. The name "Qualcomm" itself declares its value and I myself have witnessed it. There is so much learning in every aspect and that too in a friendly way. In a nutshell, I like its culture with a bit more workload.

Academic courses relevant to the project: Test and testability and Vlsi architecture.

Name: MENON POURNAMI SALIL(2018H1230208H)

Student Write-up

Short summary of work done during PS-II: As a part of Design for Test (DFT) engineering of manufactured chips, various tests are carried out to detect the faults in the manufactured yield and repair them if possible. There are various tests like Logic BIST, MBIST, ATPG using ATE etc. depending on the module being tested. This project is divided into two parts. The main aim of the first part would be to understand MBIST or Memory Built-In Self-Test at an industrial level. MBIST is a method to test the embedded memories on an SOC with inbuilt circuitry. This project work would begin with comprehensive study on what is MBIST, why it is needed, how it is carried out, how to get the fault coverage, which are the faults that it targets and how to come up with solutions of repairing the faults. This project then aims at having a hands-on experience with designing the MBIST circuitry using various MBIST tools at an industrial level. The second part of the project deals with static timing analysis or STA which aims at determining whether the test circuitry can operate at the rated frequency and ensure there are no violations which might restrict the circuit from operating at the desired frequency. The internship also dealt with understanding the DFT insertion flow and the importance of DFT test circuitry.

Tool used (Development tools - H/w, S/w): MBIST related tool, Perl, Python, Qualcomm proprietary DFT flow, Primetime.

Objectives of the project: To understand the importance of design for test in electronic hardware and testing.

Major learning outcomes: 1) Learnt concepts of memory BIST circuitry insertion process.
2) Learnt concepts of static timing analysis and how to do timing analysis at an industrial level on hardware.
3) DFT circuitry insertion concepts and flow.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Got to work in a highly informative and friendly environment with some very creative and technically profound

minds who helped me throughout my internship tenure. Expectations from the company is a platform where I can get to learn a lot technically and apply the same in my career so as to grow in terms of knowledge.

Academic courses relevant to the project: VLSI test and testability, VLSI design, Advanced VLSI design, Analog electronics, VLSI architecture and advanced VLSI architecture.

Name: HARITA(2018H1230219H)

Student Write-up

Short summary of work done during PS-II: A low power block in CPU is synthesized, from its HDL description (either in Verilog or VHDL) to technology specific gate-level netlist that meets the design requirements. Static timing analysis is performed on the block for validating the timing performance and to check if the design safely operates without any timing violations at specified frequency of clocks.

Tool used (Development tools - H/w, S/w): Softwares: Genus, Primetime and Tcl scripting.

Objectives of the project: To synthesize a specific block in CPU. To perform timing checks (STA) for the block.

Major learning outcomes: Synthesis goals and company specific customized synthesis flow and it's implementation. Performing static timing analysis for validating the timing performance of the block.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment was great in terms of managing new hires, allocation of learning materials and projects, ergonomics, tools given by the company for work and overall good corporate culture thereby making the environment encouraging and comfortable.

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

Name: HITHESH H L(2018H1230223H)

Student Write-up

Short summary of work done during PS-II: CPU validaion: ARM based core functionality validation.

Tool used (Development tools - H/w, S/w): SOFTWARE: trace 32: FPGA Eemulation.

Objectives of the project: Validate the functionaliy of the CPU cores.

Major learning outcomes: ARMV8.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: I joined QUALCOMM HYD as intern for system validation and Emulation engineer profile. I have worked on mid tier phone snapdragon chip sets. The majority of the validation was done on ARM CORTEX A55, 53, 76 series CORE IPs from ARM. The work required deeper understanding of ARM architecture, computer architecture and proper programming in C. My work was never purely VLSI / microelectronics. I choose this profile as I was more interested in embedded profiles.

Academic courses relevant to the project: Computer architecture / VLSI architecture, Advanced computer architecture, EMBEDDED systems.

PS-II Station: Ramboll India Pvt. Ltd., Gurgaon

Faculty

Name: Mahesh K Hamirwasia

Student

Name: RANKARAJAN B(2018H1430034H)

Student Write-up

Short Summary of work done during PS-II: I was given a plan of a residential building for stability calculation. Identified all the stability walls from the plan, calculated the wind load base on Eurocode. Performed stability calculations and local stability checks. I also performed complete modelling, analysis and connection design for a steel structure with the help of Robot structural analysis software.

Tool used (Development tools - H/w, S/w): Robot structural analysis.

Objectives of the project: Checking the structure for stability and provide additional stability walls if required.

Major learning outcomes: Eurocodes, connection design, concept of stability in precast construction.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: Extremely peaceful work environment with great work culture and freedom. Tremendous scope for learning new things, complete access to latest softwares.

Academic courses relevant to the project: Precast building and steel structure design.

Name: MEHTA MANISH MANOJ(2018H1430041H)

Student Write-up

Short summary of work done during PS-II: I was working with Bridges team in Ramboll. I was involved in some ongoing projects of design and analysis of various components of RCC bridges and pile slabs and also in one of the RCC bridge assessment project. I got a good exposure on Eurocodes, Finnish codes and various practical aspects of bridge design. Along with this also got the opportunity to learn trending concept 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: Design of bridge components (deck, abutment, wing walls), Pile slabs.

Major learning outcomes: Practical design considerations and aspects related to bridge design.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is quite good and has a friendly atmosphere. All the employees are very kind and patient to help you. One good thing is there is a regular interaction with team leader to check the progress 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: Finite element method, Structural analysis, Strength of materials.

Name: AYUSH VIDYARTHI(2018H1440039P)

Student Write-up

Short summary of work done during PS-II: Work done on pavement design aspects of airfield side in Indian airports, preparation of brief on RFPs and other business opportunities, data management, took a dummy project to learn Civil 3D (Geometric design).

Tool used (Development tools - H/w, S/w): FAARFIELDv1.42, COMFAA, Civil 3D, MS Excel.

Objectives of the project: To know about design and planning aspects.

Major learning outcomes: Learnt different aspects regarding pavement design of runway, taxiway and apron, worked on software like FAARFIELD, COMFAA.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is helpful for learning new skills which is not just limited to design aspects but much more.

Academic courses relevant to the project: Airport planning and engineering.

PS-II Station: Reflexis Systems India Pvt. Ltd., Pune

Faculty

Name: Vijayalakshmi Anand

Student

Name: AKAASH MOHAN SAXENA(2015B1A80831H)

Student Write-up

Short summary of work done during PS-II: I was assigned the task to create an XML To CSV conversion utility, for their flagship product, and a CSV validation utility to validate CSV files. This was done to improve file handling efficiency for their product, it was later integrated into system.

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

Objectives of the project: To learn file handling operations, to build a web application based on restful api and mybatis.

Major learning outcomes: Learnt various things such as file handling in java, XML to CsV operations, AngularJS for frontend, Rest ful api, Spring MVC and Mybatis to create a professional standard web application.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: Work environment is pretty chill. Everyone is motivated to help you. A lot to learn, especially working with main team.

Academic courses relevant to the project: OOPS, DSA.

Name: RAJ BAKULBHAI JOSHI(2018H1030101H)

Student Write-up

Short summary of work done during PS-II: I was allotted the front end development team in the company. My PS started with working on Cypress, an end-to-end automation testing tool for front-end technologies. I wrote nearly 80 test cases and coded them in Cypress to automate the testing of our Reflexis workforce scheduler UI screen. Then, I was assigned some issues that we faced in the schedule UI screen. This issues included sorting based on display_sequence not working when a pdf of the schedule is generated. Another issue was I had to develop a

dropdown menu to display all the available stores in the above store page. This dropdown was dynamic and it changes when some other user logs in from different above store. Also, I worked on testing of the APIs with the use of postman application. With this application, we can develop and test various requests and get response from the server. Lastly, I started working on health check AI module. In this module, we were going to provide some insight based on the current statistics of the associates ad use some co-relation techniques to relate various statistics and apply data mining on these highly related statistics. Also, I learned some AngularJS basic functionalities like directives, loops, MVC, etc throughout the project.

Tool used (Development tools - H/w, S/w): Cypress, AngularJS, Java, JavaScript, Postman, APIs, Debuggers.

Objectives of the project: To dive into the pool of fronted development and testing using Java as back-end and AngularJS as a front-end technology.

Major learning outcomes: Learned about automation of front-end UI testing, JavaScript- from basic to intermediate level, AngularJS- basics.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working culture is quite enthusiastic. The work was lenient. The company expects its employees to be happy and work. They also provide a 'Happy Hour' every month, in which they play games and chit-chat for one hour. For work, they provide us a desktop. The equipment were all working and good. The team was ever helping and guided me whenever I faced some problems, either technical or non-technical. Overall, it was a good experience for me.

Academic courses relevant to the project: Software engineering.



PS-II Station: Rivigo Tech, Gurgaon

Faculty

Name: Ashish Narang

Brief write-up on each PS-II station : Rivigo Services: Rivigo Services Pvt. Ltd. Founded in 2014, is an Indian supply chain and logistics company that provide logistics services all across the country. Organization uses a unique relay model which puts them ahead of their competitors. Interns at Rivigo Services are exposed to web development , full stack development and a bit of natural language processing tasks. They are exposed to latest technologies like Java Springs, Android, React, Redux, Node js and Python etc. Organization prefer to have interns who have excellent programming and problem solving skills.

Student

Name: MAYANK SHARMA(2016A8PS0414G)

Student Write-up

Short summary of work done during PS-II: Development of frontend and backend for web applications using Java as server side programming language and Javascript for frontend development. Design and development of REST based web services using Spring Boot Java framework.

Tool used (Development tools - H/w, S/w): Mysql, JDK, Tomcat, Redis, Neo4j, NodeJS, Kafka, Postman, IntelliJ Idea, Maven, Gradle, Postgres.

Objectives of the project: To design and write highly scalable enterprise level code for web based applications.

Major learning outcomes: API definitions for backend architecture, Apache kafka for streaming messages, ReactJS and AngularJS for frontend development.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment of the company is really motivating and productive discussions and meetings are scheduled at regular intervals. Everyone is so cordial and ready to help even if the doubt is very

silly. Everyone is so helpful manager is very reachable for any queries that I had. Being an IT company, my expectation was that I will be involved in coding but what I realised that coding comes after design. I expected to learn many new cutting edge technologies and the organisation met my expectations, I got to learn so many tech related new stuff which I have never imagined.

Academic courses relevant to the project: OOP concepts are used for backend development using Java.

PS-II Station: Samsung R & D Institute, Bangalore

Faculty

Name: Lucy J. Gudino

Student

Name: MAYANK BHUTANI(2015B2A30836P)

Student Write-up

Short summary of work done during PS-II: Till mid semester, I successfully created a prototype demonstrating how we can increase sales of smart watch by providing customers the functionality to view the virtual smartwatch on their wrist using just smartphone camera before purchasing it. After mid semester, I contributed to another team's project in predicting the position of controller of ARGlass with only having orientation as an input.

Tool used (Development tools - H/w, S/w): Unity, Blender, Google ARCore, OpenVR, Jupyter, Anaconda.

Objectives of the project: Objective of the first project is to visualize smartwatch on user's wrist by just using smart phone camera. Second project objective is to predict the controller's position when only its orientation data is provided.

Major learning outcomes: Learnt a lot about AR software development for my first project. For second project, major learning was in the field of neural networks and inverse kinematics of human upper body motions.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Team members were great. Supported my work and cleared my doubts. They created comfortable environment to let me work on topics of my interest.

Academic courses relevant to the project: NA.

Name: GONDIMALLA APOORVA(2015B2A70650G)

Student Write-up

Short summary of work done during PS-II: Developed deep learning based action classification model for peak event detection from long videos.

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

Objectives of the project: Develop a deep learning model for human action recognition from videos with low model size, computation cost and latency.

Major learning outcomes: Action recognition architectures, Data pre processing, Implementation of deep learning models.

Details of papers / patents: Paper drafted for Samsung internal conference submission.

Brief description of working environment, expectations from the company: Good support from mentors and employees. Work closely with team with exposure to ongoing projects.

Academic courses relevant to the project: Neural networks and fuzzy logic.

Name: AYAN DUTTA(2016A3PS0174P)

Student Write-up

Short summary of work done during PS-II: The project was aimed at transforming an image without any background to a presentable form. It involved the generation of a background that would blend with the objects to as great an extent as possible. We explored various state-of-the-art deep learning approaches used for similar tasks. We incorporated the ideas of prevailing methods and built our model. We also created a custom dataset and trained / tested our model on the same.

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

Objectives of the project: Image beautification.

Major learning outcomes: Recent advancements in the field of deep learning, Generative adversarial networks, Image inpainting.

Details of papers / patents: Wrote a paper and submitted it for review.

Brief description of working environment, expectations from the company: Good working environment with the possibilities of getting hands-on experience of latest technologies. Really cool speeches from senior leadership giving a brief introduction to some of the recent accomplishments of the institute and future work the teams are focusing on. Friendly and cooperative team members ready to help at any time of the day.

Academic courses relevant to the project: Computer programming, Neural networks and Fuzzy Logic.

Name: MOHITH T S(2016A3PS0213P)

Student Write-up

Short summary of work done during PS-II: Samsung's Flagship phone (Note 10+) has a TOF camera present in it. Depth map generated from it with lower exposure time wasn't up to the mark. So, we developed a model which could process raw data obtained with very lower exposure time to generate high-quality depth map.

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

Objectives of the project: Generate high quality depth map from raw data obtained with very low exposure time.

Major learning outcomes:

1. Learnt how to train and test different networks.
2. How to make a detailed analysis of the intermediate result obtained in order to improve it (By separating it based on the various parameters).
3. Parameters which needs to be taken into consideration while generating the datasets.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is very good. Company expectations will be high.

Academic courses relevant to the project: NNFL, DIP, Machine learning.

Name: SRI MAHIJA MANDALIKA(2016A3PS0251H)

Student Write-up

Short summary of work done during PS-II: Understanding the methods used to detect gaze estimation and the various processes implemented. Determine the best way to detect gaze and increase the accuracy of estimation.

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

Objectives of the project: Detection of human gaze.

Major learning outcomes: Python coding and Pytorch commands.

Details of papers / patents: Written a paper to be submitted as IP.

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 and understanding and uplifting in their nature.

Academic courses relevant to the project: Computer applications.

Name: GAURAB DAS GUPTA(2016A3PS0255H)

Student Write-up

Short summary of work done during PS-II: I got the opportunity to work in two teams. The first project was developing an extension for Postman, in Node.js, to provide a set of custom features required by the development team. The second project involved developing a pattern mining extension in the smart things Android App.

Tool used (Development tools - H/w, S/w): Nodejs, Android, MongoDB.

Objectives of the project: 1. To create an all in one API testing solution for the cloud development team 2. Create a suggestion feature for predicting daily event execution in the SmartThings App.

Major learning outcomes: Nodejs, Backend development, Android development.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The work environment was friendly. But there is a time restriction of spending 9 hours in the office irrespective of the work load.

Academic courses relevant to the project: Object oriented programming, Data structures & algorithm, Database management system.

Name: Manasvi Kataria(2016AAPS0162H)

Student Write-up

Short summary of work done during PS-II: Developed a server for programmatic direct advertising and created portal pages for the same.

Tool used (Development tools - H/w, S/w): Java vert.x, HTML, Javascript, Swagger.

Objectives of the project: To add feature of programmatic direct in the existing RTB model for advertising.

Major learning outcomes: Learnt about digital advertising and the various stakeholders involved in the process. Also, learnt about full stack development.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment was very conducive and provided scope for learning and growth. The team members were quite helpful and friendly.

Academic courses relevant to the project: OOP.

Name: ETI MISHRA(2018H1030049G)

Student Write-up

Short summary of work done during PS-II: The project was on credit risk analysis - Default prediction. I worked on finding insights from customer data and make a default prection system using machine learning. To find whether a customer will make a default in repayment or not.

Tool used (Development tools - H/w, S/w): Python, Jupyter Notebook, Sklearn, Numpy and Pandas.

Objectives of the project: To predict whether a customer will make default in repayment or not for Samsung Finance +.

Major learning outcomes: Learnt about credit risk analysis, worked with large amount of data, used a pipeline approach to handle the project, the framework used was CRISP-DM.

Details of papers / patents: Submitted two page abstract currently for Samsung best papers, 2020. Results for the same are yet to come. The paper is related to the work done during the intern.

Brief description of working environment, expectations from the company: The time spent in the office was worth it, the environment was work focused but also has enough amenities to spend time with other interns for some leisure. However, due to COVID we didn't get enough time to spend in the company and work from home policies at Samsung are quite stricts so that was one hindernace during PS-II. It would be a better experience otherwise.

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

Name: AJAY UNNI(2018H1030052G)

Student Write-up

Short summary of work done during PS-II: Work was done on Android development and lens technology.

Tool used (Development tools - H/w, S/w): Android studio, OpenCV, PyCharm, Jupyter Notebook, CLion, Samsung flagship device.

Objectives of the project: Feasibility study & implementation of multi-camera recording and playback.

Major learning outcomes: Capturing multiple lens feed and multiple playback with an option to switch through the streams using an appropriate user interaction.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: My department was imaging R&D. My mentor, managers and colleagues were very supportive and helpful. Strict completion of working hours required. Free lunch and breakfast, transport, pantry, play area, gym, samsung e-store are available for interns.

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

Name: YARLAGADDA GEETA DHARANI(2018H1030099H)

Student Write-up

Short summary of work done during PS-II: Made a proof of concept for question answering expert system. Studied the existing methods to build question answering expert systems, built

the concept and implemented closed domain QA expert system to be integrated with Samsung mobile applications.

Tool used (Development tools - H/w, S/w): Python (Keras, Pytorch, tensorflow, Scikit), Android.

Objectives of the project: To implement question answering expert system.

Major learning outcomes: Deep learning, Natural language processing, AI enabled android applications.

Details of papers / patents: Nothing as of my Date of Relief. But it is going to be presented in Samsung internal conference with some changes.

Brief description of working environment, expectations from the company: The company provided with all the necessary equipment / infrastructure required to complete the project. I was assigned with mentor & reporting manager by the company, who were continuously guiding me through out the internship. The work environment is very good and interns were encouraged to propose new ideas. Overall there is good learning.

Academic courses relevant to the project: Artificial intelligence, Information retrieval, Object oriented programming.

Name: SINGH DEEPENDRA INDRABAHADUR(2018H1030132P)

Student Write-up

Short summary of work done during PS-II: Tensorflow uses Eigen C++ library at the backend to perform convolution. Eigen has two different types of matrices namely as Dense and Sparse. And it has different matrix multiplication algorithms for each of these so as to speed up the process. Convolution is converted into matrix multiplication problem to achieve the benefits of Eigen library. Tensorflow could only make use of dense matrices multiplication to perform

convolution. It could not take advantage of Eigen's sparse matrix library. My work was to implement convolution process with respect to Eigen's sparse matrix library. I was able to obtain considerable speed up in the convolution process on using sparse matrix multiplication instead of dense for sparse images and kernels.

Tool used (Development tools - H/w, S/w): Mobaxterm, docker, github.

Objectives of the project: Acceleration of Deep learning layers.

Major learning outcomes: Team work, How to do research on novel problems.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: I worked in SAIT division at Samsung R&D Bangalore. The work here is mostly research based, specifically, systems research. The team is small compared to other divisions. It consists of 60-70 people. SAIT itself has several teams working on different parts of samsung mobile products, mostly the flagship devices such as S20. My team consisted of 15 people, but my interaction was mostly with my manager only. My manager didn't expect me to be great from the first day, although one should keep improving and show the results so as to not take advantage of manager's leniency. I had two compulsory goals set by my manager. And one stretch goal (which was to publish the work).

Academic courses relevant to the project: Machine learning.

Name: PATIL KUNAL PRAMOD(2018H1240074H)

Student Write-up

Short summary of work done during PS-II: Writing test cases for file upload to server.

Tool used (Development tools - H/w, S/w): Node.js, Visual studio code.

Objectives of the project: To develop a chat app which can be used for file transfers as well.

Major learning outcomes: Got to learn new software like node.js, Python.

Details of papers / patents: No.

Brief description of working environment, expectations from the company: The environment in the company is good but just one regret that I didn't get PPO due to CORONA. You get to learn a lot of new technologies. The team members are motivating and help you if you are stuck at any point. Work-life balance is good.

Academic courses relevant to the project: No. All the academic courses were irrelevant. After coming to PS you have to learn a lot of new things.

Name: AMAN KUMAR RAI(2018H1240077H)

Student Write-up

Short summary of work done during PS-II: When a new Samsung device is under Development/Testing phase of pre-launch, nearly 30% of the issues reported on the Modem/Communications processor side are Modem crashes/System exceptions. Debugging each crash issue, involves Fetching crash logs from PLM, computing FL root cause, reporting the same to chipset vendor team and coordinating with them. This process takes nearly an hour for each issue, and during the software development phase, nearly 500-1000 crashes are reported on an average and this has a huge impact on the final schedule and effort. Emphasis of this project is to automate the entire process of fetch, compute and report cycle for CP Crashes and save critical development time as well as resources.

Tool used (Development tools - H/w, S/w): HTML, CSS, JQuery and Python.

Objectives of the project: Automating the entire process of crash analysis and reporting includes three major steps,

Fetching the issue log files from server stored in the database with proper indexing as well as downloading the corresponding binaries.
Computing which involves heavy loads.

Major learning outcomes: • Implementing concurrency through threads in python.

- Knowledge of debugging standards so as to do 1st level analysis of log files.
- Scripting in Linux and basic Linux commands.
- Web scraping, Exception handling and File handling through python.
- Basics of database management system and using Python for transaction of queries from database.

Details of papers / patents: No.

Brief description of working environment, expectations from the company: My team was quite supportive and there were weekly meetings. Team members were quite supportive and helped in every minute details of the project assigned to me. Just one regret that I didn't get PPO due to novel COVID19 pandemic.

Academic courses relevant to the project: No.

Name: KOTA SIVARAMAKRISHNA CHAITANYA(2018H1240082H)

Student Write-up

Short summary of work done during PS-II: I am working in a team with two other members and we came up with a model that can be able to classify the relevant information sent via KNOX messenger (an internal message service app in SRIB) into different categories, so that it can be helpful for the users to sort their information and find relevant information quickly. To do so, we came up with a Deep learning model to fulfill the task. The model contains three layers which are word embedding layer, convolution layer and recurrent layer. I worked on the convolution neural network layer which takes output from the word embedding layer and provides input to the recurrent neural network by connecting the word embedding layer and

recurrent neural network. In order to more accurately represent the semantic features of the text, the multi-scale convolution kernel is used to convolve the input data and the convolved result is pooled using the maximum pooling operation to further extract the important features of the text. Then, the pooled results are concatenated as the input to the LSTM layer. This is the work item assigned to me in my first phase.

As a part of work items assigned to me in second phase, I worked on developing an application which is an internal log analyzer for analyzing the logs which are received from the U.E, whenever some service is not occurred in it. These logs are captured in the local server and the captured logs are given according to the task which I am working. By taking these logs, I need to extract the required items like status of services registered and their timestamps, whether there is any switching from one service to another, required ids, apn name and type etc., by checking for the attach prints in the logs using Perl and Python scripting. This project aims to develop a tool which analyses and display the results to the user without the use of any third party application.

Tool used (Development tools - H/w, S/w): Software tools - Jupyter notebook, Python IDLE 3.6, Strawberry Perl.

Objectives of the project: The aim of the project which is assigned to me in the first phase is to come up with a model that help classify the relevant information sent via KNOX messenger (an internal message service app in SRIB) into different categories, so that it can be helpful.

Major learning outcomes: Natural language processing, Text classification, Deep learning, TensorFlow, Keras, 3GPP specifications, Automation using Python.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment at SRIB is very good. They provide us with all necessary facilities like meal card for food which includes breakfast and lunch, travel, cafeteria, recreation rooms for playing and wellness center for medical checkup which are required for an employee. The interns and full time employees are treated equally. The employees are kind and transparent. I am assigned to mobile communication R&D team. It is a good team and all the team members have very good communication skills and are very good at explaining the project and its outcomes. On a daily

basis, I used to report about my work to the team. Whenever I have any question related to our project, I can ask my manager. He used to suggest me an efficient way to proceed with the task to produce a better outcome. SRIB always aims to recruit employees having very good programming skills. This is the reason they conduct SWC (Software competency test).

Academic courses relevant to the project: Introduction to artificial neural networks (MEL G622).

Name: ISHA GAUR(2018H1240096P)

Student Write-up

Short summary of work done during PS-II: I worked on "Modem System Crash Debug Enhancement and Automation" project. This project work was entirely focused on automating the entire process of crash analysis and reporting in Samsung devices. It deals with the development of an automated log analysis system. The designed system includes the first level analysis functionality on the processor side using a multithread concurrent processing system. Furthermore, I created a local database that has to be interfaced with the web server, on the backend. I created this server using Flask, a Python framework. On the frontend, I designed web pages to provide user interface, for ensuring a successful end to end automation, by creating a fully functional website that the end-user can access and retrieve the required details as per the queries sent to the server. This is how, by designing all these building blocks, I helped my team in achieving end to end automation of modem system crashes.

Tool used (Development tools - H/w, S/w): Python, HTML, CSS, jQuery, Flask, MySQL workbench.

Objectives of the project: The objective of the project undertaken was to automate the otherwise tedious cycle of fetching, computing and reporting the CP (Communication Processor) crashes, that is, the system exceptions or the modem crashes on the modem / communication processor side.

Major learning outcomes: I attained a deep knowledge of various domains while working on this project. I started off with learning about the basics of Real Time Operating System (RTOS), multithread programming in Python and gradually, over a period of six months, I successfully managed to create a fully functional website, wherein, I learned user handling on the frontend and also, gained hands on experience on working with Flask, in order to create a server. In a nutshell, this project predominantly helped me to gain a good insight into three project areas, communication processor, automation and embedded systems.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The work environment largely depends on the team and particularly, the department that you are assigned to. However, in general, the work culture is very conducive to efficiency and accuracy. I had an amazing experience interning with Samsung. My manager as well as the team members were very supportive and guided me through out the duration of the internship. On the whole, this Internship has been an extremely enriching experience and has aided my professional career.

Academic courses relevant to the project: Database management, Embedded systems, Programming and scripting.

Name: KUSHAGRA GOUTAM(2018H1240100P)

Student Write-up

Short summary of work done during PS-II: The first task of the internship was focused on text classification using natural language processing. In which the objective is to classify the text received to a user into different categories according to the meaning of the text. The project was implemented in Python.

The Second task consists of the study of MIMO detectors and implementing an efficient non-linear detector for signal detection, combining it with a channel encoder and decoder. The implementation was done on MATLAB.

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

Objectives of the project: Text classification using Artificial Neural Network & MIMO detector using Path Preserving Trellis search algorithm.

Major learning outcomes: Natural language processing & Signal detection in wireless channel.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The company's environment is good since its a research-based facility, the interns are generally not allowed to work on live projects due to security concerns, hence special tasks are allotted to interns.

The company is mainly software-oriented, so even though the intern belongs to the team such as mobile communication R&D, you are expected to be good at both programming as well as scripting language (mainly PERL), MATLAB might come handy if you were given some research-oriented task to implement, apart from this thorough knowledge of standards and wireless communication is must from aspiring communication engineering students.

Academic courses relevant to the project: Advanced digital communication, Information theory & source coding, Artificial neural network, Channel estimation & detection.

Name: RAWOOL VISHAL SHIVRAM(2018H1240104P)

Student Write-up

Short summary of work done during PS-II: Understanding of 5G NR protocol stack architecture, and its underlying principles such as OFDM, MIMO, Carrier aggregation, Network slicing etc. Involved in development of a tool which required extracting various Information Elements (IEs) part of the UE capability message files and displaying the same in an excel sheet in a user readable and presentable form. This process of extracting the IEs from the message files and displaying it in an excel sheet needed to be automated and hence worked on writing scripts (in Python) for extracting the various IE values.

Also, worked on text classification using neural network, got exposure to various Python libraries which makes difficult tasks such as text processing look simple. Implemented a Deep learning based model (Machine learning) which involved merging convolution and recurrent neural networks to form a hybrid model known as Convolutional Recurrent Neural Network (CRNN), which intercepts and addresses the classification data tasks.

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

Objectives of the project: To develop a tool which displays all the IE values from UE capability message file for EUTRA and ENDC in a simplified and user-readable manner. It helps the engineer to study and understand the various parameters as defined in the 3GPP specifications.

Major learning outcomes: Various parameters in the 3GPP specifications for 5G NR and the flow of data through the various layers in the protocol stack.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Good knowledge of any scripting language (Python, Perl). Programming skills are a must since if you are aiming for a PPO you are expected to clear their own competency test which requires you to be good with your coding and also with data structures and algorithms. Previous experience of working on or exposure to trending topics such as Big Data, IOT, Machine learning, etc. is an added advantage.

Academic courses relevant to the project: Advanced digital communication (EEE G622), Artificial neural network (MEL G622).

PS-II Station: Samsung Semiconductor India R&D Center-Hardware, Bangalore

Faculty

Name: Anita Ramachandran

Student

Name: MACHE PARTH AJAY(2015B3A30609P)

Student Write-up

Short summary of work done during PS-II: The early part of the internship was spent in learning Python, UVM, Systemverilog and then understanding the existing tool developed before us and the project requirements. After that changes were made to the tool that we were working on to increase its compatibility and add new features and ported it from Python 2 to Python 3. Earlier the tool was developed as separate scripts, we had to integrate the scripts with multiprocessing to facilitate parallel running. We had to develop GUI for easier interaction with tool features rather than command line arguments. Finally, part of the tool was integrated in the test bench as tested for its functionality.

Tool used (Development tools - H/w, S/w): Red hat enterprise Linux, Python, System verilog, UVM.

Objectives of the project: Confidential.

Major learning outcomes: Learned system verilog, UVM, Test bench architecture, Python scripting.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is very professional and geared towards outcome. Interns are given the opportunity to present to the managing director and principal engineers. The mentors are very helpful and

give complete guidance and support to speed up the learning process and integration into the workflow.

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

Name: VANKADARA NAVEEN KUMAR(2016A3PS0313H)

Student Write-up

Short summary of work done during PS-II: A generic hardware design problem is given as an exercise. An Image Signal Processor module (filter) has to be designed. The inputs and outputs were given. The module takes an image in the form of pixels (one pixel at a time). Then, a kernel operation is performed on these pixels. The design made should support continuous data input and input coming with some time gap between two rows. After the design is made, its functionality is verified by writing a Verilog code for it. After the Verilog code written a C code which depicts the functionality of the design is written. Then, the correctness of the outputs is verified by this C model. This is done by passing the same set of inputs to the testbench of the design and C model.

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

Objectives of the project: To expose us to the industrial level of designing circuits which are used in day to day life.

Major learning outcomes: I learnt how to design a module and the ways to verify it.

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: The work environment is good and flexible. The mentors and manager are really supportive, cooperative and always welcome your opinion in discussions. Overall its good learning experience.

Academic courses relevant to the project: Digital design, C, Computer architecture, FPGA lab.

Name: AKHILESH SINGLA(2018H1120260P)

Student Write-up

Short summary of work done during PS-II: Pre lockdown: Backend development, code restructuring and debugging of a storage protocol for an internal tool.

During and post lockdown: Front-end development from scratch of an internal tool.

Tool used (Development tools - H/w, S/w): Pre lockdown: CPP, Visual studio, SVN, etc

During and post lockdown: JavaScript, CSS, ElectronJS, reactJS, etc.

Objectives of the project: Backend and front-end development for internal tools.

Major learning outcomes: ReactJS, ElectronJS, VS code, debugging, corporate culture, etc.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Great company. Chill work culture. No WFH here is actually a blessing because no one from the office is going to bother you after you have left the office. Good for work-life balance. Equally good for both software and hardware people.

Academic courses relevant to the project: None.

Name: DEEPAK PANDEY(2018H1230161G)

Student Write-up

Short summary of work done during PS-II: I created a tool using Python for automation in verification process. One of the daily tasks of verification engineers is to go through the nightly simulation regression failures. The hard part is to sort through the failures based on the simulation log files and error messages to determine what caused the failure, so this tool helps to optimize the triage problem with many more extra features.

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

Objectives of the project: Automation in verification process.

Major learning outcomes: Coding, OOPS, Verification, UVM.

Details of papers / patents: Nill.

Brief description of working environment, expectations from the company: Work environment was really good, mentors and managers were always ready for help. They didn't expect us to know everything in the starting but they do expect to learn things really quick as time goes. There were deadlines for the project so they expected us to deliver in time, overall it was a really good exposure to start the career.

Academic courses relevant to the project: CAD for IC design, Test and testability.

PS-II Station: Samsung Semiconductor India Research -Software, Bangalore

Faculty

Name: Anita Ramachandran

Student

Name: ASHISH PRATAP SINGH BHADORIA(2016A8PS0400P)

Student Write-up

Short Summary of work done during PS-II: The project allotted to me dealt with bad pixel detection and correction using neural networks. The initial phase dealt with image and signal processing basics as these were important to understand the problem statement. The next phase involved understanding the previous work done on the project and suggesting improvements. I analyzed the previous techniques and suggested some improvements. I also modeled some new architectures and techniques to improve the performance.

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

Objectives of the project: The project aimed to detect and correct the bad pixels present in the RAW image taken by a digital sensor.

Major learning outcomes: Principles of image and signal processing, knowledge of machine learning and neural networks.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is great with nice infrastructure and working spaces. The mentors and employees are very helpful and provide full liberty to try out new things. The projects are also well suited to the industry standards and provide various learning prospects to the students.

Academic courses relevant to the project: Image processing, Signal processing, Machine learning, Neural networks and Fuzzy logic.

Name: ANKIT SRIVASTAVA(2018H1230212H)

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 and Verilog for the organization's TCBPC IP. The model(s) in C++ acts as a golden reference for behavioural verification of

modules / sub-modules in SystemC and Verilog. 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, Cadence simvision and Cadence stratus HLS.

Objectives of the project: To design and develop models in C++ and modules / sub-modules in SystemC and Verilog for the TCBPC 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 CMOS image sensors, their artifacts (defects), and the various architectures associated with it. I learned approaches to perform bad pixel corrections for various artifacts and artifacts in low light conditions such as blooming, smearing, dark current, etc. I learned how optimizations are performed on software as well as on the hardware level. I learned to design and develop full-fledged algorithms on C++, SystemC and Verilog. I also got acquainted with the Linux platform and tools such as Cadence Sim-vision and Cadence Stratus HLS tool for design, 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 camera image sensors 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. Gym and indoor games are available. Cafeterias are there on each floor to savour tea / coffee anytime you want. SSIR also hosts several competitions from quizzes to innovation challenges. One of the most expectation(s) from this company is to hold campus placements at our Hyderabad campus, too, so that my fellow juniors can also get an excellent and enlightening experience.

Academic courses relevant to the project: Image processing, VLSI design, VLSI architecture, VLSI test and testability, CAD tools, Algorithm design and Data structures.

Name: MAYANK KUMAR(2018H1240072H)

Student Write-up

Short summary of work done during PS-II: Dual- mobile phones use technology which allows two SIMs to be used at a time. The technology allows for simultaneous access to services on the mobile network. But there is a disadvantage to it that for minimizing hardware consumption we have only one trans-receiver for both the sim. As a result, whenever the network (EnodeB) allocates the resources to a dual sim phone some of the resources go as waste because at a time we have only one sim active. Therefore, in this project our job is to calculate the amount of resource wastage that is happening for different Mac scheduling algorithms.

Tool used (Development tools - H/w, S/w): Ns-3 network simulator.

Objectives of the project: To calculate the resource wastage that happen in dual SIM phones for different MAC scheduling algorithms.

Major learning outcomes: Learnt about LTE technology, Ns-3, Oops, C++, Python scripting etc.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment is encouraging. There is a frequent and fruitful interaction with mentor and manager. Company expected me to complete the project and meet their deadlines.

Academic courses relevant to the project: Wireless and mobile communication.

Name: DEEPESH CHANDWANI(2018H1240075H)

Student Write-up

Short summary of work done during PS-II: The main aim of this project work is to do the "Estimation of overhead due to reference signals in LTE & NR based networks". So, in this task, the initial calculations comprises of calculation of no. of RE'S acquired by LTE channels (csrs, sss, pss, pbch) and no. of RE's acquired by SSB (combination of sss, pss and pbch) and Coreset 0 (Pdcch 0) in 5G NR. So as a final result, it is proved that SSB and Coreset 0 played a crucial role in 5G NR, as in this less RE (resources) were acquired by them compared to more RE acquired by LTE channels. The major reason was CSRS was not here in NR due to which the saved RE's were utilized for data instead of physical layer channels, which indirectly gave rise to more throughput (data rate) in NR and less bandwidth wastage as compared to LTE. As an add on some simulations of LTE modules was done on NS3 software, from which the resultant plots like path loss effect v/s increasing distance of UE (user) from enB, sinr effect v/s increasing distance of UE (user) from enB were observed.

Tool used (Development tools - H/w, S/w): LTE downlink resource element visualization tool, matlab, Ns3 software.

Objectives of the project: ESTIMATION OF OVERHEAD DUE TO REFERENCE SIGNALS IN LTE & NR BASED NETWORKS.

Major learning outcomes: Understood overhead due to Reference signals resource elements (REs) in Long Term Evolution (LTE) and New Radio (NR) networks. At physical layer, reference / pilot signals are used for control, signaling and synchronization tasks accurately computing the overhead REs is necessary to achieve an efficient system design. The current study is aimed at exploring the influence of overhead on LTE/NR downlink performance. Current work modelled all overheads for synchronization, controlling and signaling operations in LTE/NR physical downlink shared / control channels. This allows for dynamically computing the useful REs (by subtracting the overhead REs from the total ones), both per Transmission Time Interval (TTI) and per frame (and hence, the corresponding bit rates). Our data rate-based performance model is able to accurately compute the real, exact system data rate or "throughput" (instead of approximations). Aiming at understanding the impact of each overhead mechanism, carried out a variety of simulations and the simulation results prove our starting hypothesis that the influence of overhead on LTE/NR performance should not be neglected. Finally, the model quantifies to what extent throughput gets improved in NR systems over LTE with reduced overhead REs.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working culture was amazing with all talented, enthusiastic and passionate people around me. The deadlines were very sharp and there was something new to learn or pick up on on a daily basis. This kept us occupied and never felt bored. There were also fun events organised by the company sometimes. The company expects us to pick up new tools and concepts soon, by doing our study. Also expects us to be good at coding.

Academic courses relevant to the project: Wireless and mobile communication, c++.

Name: KRUSHNALI DHANRAJ BHOSALE(2018H1240109P)

Student Write-up

Short summary of work done during PS-II: I have worked on a live project of a tool (Aggregator Emulator Tool). I was actively worked on designing the input side of the tool. The designing required Python programming and some of the linker functions with C. After the design is done, I have studied how to create a GUI for the same tool. I have worked on another tool called 'File management tool" independently. I have completed basic design operations and the automation of the tool with Python and Perforce Version Control system. GUI is the next plan to proceed.

Tool used (Development tools - H/w, S/w): Python36-37, Pyscripter, Notepad++ as editor, Perforce Version control system.

Objectives of the project: Aggregator Emulator Tool -To allocate local oscillator frequency to the mixer at the RF receiver side, File management tool- To get notifications for changes done on a set of files on perforce.

Major learning outcomes: I have learned the Perforce working for version control. I have learned various modules in python. Detailed understanding of LTE, 3gpp specs.

Details of papers / patents: I have referred various modules of Python and online papers.

Brief description of working environment, expectations from the company: I really enjoyed the working environment of the company. All the teammates including my manager were so helpful in the work. I had so many expectations for the project, now I can definitely say it was a very good learning experience. I got to know about the different technologies and software used in the company. I got along with the teammates within a week and started attending meetings and sync-ups daily. Overall, It was a very fruitful PS industrial experience.

Academic courses relevant to the project: RF microelectronics, Mobile communication.

PS-II Station: SAP Labs, Bangalore

Faculty

Name: Seetha Parameswaran

Student

Name: SMITH RAJESHKUMAR SHAH(2016A7PS0039P)

Student Write-up

Short summary of work done during PS-II: A readme was created for the project firstly which also included links to the knowledge transfer session held initially. Test scripts were written to test user access endpoints with different scopes. Code refactoring was done to eliminate redundant endpoints and cleanup the unnecessary code. Also, certain reports pertaining to the data was generated using Pandas for better understanding. A very important feature developed by me was automation of the PowerPoint generation using the PptxGenJS library which reduced the manual effort from around 2 days to 10 mins per customer. The ML algorithm used for classification of the newly added features into the categories as per the change was improved quite substantially. An important backend endpoint and frontend interface were developed for creating and deleting users using Node.js and Vue.js.

Tool used (Development tools - H/w, S/w): 1. Vue.js 2. Node.js 3. Python 4. Flask 5. Postman 6. JupyterLab 7. GitHub 8. ZenHub 9. Chai and Mocha 10. PptxGenJS.

Objectives of the project: The objective of the project was to help in the development of the Release Assessment and Scope Dependency tool. The tool was meant to help the customers understand with ease the new features released every quarter for the SAP S/4HANA cloud in a pdf version.

Major learning outcomes: • Python frameworks and JavaScript libraries

- End to end development and integration of new features
- Team work
- Project organization and management
- Time management
- Understanding how to read others code
- Documentation of work
- Collaborating using Git
- Agile methodology
- Understanding apps requirements from user's perspective

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment of the company is indeed very good. It has won the award for best place to work. The members of the technical as well as non technical team are very helpful. The work life balance is very good. Also, the working hours are quite flexible and the work from home policy is also quite liberal. All in all, its a good place to work at.

Academic courses relevant to the project: None.

Name: VATSAL JIGNESH BADAMI(2016A7PS0071P)

Student Write-up

Short Summary of work done during PS-II: Backend development in Java involving both monolith and microservice architecture.

Tool used (Development tools - H/w, S/w): Java, REST APIs, Olingo, JUnit, Mockito.

Objectives of the project: Work on diverse tasks (backlogs and tickets) related to backend development.

Major learning outcomes: Backend development, large scale development and maintenance of code, JWT tokens.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Flexible working hours, supportive and friendly people. Interns are treated as regular employees. Expectations are low in the starting months but increase gradually.

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

Name: SANCHIT SHRIVASTAVA(2016A7PS0072P)

Student Write-up

Short summary of work done during PS-II: Completed backlogs and tickets for ASPM (Asset Strategy and Performance Management) organisation. Involved use of SAPUI5, Javascript and Java. In parallel, I also developed a dashboard for development and devops team using Javascript.

Tool used (Development tools - H/w, S/w): Javascript, Java, SAPUI5, IntelliJ, VScode.

Objectives of the project: Design dashboard for dev and devops team and solved backlogs.

Major learning outcomes: Front-end development, work culture in IT company like use of pipelines, jenkins, tickets, jira etc.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Flexible working hours, helpful coworkers, chill manager, just complete the backlogs in time.

Academic courses relevant to the project: OOP, DBS.

PS-II Station: Servicenow Software Development India, Hyderabad

Faculty

Name: Y V K Ravi Kumar

Student

Name: SHAHEER AZAM(2015B4AA0621H)

Student Write-up

Short summary of work done during PS-II: Created a web component using proprietary framework, for recording screen activity and raising incident with recording attached.

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

Objectives of the project: Simplifies the process of raising an incident and adding screen recording as attachment.

Major learning outcomes: Seismic.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Very accomodating and helpful people. Work hours are flexible as long as deliverables are delivered.

Academic courses relevant to the project: NA.

Name: SIVARAJU VENKATA RAVITEJA(2018H1030096H)

Student Write-up

Short summary of work done during PS-II: Worked on a code review tool which ensures that the company's coding standards are followed in spirit by the developers. This tool known as "ReviewNow" acts as a bot. Whenever a new pull request is raised on the GitHub it reviews whether the new code is according to the defined standards. These standards can be created using a UI which was developed to create them on the fly. Apart from reviewnow tool implemented domain separation in an application and written Junit to perform automated testing on it.

Tool used (Development tools - H/w, S/w): Servicenow platform, Javascript, Junit framework.

Objectives of the project: To make sure that all the developers get acquainted with coding standards of the company quickly.

Major learning outcomes: Scrum methodology, Servicenow platform and JUnits.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is really good. Facilities for recreation is available in the office. All the team members were helpful and friendly. Enough time is given to learn and implement. During work from home (because of Covid situation) also support and mentoring was always there.

Academic courses relevant to the project: NA.

Name: MANAV SETHI(2018H1030119H)

Student Write-up

Short Summary of work done during PS-II: Enhanced a code review tool which ensures that the company's coding standards are followed in spirit by the developers. This tool known as "ReviewNow" acts as a bot. Whenever a new pull request is raised on the GitHub it reviews whether the new code is according to the defined standards. These standards can be created using a UI which was developed to create them on the fly.

Tool used (Development tools - H/w, S/w): ServiceNow platform, ServiceNow studio, GitHub APIs, JavaScript.

Objectives of the project: To enable coding best practices.

Major learning outcomes: 1) Agile Development 2) GitHub APIs 3) Coding best practices.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment was excellent. My peers were very warm and helpful. They helped me to get into pace with the working of the company and were always ready to help in case I faced any problems.

Academic courses relevant to the project: Not applicable.

PS-II Station: Shell Technology Center, Bangalore

Faculty

Name: K Santosh Sopanrao

Student

Name: KARTIKEYA ADITYA(2016A1PS0740P)

Student Write-up

Short summary of work done during PS-II: Work is largely research based. It includes going through research papers, collect industrial data available through mainly online sources (though supplementary readings will be provided by the lead members) and propose a 20-40 page report suggesting improvements in existing work or proposing new ideas. It is not too laborious.

Tool used (Development tools - H/w, S/w): ProMax, MS excel, MS word, MS powerpoint.

Objectives of the project: Though it is confidential, but it is related to finding constraints in the software.

Major learning outcomes: Technical knowledge (topic based), Team work (greatly enhanced), Timely submission of deliverable.

Details of papers / patents: No papers published (However a lot of information has been gathered through ASRL).

Brief description of working environment, expectations from the company: Working environment: It's comfortable (home-like), peaceful yet energetic, lively.

Expectations from the company: Company has always been ahead in solving all sorts of problems, not just technical work related, but also in managing IT, managing games, managing transport. I will maintain its position in Forbes 10 ranking.

Academic courses relevant to the project: Reaction chemistry, MS excel.

PS-II Station: Siemens PLM Software, Pune

Faculty

Name: Sudeep Kumar Pradhan

Student

Name: HARSHAN JAYAKUMAR(2018H1410131H)

Student Write-up

Short summary of work done during PS-II: Finalizing the design of a new product or redesign of an already existing product is the very initial stage of any product development, which itself takes a long period due to many factors which will be discussed in this report. There is a need to reduce this period by making available the Inspection data at the very starting stage to the designer so that it will be easier for the designer to make decisions while deciding the tolerance values for a process. This can be done by storing the product data and corresponding inspection data in a common database and using this data for decision making with the help of different Machine learning techniques. This project work focussed on developing and integrating a module into SIEMENS NX, such that recommendation on dimensioning and tolerancing can be provided to help in predictive modeling. Multiple prototypes were developed for predictive modelling as spread across as different NX applications like modelling, assembly, inspection and CMM. Improved modelling and tolerancing tools and user control tools to achieve them have been discussed. Various implementation of recommendation tools have been discussed, like using CMM measurement output point cloud data to a train a neural network model against a dimensions from a MBD and dimensional variations it makes with actual manufactured part. Finally, some ideas on broader integration of recommendation tools for manufacturing tolerances across product development process has been put forward as a future scope.

Tool used (Development tools - H/w, S/w): C/C++, Python, Visual studio, MSSQL server tools, Sql server management studio (SSMS), Pycharm, Scikit-learn, torch, pandas, pyodbc, SIEMENS NX proprietary code and APIs.

Objectives of the project: To design, develop and integrate a predictive modelling and intelligent tolerancing module in SIEMENS NX.

Major learning outcomes: Inculcated in myself a sense of working as a team integrating professionals from multiple knowledge domains. Understood the importance of work place communication and regular stand-up meetings. Code practices maintained in such a organization was very worth getting adapted and to emulate. Had a good understanding of software development process and its various phases like ideation and user stories, Agile development, testing etc.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: SIEMENS DISW (formerly SIEMENS PLM) Pune is the largest PLM software company in the world in terms of employee strength and developments carried out. The organization is very known for keeping world class work ethics and job practices. Work environment is very wholesome and holistic, such that you could surely be learnt across your domains. Open communication and transparency is promoted very much. Hackathons are used to be conducted to bring up the innovations. Prior training will be very short and have to learn through work and regular meetings and you are always encouraged to bring up the new solutions to add value to the project and your company as whole. If you want to stand out you shall work towards a implementing a working code and get it integrated to SIEMENS software portfolio. There are multiple software developments happening like Teamcentre, Amesim, NX suite (CAD, CAM) and as from an intern, company do expect a cross-domain communication from you depending upon the project. For our project, in case, it got budded as part of a hackthon idea and required extensive data analytics and inputs from across-domains. You will be considered as more as a valuable solution providers more than mere coders. Company do expect thorough inputs from you along with a prototype presentation to the minimum.

Academic courses relevant to the project: Basic programming knowledge.

Name: KARAKE ROHIT RAOSAHEB(2018H1410150P)

Student Write-up

Short summary of work done during PS-II: Understood the problem statement at higher level and proposed corresponding solution. Developed workflows to achieve that solution. Proposed possible user interfaces for getting work done. Developed user interfaces using NX core. Developed data structure for relational database using Microsoft SQL server.

Tool used (Development tools - H/w, S/w): Siemens NX, Visual studio, Python, Microsoft SQL server.

Objectives of the project: Objective was to develop a solution to minimize the product development cycle period by developing an advanced data structure.

Major learning outcomes: Got to learn the phases in product development cycle and what are the critical factors that affect the overall process. Got to learn the main pain points of the product producing industries. Got to understand and work on the process for developing CAD software. Learned different aspects of relational database.

Details of papers / patents: As the work was to develop a feature for an already existing software, the reference material we followed was all company videos and presentations.

Brief description of working environment, expectations from the company: The working environment was agile. Work was well distributed and constant engaging tasks kept me motivated for learning new things. All the mentors were so friendly and supportive and were available whenever I seek for guidance. Provision of training before doing a particular task was the best thing about the company.

Academic courses relevant to the project: Product design, CAAD.

PS-II Station: Siemens technology and Services Pvt. Ltd., Bangalore

Faculty

Name: Pradheep Kumar K

Brief write-up on each PS-II station: Required more knowledge on Artificial intelligence, Quantum computing, Augmented and Virtual reality, Blockchain.

Student

Name: MAYANK GAUR(2018H1060161H)

Student Write-up

Short summary of work done during PS-II: My work is upon automation of engineering software. In my project, I need to built a decision support system for the operation in the software in which I need to automate the common process done by the user to reduce time and money for the organization.

Tool used (Development tools - H/w, S/w): Anaconda Jupyter, Anaconda Spyder, QT designer.

Objectives of the project: To help the beginner in the task with the help of intelligent software.

Major learning outcomes: Coding part is a major learning outcome for me.

Details of papers / patents: Not yet.

Brief description of working environment, expectations from the company: Working environment is good in Siemens Bangalore, canteen food quality is also very good there.

Academic courses relevant to the project: My project was related to the CODING, which is more related to the computer science stream.

Name: KIRANGE PIYUSH PRASHANT(2018H1060167H)

Student Write-up

Short summary of work done during PS-II: I am working on automation of computer aided manufacturing. The objective is to eliminate the repetitive task in the manufacturing process and decrease the through put time of the product. The steps involved in the CAM process are studied in detail and they are automated using Python.

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

Objectives of the project: Automate the CAM process. There are various complicated step in the CAM process which will be automated to reduce the throughput time of the product.

Major learning outcomes: Python, CAM process.

Details of papers / patents: ASME Journal of Manufacturing Science and Engineering (In the process of publishing).

Brief description of working environment, expectations from the company: It is good for those who are willing to do project based on Artificial intelligence in manufacturing domain. Most of the things you will have to do on your own which is great from learning point of view. Overall, good working environment and mentors are also helpful.

Academic courses relevant to the project: Manufacturing engineering.

PS-II Station: SMEC India Private Limited., Gurgaon

Faculty

Name: Mahesh K Hamirwasia

Student

Name: SHUBHAM BHATNAGAR(2018H1300076P)

Student Write-up

Short summary of work done during PS-II: I worked as a business analyst. This profile includes creating dashboards for different purposes such as forecasting business development by using the past data, for some projects to get the summary of the same and to forecast its financials or revenue generation in future months, to keep a track on business unit performances. Sometimes, for some critical projects, we have to read and understand the contracts too.

Tool used (Development tools - H/w, S/w): Microsoft excel, Power BI, Tableau, Microsoft power point.

Objectives of the project: The objective was to learn the analysis of the business and how the business runs in day to day life.

Major learning outcomes: Understanding the financial no's. and how to play with them.

Details of papers / patents: NIL.

Brief description of working environment, expectations from the company: The working environment is very good, working hours are fixed i.e. 9 hrs. which is comfortable in an MNC. The expect that we learn more and more and can grab all the stuffs they are working with in deep so that we can our contribution in much more things.

Academic courses relevant to the project: Transportation system and Management planning, Urban mass transit system.

Name: YASH RASTOGI(2018H1300086P)

Student Write-up

Short summary of work done during PS-II: I was mainly involved in team doing bidding for the fresh opportunities. There, I had the responsibility to prepare work plan, manning schedule and methodology of the work to be executed. I prepared bidding for all 6 packages of Gujarat, also to many MORTH and NHAI projects. I got a chance to create vertical profile of two strings in Kerala project. I also worked over traffic data of Kerala and calculated seasonal correction factor and analyzing OD data to know the location of traffic booths. I have also verified the thicknesses provided in Kerala project using IITPave.

Tool used (Development tools - H/w, S/w): IIT pave, MX roads, Google earth, MS excel, MS word.

Objectives of the project: Widening of 2 lane to 6 lane.

Major learning outcomes: Get the exposure to real time problems, got an understanding of the softwares used.

Details of papers / patents: Not yet.

Brief description of working environment, expectations from the company: Seniors are quite helpful. They help me in adjusting to new environment. They help me in understanding the work culture. My head of department and director are quite supportive. They helped me a lot while I was going through tough times.

Academic courses relevant to the project: Traffic engineering, Pavement materials, highway design.

PS-II Station: Solar Energy Corporation of India, Delhi

Faculty

Name: Mahesh K Hamirwasia

Student

Name: ANKUR GOYAL(2018H1430064P)

Student Write-up

Short summary of work done during PS-II: My work was to assist with the design of unconventional solar module mounting system. I also had to make excel formula sheets to reduce the tedious work. Learnt a lot about new features of STAAD as well.

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

Objectives of the project: Design of Vertical Module Mounting Structure and Design of MMS over Overburden Dump.

Major Learning Outcomes: Design of Light Gauge Steel structures, Wind load calculation over model mounting structure (MMS).

Details of papers / patents: Nil.

Brief description of working environment, expectations from the company: The company offers a very friendly atmosphere as far as work is concerned, people are helpful. People tirelessly work on projects.

Academic courses relevant to the project: Design of steel structure, Wind load calculation and application.

PS-II Station: ST Microelectronics(I) Pvt. Ltd., Greater Noida

Faculty

Name: Rajesh Kumar Tiwary

Student

Name: Ganesh Prasad B K(2018H1230151G)

Student Write-up

Short summary of work done during PS-II: Task1: Built a GUI based folder comparison tool using Python.

Task 2: Prepared test cases to check to compare simulators from different vendors

Task 3: Automating the task of updating schematics by parsing the netlist using Python & SKILL.

Task 4: Creating virtuoso forms and adding customized features to already existing virtuoso std. forms using SKILL script to reduce the human effort for designers.

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

Objectives of the project: Simulation & automation of various analog flows using SKILL scripting & Python.

Major learning outcomes: Learnt SKILL scripting language. How to go build a project from scratch.

Details of papers / patents: No papers / patents.

Brief description of working environment, expectations from the company: The working environment is really good. Right place to start your career. Work & personal life balance is good at least in the first 2 years.

Academic courses relevant to the project: Analog IC design and VLSI design.

PS-II Station: Strand Life Sciences Pvt. Ltd., Bangalore

Faculty

Name: Bharathi R

Student

Name: SHREYA BANERJEE(2018H1290003P)

Student Write-up

Short summary of work done during PS-II: The projects majorly focused on the understanding of somatic cancers and its causes and related therapies. For this, in depth studies and analysis were done which helped me understand the signaling pathways and the biomarkers which were the mutations causing the diseases. Analytical work was done on clinical trials of drugs and several other drug target studies to help the organization go towards a better therapy.

Tool used (Development tools - H/w, S/w): Analytical tools, Splice site prediction tools.

Objectives of the project: To study and work on somatic cancers and their biomarkers which would then help us analyze their importance and drug target activities.

Major learning outcomes: The major thing I learnt was the work place ethics and decorum. I also gained a lot of knowledge not only about the work going on in the organization but also about good team work and maintaining work life balance. My subject knowledge has increased vastly which shall be put to good use in the future.

Details of papers / patents: Cannot be disclosed under company rules and regulations.

Brief description of working environment, expectations from the company: The working environment was very helpful and cheerful and especially my team made sure I got well settled. The company took care of all our needs and enabled us in maintaining a good work life balance.

Academic courses relevant to the project: Yes academic courses were very much relevant to my project and the knowledge gained through the semester courses helped me grasp things faster in the work place and hence I was able to start on projects earlier.

Name: ADITHYA M(2018H1290005P)

Student Write-up

Short summary of work done during PS-II: Genetic interpretation of Germline cancer samples of patients from various hospitals across the country. Patients who are affected with hereditary cancer and / or a strong family history of cancer are advised by their respective physicians to undergo genetic testing for key genes which are key in cancer development. These samples (blood / saliva) are then sequenced using Next Generation Sequencing (NGS) to check for mutations (if present) so as to identify the cause of the cancer and further prognosis. Identification of a variant is a detailed process involving bioinformatics and theoretical knowledge about the mechanism of action of these genes. My work revolves around the interpretation of the said genetic data, screening, scoring for pathogenicity and reporting of identified variants (if any).

Tool used (Development tools - H/w, S/w): Splice predictors (for variants affecting splicing), various online websites and research journals, strands website and bioinformatics tool associated with it.

Objectives of the project: Genetic testing and screening of genes involved in Germline cancer.

Major learning outcomes: Genetic analysis, mechanism of action genes, classification of clinical significance of variants, usage of bioinformatic tools and data analysis.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work environment is conducive for people to grow and learn in the field. Sociable colleagues and

team heads make it easier for us to learn and adapt to the many challenging features of the work and they actively involve us in all the meetings and projects so that, we don't feel alienated. The company did not treat me like an intern and cut me slack, but rather as an employee and entrusted work with confidence and helped me in achieving the goals and targets.

Academic courses relevant to the project: Advanced Cell and Molecular Biology, Molecular Mechanics of Gene Expression, Stem Cell, Cancer Biology and Human genetics were relevant and the knowledge that I gained in these subjects were of great help.

PS-II Station: Synopsys (India) EDA Software Pvt. Ltd., Bangalore

Faculty

Name: Vineet Kumar Garg

Student

Name: SRISAI ANIRUDH IRUVANTI(2018H1230202H)

Student Write-up

Short summary of work done during PS-II: Synopsys has got multiple business groups and the group I work in, deals with developing IP for customer specification. As an ASIC digital design intern, my work involves writing RTL code for the product specified. This involves understanding the functional specification, documenting, writing the RTL code and doing basic tests to check for syntax and functional errors. The RTL which I had to write is a small part of a bigger project. I had to add the code to an existing product code and build features upon that.

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

Objectives of the project: RTL design for ASIC products.

Major learning outcomes: Able to learn writing RTL code for big projects and collaborate with team.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The team and management are friendly. Company expects to learn the tools fast and have hands on work to get practical knowledge.

Academic courses relevant to the project: Computer architecture and VLSI design.

PS-II Station: Tata Digital Health, Bangalore

Faculty

Name: H. Viswanathan

Student

Name: Ritik Bansal(2015B1A30750G)

Student Write-up

Short summary of work done during PS-II: Front end development which involved integrating APIs updating existing APIs, removing bugs, solving customer faced issues and developing including a new payment card.

Tool used (Development tools - H/w, S/w): Vs code, Reactjs, Jira, Bitbucket.

Objectives of the project: Learning of how to be a front-end developer for PWA.

Major learning outcomes: Reactjs understanding, Working with redux.

Details of papers / patents: No paper / patent.

Brief description of working environment, expectations from the company: Very supportive people and the work culture is excellent with very friendly and cooperative people. No pressure of work exerted of any kind. The company works in a very systematic work, doesn't expect you to work above your work timings.

Academic courses relevant to the project: Wasn't a CS student not really sure about it.

Name: ANKUR INDAULIYA(2016A4PS0410H)

Student Write-up

Short summary of work done during PS-II: I worked in back-end. Wrote some APIs in Java by using Spring Boot framework for different micro-services. And worked on integration of third party tool with the organization's product also which greatly increased the efficiency of the product in certain scenarios.

Tool used (Development tools - H/w, S/w): Spring boot framework, Eclipse IDE.

Objectives of the project: To write APIs and implement different third products to utilise in the company.

Major learning outcomes: Data base management, efficiency of APIs.

Details of papers / patents: I did not deal with any patents / papers.

Brief description of working environment, expectations from the company: The working environment is very conducive for a new comer. Lot of encouragement and guidance is provided. A mentor was allotted, who was always ready for guidance and feedback. I was thoroughly guided and saw a great improvement in the way a programmer thinks.

Academic courses relevant to the project: OOP, Operating systems, DSA.

PS-II Station: Tata Motors Ltd., Pune

Faculty

Name: R S Reosekar

Student

Name: PATIL PARTH TUSHAR(2016A4PS0277G)

Student Write-up

Short summary of work done during PS-II: Time crunching and modifications of NPI process.

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

Objectives of the project: To reduce the time required to make a new vehicle form scratch.

Major learning outcomes: Soft skills, Manufacturing processes, MS project.

Details of papers / patents: NPI stands for New Product Introduction is the document which includes all the process which are to be carried out while manufacturing a product. It also includes the timelines of various critical taks and how it is going to be carried out.

Brief description of working environment, expectations from the company: The working environment is very suitable for growth and mentors have a friendly approach towards interns, company expects you to complete the work on time and proper discipline and regularity in office.

Academic courses relevant to the project: Machine design and Drawing.

PS-II Station: Tata Steel, Jamshedpur

Faculty

Name: Arun Maity

Student

Name: PATIL NILESH RAVIKANT(2018H1410151H)

Student Write-up

Short summary of work done during PS-II: My project was vibration analysis of taper roller bearing cage. So, I collected information and data from research papers and IBA system and I calculated bearing life and service factor. Then, I modelled TRB in CREO and simulated in Ansys16.

Tool used (Development tools - H/w, S/w): CREO and ANSYS-16.

Objectives of the project: To calculate natural frequency of cage.

Major learning outcomes: How to apply formulae and boundary conditions to real world problem in software.

Details of papers / patents: Nothing.

Brief description of working environment, expectations from the company: My department was SSTG where root cause analysis of failure is done. Working environment contains meeting room for discussing problem and it's solution. I have been given small room to do my work. All expectations from company was to help and guide me in project which they did.

Academic courses relevant to the project: Vibration analysis of chassis.

PS-II Station: Tega Industries, Kolkata

Faculty

Name: Arun Maity

Student

Name: SAPTARSHI CHAUDHURI(2018H1410153P)

Student Write-up

Short summary of work done during PS-II: I was allotted project on designing and implementation of Industry 4.0. As a part of Industry 4.0, we started with SCADA implementation and sensor mounting for efficiency of boiler. I identified the boiler sensor points to be installed and drawn the PI diagram with sensor mounting points. We are in talks with vendors for this implementation. Also, I studied compressors and drawn line diagrams to identify the sensor installation points. I was also allotted project on design and implementation of daily work management for which I prepared a format for DWM and steps for daily work management.

Tool used (Development tools - H/w, S/w): AUTOCADD, EXCEL, MS WORD.

Objectives of the project: DESIGN AND IMPLEMENTATION OF INDUSTRY 4.0.

Major learning outcomes: About industry 4.0, Daily work management.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: I am grateful to BITS Pilani for assigning me PS at Tega Industries and giving me the opportunity to work on Industry 4.0 design and implementation. However, I would like to humbly mention that had I been assigned work at Tega Industries more related to mechanical design I would have been able to contribute to my PS in a much better way utilizing my experience of over 7 years as a professional and the knowledge I gained as a higher degree student in BITS Pilani during my course.

Academic courses relevant to the project: NO COURSE AS THIS PROJECT IS NOT RELATED TO DESIGN ENGINEERING.

Name: SHUBHAM PARETA(2018H1410159P)

Student Write-up

Short summary of work done during PS-II: Problem definition-To implement Industry 4.0 (Industrial Internet of things) for digitalisation of plant operation and process at our plant for monitoring and improving operation efficiency of complete production system.

Methodology and data to be collected,

- To understand all the complete process right from raw material to finished product used in Tega industry (Dahej location).
- Understand the SOP used in different process as per customer requirement.
- Identify the control parameters which are involved in different process such as temperature, pressure, load etc.
- Collect process data (key performance indicator)) from machine such as energy, temperature, pressure, machine running hour, production details, plan vs actual, material weight etc which directly affects the performance of process and quality of a product. Collection of data is done by various electronic devices, controllers, PLCs, SCADA, automation systems, robotic systems.
- Whole structure will connect to LAN to send data over server and can visualize over IOT platform.
- * Time study of blasting machine to improve its utilization.
- * Study safety issues in Tega industries and suggest preventive actions.
- * Review paper writing on industry 4.0 .
- * Post covid 19 lock down strategy in Indian manufacturing sector.

Tool used (Development tools - H/w, S/w): I have not used any special tool. I have worked on Microsoft excel to some extent.

Objectives of the project: Problem definition-To implement Industry 4.0 (Industrial Internet of things) for digitalisation of plant operation and process at our plant for monitoring and improving operation efficiency of complete production system.

Major learning outcomes: 1-Got a chance to work on real life practical problem in industry.
2-Learn how in planned manner work is done in industry.
3-Learn how the parts which are used in mineral processing industry, bulk material handling industry such as mill liners, lifter bar, shell plate are made in tega industries.
4- Learn many things about automation and plc, scada.
5-Learn how time study is done in real life as I did time study of blasting machine.
6- I did the safety study of plant and now I could appreciate importance of safety.
7-Appreciate the importance of industry 4.0 because due to covid 19 lock down Indian manufacturing sector suffers a lot as we are not having work from home culture. Industry 4.0 is a one step towards automation, work from home culture.
8-Overall learning was good and it will definitely help me in future career growth.

Details of papers / patents: I simply made a report of my work in word format. I didn't focus on paper publishing patent filing.

Brief description of working environment, expectations from the company: 1-The working environment was quite good. Accommodation facility was nice in Tega dahej plant. Company has given accommodation on their expense so we need not to worry and money was also saved.
2-Behavior wise employs of company were all good including my guide also. I also made many friends there.
3- The only expense was for food so you can save money there also.
4-Working environment in company was very good. People were always there to answer our question. Being a Bitsian we got lot of respect in company premises.
5-Company was giving salary in covid 19 lock down also. Company takes care of human ethics.
6- Company is highly quality conscious and didn't compromise in terms of quality of product.
7-I was given well air conditioned room with a computer for project work and there was a canteen facility for lunch.
8- Everything was more than expected. They treated us like a regular employs.
9- Overall experience was very good.

10-I will suggest upcoming students to go there if they are allotted Tega industries Dahej. Their are opportunities to learn many things.

Academic courses relevant to the project: Robotics and Mechanical measurement and control.

PS-II Station: Tejas Networks, Bangalore

Faculty

Name: H. Viswanathan

Student

Name: CHILUKURI SRINIVAS HARSHA(2018H1230153G)

Student Write-up

Short summary of work done during PS-II: Designed products for high speed telecommunication by drawing schematics in DX designer tool, layout in Allegro physical drawer and got basic idea of the telecommunication products designed by Tejas networks previously. Learned about how to select IC parts for business purposes by carefully reading datasheets and the protocols using which IC's communicate with each other.

Tool used (Development tools - H/w, S/w): DX designer, Allegro physical view drawer, Databook, Dashboard, CVS Tortoise, Viewdraw, Linux.

Objectives of the project: Distribution of high speed traffic such as 100 GBPS speeds into 24 lanes of 1 GBPS and 8 lanes of 10 GBPS for stacking and uplink by programming speeds of lanes individually.

Major learning outcomes: Designing of schematics, layouts. Power calculations, Choosing of IC's by comparing, business etiquette.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Friendly environment with approachable and ready to help managers and mentors. Learn about electronics behind data distribution in telecommunications.

Academic courses relevant to the project: Yes but only to an extent.

Name: Muktha Padakandla(2018H1230164G)

Student Write-up

Short summary of work done during PS-II: The project was based on board design for muxponder / transponder application. The main components were chosen based on the speed and bandwidth requirements of the board. It consists of Processor, Optical modules, Control FPGA, timing device and other peripherals like power module and memories. Schematic is first drawn where we connect all the components. The layout of the board is made and sent for PCB manufacturing. Then a cold-test is performed on the finished board after which it is hardware debugged and various signals are checked by probing those signals. This task is called the board bring-up and is a very critical task for checking the proper functioning of the board, the various signal levels and the proper working of different protocols. My work involved mainly in the schematic design and design review along with the board bring up of another card. The board bring up involved the cost-test and voltage test along with Hardware Verification and Testing (HVT).

Tool used (Development tools - H/w, S/w): DxDesigner, Allegro physical viewer.

Objectives of the project: To design a muxponder / transponder board.

Major learning outcomes: Different networking protocols, fundamentals of schematics and board design.

Details of papers / patents: Datasheets of components- company confidential.

Brief description of working environment, expectations from the company: Tejas networks has a very friendly work environment. The colleagues in every level are very knowledgeable and friendly. They are always ready to help us with any problems we face. There is freedom to approach any person in the office to ask for any kind of help without the need to follow a hierarchical channel for communication. There is flexibility in timings hence, there never is any pressure in maintaining a strict schedule. Overall, it's a very friendly environment and the best one to kick start my career.

The company expects all its employees to perform their best and give their best. As an intern, I was always punctual and delivered my work on time. It was a fun learning experience as an intern, and in the full time, I would be given many major work and be an integral part of the company.

Academic courses relevant to the project: Networks and circuits, Reconfigurable computing.

Name: Susmita Pal(2018H1230165G)

Student Write-up

Short summary of work done during PS-II: In Tejas networks, I worked on implementation of a FIFO based UART for Console Logging. For implementation of above functionality, I used Verilog as HDL and then code compilation and synthesis is done. Then to test the functionality, I used few scripts. As we know STA is the most important part so lastly I did STA using TimeQuest Timing Analyzer.

Tool used (Development tools - H/w, S/w): QUARTUS (Time Quest) Timing Analyzer and Tejas internal tools.

Objectives of the project: To design a FIFO based UART which can be used to provide access to one card to capture the logs of other cards. These log files can be used to understand the cause of system failure.

Major learning outcomes: Understanding of FIFO, STA, UART and Verilog.

Details of papers / patents: Design documents and Programmers guide of the company.

Brief description of working environment, expectations from the company: Tejas networks has a very good working environment. My team has always been approachable whenever I was stuck at something.

Academic courses relevant to the project: Reconfigurable computing, VLSI design.

Name: Renuka Harishchandra Ramrakhiani(2018H1400122G)

Student Write-up

Short summary of work done during PS-II: Development of Wi-Fi access point (Embedded).

Tool used (Development tools - H/w, S/w): H/w - Access point, connectors S/w - C, linux, Nodejs.

Objectives of the project: To develop centralized management controller for controlling access points deployed in the field remotely without the need of physical presence at the deployment location.

Major learning outcomes: Networking terminologies, Tejas products, Wireless access point, C, coding standards, Testing tools, Linux commands, Software architecture, Cross compilation, Debugging in embedded devices.

Details of papers / patents: NA.

Brief Description of working environment, expectations from the company: Work culture is very good, good company to start career if interested in networking & communication, extensive set of classroom training provided for interns.

Academic courses relevant to the project: Networking embedded applications, C & C++ programming, Embedded system design, Device drivers.

Name: Surbhi Malani(2018H1400138G)

Student Write-up

Short summary of work done during PS-II: As an intern in Tejas networks, I got an opportunity to understand and implement the basic concept of networking and operating system. Questions were assigned to understand how the code is written in the industry level. For understanding the Tejas products, training session was organised. I was working for a feature, where date password is generated with the help of advanced encryption standard cryptography algorithm.

Tool used (Development tools - H/w, S/w): Bugzilla, Tejas internal simulator.

Objectives of the project: To support authentication, authorization and non-repudiation properties through an efficient password generation system implemented as an application that generates date dependent passwords using Advanced Encryption Standard (AES) algorithm.

Major learning outcomes:

1. Detailed study of cryptographic algorithms.
2. The existing techniques used to generate passwords (SALT technique, SSL).
3. Implementation of cryptography algorithm.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: In the organisation, there is learning environment and people are approachable and ready to answer our query. There is no time constraints. The basic understanding of programming language like C, C++ (in-depth knowledge of pointers) along with the basic concepts of networking.

Academic courses relevant to the project: Computer networks, Operating system, Device drivers.

PS-II Station: Texas Instruments (I) Pvt. Ltd.,-Systems, Bangalore

Faculty

Name: Satya Sudhakar Yedlapalli

Student

Name: AKHIL NORI(2016A3PS0106G)

Student Write-up

Short summary of work done during PS-II: A massive amount of data is collected during the operation of TI boards and chips for specific applications. This data often needs to be processed and / or visualised to help debug certain defects or confirm the correct working of the device. This project deals with the development of a software toolkit that enables engineers to directly visualise and modify output data from a device, stored in spreadsheet formats. Specifically, the application developed is very useful for pivot charting and aggregating data with custom functions.

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

Objectives of the project: To enable TI engineers to analyse large datasets quickly and efficiently, by building a software tool embedded in their in-house programming interface.

Major learning outcomes: Object oriented programming, API creation, Medical imaging data knowledge.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Regular office environment, with shared cubicles for interns. Senior members, mentors and co-workers are very helpful and approachable. The campus is well maintained, and has recreational activities as well. My manager expected consistent efforts from my side and a willingness to understand new system design. The company expects you to approach other employees to get the most out of your work.

Academic courses relevant to the project: Probability and statistics, Object oriented programming.

PS-II Station: Texas Instruments (I) Pvt. Ltd., -Analog , Bangalore

Faculty

Name: Satya Sudhakar Yedlapalli

Student

Name: ABHINAV S(2015B5A30490P)

Student Write-up

Short summary of work done during PS-II: My project was to measure PSRR and noise parameters of an LDO on an automatic test equipment. This process is usually done manually at the validation end. Automating it conserves valuable manpower and time. I was able to automate most of the process. The only issue was for low frequencies, below 500Hz, for which the proposed method did not work.

Tool used (Development tools - H/w, S/w): Automatic test equipment.

Objectives of the project: Measurement of PSRR and noise parameters of an LDO on an ATE (Automatic Test Equipment) and compare it with existing datasheet values.

Major learning outcomes: Basics of test and validation engineering.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: TI India is pretty lenient when it comes to work timings and prioritizes your comfort more than anything else. The only thing that is expected is to meet deadlines on time. Interns have a decent degree of freedom over how they can tackle a problem. It is also very easy to approach experts to get their opinions. Regular team meets ensure that interns are always aware of what the others in the team are working on, and how their goals align with those of the intern.

Academic courses relevant to the project: Analog and digital VLSI design, Analog electronics.

Name: Siddhant Laddha(2016A3PS0191P)

Student Write-up

Short summary of work done during PS-II: I was involved in bringing up a setup for USB 2.0 Protocol compliance. Basically, a setup which will be useful for emulating a USB 2.0 repeater configuration. This emulation leads the path to verify that the device is compliant to the standards as well as qualified for certification. This belongs to broad category of Design Verification and Validation an integral part of Design process for catching bugs early on and making changes to the design.

Tool used (Development tools - H/w, S/w): Cadence Virtuoso (Design simulation), Simvision (Debugging environment), Synplyfy Premier (Digital synthesis tool), Xilinx Vivado (FPGA vendor tool), Python (Seriously learn it, used to automate lots of tasks and saves a lot of time), Altium Suite (PCB design).

Objectives of the project: Measurement of Jitter with certain precision, accuracy and resolution using the existing equipments. If not feasible, provide new equipment specifications. Emulation platform bring-up for USB repeater configuration. Involves selecting the appropriate too.

Major learning outcomes: Non-technical (Because they matter)

Patience, Presentation and Soft skills.

Technical (Because they get the actual work done)

Understanding of fundamentals of electronic design, Quick revision of concepts taught in college especially Maths and Digital + analog electronics.

Details of papers / patents: 1. USB 2.0 standard specifications from USB-IF (usb.org).

2. Jitter specifications from JEDEC.

Brief description of working environment, expectations from the company: It was awesome!! Everyone is passionate about their job and help you out. If they don't know anything they clearly say that they don't know (a habit which we are never taught in college) and try to guide you to an appropriate resource. No comments are made without appropriate calculations which adds to the credibility to what they speak. They are quite welcoming. Only part that sucked about this PS2 was the COVID lock-down. I missed having conversations with my colleagues.

Academic courses relevant to the project: Digital design, Digital and analog VLSI design, Microelectronic circuits, Probability and statistics, Control systems, Signals and systems, Communication theory.

PS-II Station: Thornton Tomasetti, Mumbai

Faculty

Name: Mahesh K Hamirwasia

Student

Name: JHAVERI RONA KIRTIKUMAR(2018H1430036H)

Student Write-up

Short summary of work done during PS-II: Projects assigned are mostly multifaceted which involves reviewing shop drawings and submittals related to various components such as structural steelwork, reinforcement, post tensioning, lifts, building service equipment, masonry wall, shear wall, miscellaneous metals etc.

Coming to the work assigned in company, I'd reviewed couple of shop drawings related to concrete slab, stairs, concrete column, beams, foundations, shear wall, link beams, steel beams, steel columns, masonry etc. as per the TT standards and specifications mentioned in the ACI code. I'd been a part of DC team and reviewed shop drawings of various parts of Reinforced Concrete Structures like Concrete Beams, Columns, Foundations, Slab, Concrete Mix, Masonry, Concrete Cassions, Concrete Shear Wall etc. I'd also reviewed submittals related to Steel Structures such as Basics Parts like Steel Erection, Beams, Columns, Bracings, Steel Plate Girder, Gantry Girder, Trusses, Deck etc. and most importantly, I also worked on Shop Drawings Review of Pre-stressed Concrete Structures under Pre-tensioning as well as Post-Tensioning operation. I learnt various software's like Blue beam, ETABS, RAM, SAFE, REVIT etc. in PS station Thornton Tomasetti for reviewing Shop Drawings and submittals assigned by DC project team.

Tool used (Development tools - H/w, S/w): Blue beam, REVIT, AutoCAD, ETABS, SAFE, RAM etc.

Objectives of the project: To review the Shop Drawings and Submittals related to Concrete and Steel Structures under the assigned Project: Capital One Block A Building located at Mclean, USA.

Major learning outcomes: 1) Studied basics information required to review Shop Drawings and submittals. (Reference: Video Lectures from TT Website).

2) Studied structural set details as per the ACI code and understand carefully all the details mentioned in the code.

3) Studied various details such as Concrete Slab, Stairs, Concrete Column, Beams, Foundations, Shear Wall, Link Beams, Steel Beams, Steel Columns, Masonry etc. as per the TT standards and specifications mentioned in the ACI code.

4) Learnt shop drawings review of various parts of reinforced concrete structures like Concrete Beams, Columns, Foundations, Slab, Concrete Mix, Masonry, Concrete Cassions, Concrete Shear Wall etc.

- 5) Learnt shop drawings review of steel structures: Basics parts like steel erection, Beams, Columns, Bracings, Steel Plate Girder, Gantry Girder, Trusses, Deck etc.
- 6) Learnt Shop Drawings Review of Pre-stressed Concrete Structures under Pretensioning as well as Post-Tensioning operation.
- 7) Studied TT References: Shop Drawings Review and submittals of various structural elements like Beams, Slabs, Columns, Footings, Shear Wall, Pre-Stressed Concrete, Steel Structures etc. in detailed manner.
- 8) Studied the Core Studio Tools used for Revit, Tekla and other related software's which is required in my project to review shop drawings and submittals which has been assigned to me.
- 9) Learnt the software's required in order to study the shop drawings review & submittals like Bluebeam Revu, Revit, ETABS, RAM etc.
- 10) Studied the details about Bridge Deck Slab, T Beam Design, Post Tensioning Bridge Design etc. as per the ACI code.
- 11) Developed the Excel sheet: Structural analysis & Designing as per ACI code.

Details of papers / patents: 1) Reviewed shop drawings and submittals of Capital One Block A project related to Concrete and Steel structures.
2) Developed Excel sheet related to structure designing based on ACI codal provisions.

Brief description of working environment, expectations from the company: In Thornton Tomasetti, one can get work environment that is professionally stimulating, intellectually challenging and personally rewarding. In TT, one will always have the opportunity to work on several interesting projects and will really enjoy the workplace culture.

Academic courses relevant to the project: Advanced Structural Analysis & Design, Structural Dynamics & Earthquake Engineering, Advanced RCC & Steel Structures, Operation Research / Structure Optimization, Pre-stressed Concrete Structures, Bridge Engineering, Construction Management.

Name: RADHA RANI RAJPOOT(2018H1430057P)

Student Write-up

Short summary of work done during PS-II: I have worked on shop drawing reviews, modeling and designing of post tension slabs and shear walls, quantity estimation of link beams and shear walls for multi-story buildings.

Tool used (Development tools - H/w, S/w): Bluebeam, RAM concept, CSIcol, Sconcrete, AutoCAD, Etabs, Revit, Microsoft excel.

Objectives of the project: Design Development and Construction Administration of Multi-Story Buildings.

Major learning outcomes: Developed concepts for designing and detailing of reinforced concrete structures and also got an idea of designing economic post tension slabs.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Company offers a very friendly as well as flexible working environment.

Academic courses relevant to the project: Design of Reinforced Concrete Structures, Design of multi-storied structures.

PS-II Station: Timetooth, Noida

Faculty

Name: Nithin Tom Mathew

Brief write-up on each PS-II station: The core strength of TimeTooth is its high quality of engineering modeling and simulations support for product development. The services can be leveraged by clients in product conceptualization, prediction / validation of performance, abuse situation study or field issue resolution. Timetooth uses a selection of industry standard COTS simulation software, as well as a rich library of proprietary software codes and customized open

source solutions. TimeTooth boldly offers the challenging outcome based business model for this service, where the responsibility of the product performance is also jointly owned by Timetooth and the client. Projects are executed by the team under the safe guidance of Timetooth specialists to quickly gain confidence, develop and validate your own proprietary processes, and maximally utilize your investment in CAE hardware and software. In addition, robust knowledge retention processes are taught so that these hard learned skills stay within the organization through the vicissitudes of time. Timetooth also offers to execute custom automation of design / CAE processes. The custom software can be built to automate and link a larger set of computer aided product development processes across various commercial software platforms, statistical tools, material / component databases and physical testing data. The students should be equipped with various analysis software. The concepts on fluid dynamics, CFD, etc would be helpful.

PS-II Station: Toshiba Software (India) Pvt. Ltd., Bangalore

Faculty

Name: Sonika Chandrakant Rathi

Student

Name: K Likhitha(2018H1030069G)

Student Write-up

Short summary of work done during PS-II: Implementation of a tiny firmware.

Tool used (Development tools - H/w, S/w): Astah professional, Astah community, Source insight.

Objectives of the project: Preparation of SRS, SDS, TD and the code and finish testing.

Major learning outcomes: Preparation of SRS, SDS and TD which would be helpful in the long run.

Details of papers / patents: NA

Brief description of working environment, expectations from the company: Work environment is good. A strict 9 hrs is a must for work but no offc work is carried home so we can have a good work life balance.

Academic courses relevant to the project: C programming, DSTN, Embedded systems.

PS-II Station: Toshiba Software (India) Pvt. Ltd., Pune

Faculty

Name: Sonika Chandrakant Rathi

Student

Name: Anjana(2018H1030054G)

Student Write-up

Short summary of work done during PS-II: NVM express is an open source specification for accessing non-volatile memory storage devices connected through PCI express bus. NVMe driver is an open source device driver to communicate with storage devices. Efficiency is a well known parameter for storage devices. NVMe provides a specific storage region for hosts which is known as controller memory buffer which is used for general purpose read and write. Hosts can create task queues in the CMB region to reduce latency. Theoretically, CMB is to reduce latency but when organizations approach customers with this feature they have to provide a practical proof of improved latency for read/write operations. NVMe device drivers don't provide practical proof of concept. How organizations provide proof of performance to clients ? Organizations need to develop their own custom feature for drivers to accommodate their needs. CMB related features will provide metrics for improved performance so that customers can see real time improved performance of their storage devices.

Tool used (Development tools - H/w, S/w): C language, NVMe CLI, SVN versioning tool, RedMine, FIO monitoring tool.

Objectives of the project: Design feature for moving data from host memory to CMB region for better performance.

Major learning outcomes: Got to learn latest storage technologies. Hands on experience with industry work environment.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: My expectations for the company would be to provide a work environment in which I can contribute to the team, I receive appreciation for my contributions, I have job stability and the ability to grow with the company. Toshiba is an excellent company to work with. Productive and good workspace.

Academic courses relevant to the project: Computer architecture, Data structures.

PS-II Station: UBS Business Solutions (India) Private Limited - Finance Group, Mumbai

Faculty

Name: Bandi Venkata Prasad

Student

Name: D MUKESH REDDY(2016A1PS0697H)

Student Write-up

Short summary of work done during PS-II: My work at this firm was about independent price verification of financial instruments for valuations control services at the firm. we have monthly

tasks to perform at the end of the month and we work mainly in microsoft excel and a reporting platform my work was mainly analysis and reporting.

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

Objectives of the project: The objective of the project was to know about valuation techniques and reporting.

Major learning outcomes: I had learned advanced excel in the course of the project and had a good exposure to the the different financial concepts.

Details of papers / patents: I didn't had any papers and patents during my internship.

Brief description of working environment, expectations from the company: I had a good experience at the firm but it didn't last for long time because of present covid 19 situation. As long as I worked at firm working environment was great had a great experience my colleagues were very good to me they have taken good care of because of me coming from college and this is first time working in any firm and they were open for my doubts if any.

Academic courses relevant to the project: YES.

Name: KADAM ROHAN RAJESHWAR(2016A5PS0336P)

Student Write-up

Short summary of work done during PS-II: Post allotted to me is of valuations controller. Work area includes bonds and derivatives traded in Asia-Pacigic region. Have been doing process automation as well.

Tool used (Development tools - H/w, S/w): Bloomberg, Murex, Reuters, Anaconda.

Objectives of the project: Automation of valuation control processes using Python programming language.

Major Learning Outcomes: Bonds and derivatives, introduction to trading markets, learned to make graphical user interfaces.

Details of Papers/patents: 2 proceeds I automated are due validation.

Brief Description of working environment, expectations from the company: Good work-life balance, cooperative colleagues.

Academic courses relevant to the project: Derivatives and risk management, Introduction to programming.

Name: CHAURASIA AKSHAT(2016B1PS0710H)

Student Write-up

Short summary of work done during PS-II: During my tenure of working with Valuations Control. I worked on creating Python scripts that helped my team to conduct data analysis and perform "independent price verification" on the basis of monthly data provided by trading desks. Each month, we received data from traders of the company and were required to perform several kinds of analysis and auditing of the data. We would then highlight the important parts and present it to the traders. To perform this, we used a combination of Excel, Python and VBA scripts along with many internal softwares designed specifically for our work.

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

Objectives of the project: Writing automation scripts for data analysis.

Major learning outcomes: Programming, scripting, financial markets.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The working environment is very compatible and open to ideas from interns. It all depends on the ambitions and motivation of the trainee. The work is generally divided in two parts wherein 2 weeks per month are spent on preparation and the rest 2 weeks are performance (independent price verification - valuations control).

Academic courses relevant to the project: FOFA, DRM.

PS-II Station: UBS Business Solutions (India) Private Limited - Group Operations , Pune

Faculty

Name: Bandi Venkata Prasad

Student

Name: AKSHIT GAUR(2016A1PS0882H)

Student Write-up

Short summary of work done during PS-II: I was allotted RAS - Group reporting. I was a member of Internal Reporting Team (IRT). I was involved in the daily IRT activities like data reconciliation, offline loading and monthly and quarterly reporting.

Tool used (Development tools - H/w, S/w): MS excel, IBM cognos TM1.

Objectives of the project: Learn BaU activities of IRT.

Major learning outcomes: Technical knowledge of MS excel, monthly and quarterly financial reporting experience.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: UBS, Pune provides a desktop and a headset. Most of the work is done on MS excel.

Academic courses relevant to the project: Finance courses (just MS excel knowledge is required).

Name: Sangam(2016D2PS0990P)

Student Write-up

Short summary of work done during PS-II: In this internship, I work on SAP tool which is very effective for my future. I learnt lots of things from this internship also I improved my soft skills. In UBS, I do daily basis activities.

Tool used (Development tools - H/w, S/w): SAP tool, Microsoft excel.

Objectives of the project: Financial data service and control of single cost ledger.

Major learning outcomes: Microsoft excel, UBS tool, SAP tool.

Details of papers / patents: No patents.

Brief description of working environment, expectations from the company: Working environment is very good, UBS provide lots of facilities for us and we have good learning resources from UBS, expectation from the UBS is only good communication skills and also you need to know about microsoft excel.

Academic courses relevant to the project: Principal of economics.

PS-II Station: Udaan, Bangalore

Faculty

Name: Annapoorna Gopal

Student

Name: MANAS BANSAL(2015B2A10783H)

Student Write-up

Short summary of work done during PS-II: • Built the catalogue from 0 to 1 for enterprise website for Udaan, in the B2B space.

- Created the structure of categories and verticals for the e-commerce, along with attributes and listings.
- Working with business, technology and catalog teams as a SPOC.
- Collaborated with yellow messenger to build a chatbot, did extensive user testing with product improvements in UI/UX.

Tool used (Development tools - H/w, S/w): MySQL, Sprinle data, MS excel, Google sheets.

Objectives of the project: Build catalogue for enterprise website.

Major learning outcomes: B2B functioning, Enterprise functioning, Procurement, Cataloging, Category management.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Fast paced working environment, ideal for a self-starter. Company expects you to get the work done, you can approach your colleagues for any help.

Academic courses relevant to the project: Principles of management.

Name: VUSIRIKALA VARUN(2016A4PS0304G)

Student Write-up

Short summary of work done during PS-II: Work mainly involves making dashboards and views for data analysis. Sometimes callouts were given based on the analysed data.

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

Objectives of the project: To increase the efficiency of ground level activities and devising new strategies or plans to boost sales.

Major learning outcomes: Business development, SQL, Python, Excel.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment was quite good. The team members or other employees were very helpful. Necessary training was given for a week to get us familiarized with the company structure, working and tools that are used.

Academic courses relevant to the project: Data base management system

Name: PRACHI SINGH(2016A5PS0752H)

Student Write-up

Short summary of work done during PS-II: Udaan is a trading platform catering to SMEs in India and follows a B2B model. It is spread across many categories like Clothing, Electronics, Food, FMCG, Fresh, Home & Kitchen, Pharma, etc. My work here dealt with credit and

business compliance along with handling operations which helped in the development of pharma category.

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

Objectives of the project: Manage KYC, business verification and new buyer on-boarding of pharma buyers. SOP modifications and developing new processes for the same.

Major learning outcomes: Gained technical knowledge of advanced excel, SQL and it's application in solving the daily problems arising in the company. Developed various interpersonal skills like leadership, relationship management, teamwork, time management, etc.

Details of papers / patents: Not applicable.

Brief description of working environment, expectations from the company: The working environment at Udaan is demanding, challenging and fast-paced. The company being a start-up in it's growth phase expects the individual to deliver good solutions under immense pressure at times. Having said that, it is a very good starting point for any fresher with an interest in the B2B space.

Academic courses relevant to the project: Forensic pharmacy.

Name: Rohit R Nair(2018H1420199P)

Student Write-up

Short summary of work done during PS-II: The internship taught me the importance of supply chain finance and how it can be tailored for any market to remove the uncertainties associated with the supply chain. The SaaS platform of Udaan integrates the technology with supply chain and makes it easier for the company to onboard buyers cheaply and conveniently. The SaaS based system of Udaan incorporates education, training programs and customer service. The key take away of this practice school have been the way a corporate environment works and

how all the departments of a supply chain organization functions. The fast-paced environment of a growing unicorn startup also taught me how data-based decision makings are done and how it is being leveraged by companies to improve their performance. Working in the operations trained me to deal with various levels of executives and to manage them effectively. Soft skills like electronic mails, video conference calls and corporate meetings were daily part of this practice school and have instilled confidence in me. On the technical side, the internship educated me in working with large amount of data and analyzing it for decision making. Softwares like SQL, Python and Microsoft excel were used extensively during the period and taught me the skills of presenting useful insights from data.

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

Objectives of the project: Operations and Process excellence.

Major learning outcomes: Supply chain finance, Process improvement and people management.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Good work-life balance, supporting mentors and co-workers.

Academic courses relevant to the project: Supply chain management and operations management.

PS-II Station: UPGRAD, Mumbai

Faculty

Name: Swarna Chaudhary

Student

Name: DHARAP MIHIR SACHIN(2016A3PS0143P)

Student Write-up

Short summary of work done during PS-II: Redevelopment of product management program. Worked on the assessments, assignments, post production scripts, shooting of new content with latest industry examples and case studies, student and grader rubrics, etc.

Tool used (Development tools - H/w, S/w): Google docs, Google slides, Google sheets.

Objectives of the project: Redevelopment of product management program.

Major learning outcomes: Understanding about product management. Networking with leaders in the product domain. Working in teams.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Good team culture. Work hours are 9 hours per day, but may extend.

Academic courses relevant to the project: None.

PS-II Station: UST Global- Chennai, Chennai

Faculty

Name: Sindhu S

Student

Name: S A HARIDHAKSHINI(2015B4A70567H)

Student Write-up

Short summary of work done during PS-II: Digitization of various operations in the plant as a part of continuous improvement activities of a plant by using IOT to improve the effectiveness of the operations (Quality and productivity).

Tool used (Development tools - H/w, S/w): Arduino, Node red, Proteus, OLED, UART, MQTT.

Objectives of the project: Monitoring environment using sensor is to keep the clean room sterile. This is used to monitor temperature, humidity and particle count at the standards proposed.

Major learning outcomes: Got skilled in Arduino programming and learnt about various hardware devices.

Details of papers / patents: NIL.

Brief description of working environment, expectations from the company: The internship opportunity I had at UST Global-Chennai was a great chance for learning and professional development. I am grateful for having a chance to meet so many wonderful people and professionals who led me through this internship period. My managers and project mentors motivated me and helped me a lot in understanding the concepts and clearing my doubts. I choose this moment to acknowledge his contribution gratefully. I perceive this opportunity as a big milestone in my career development. I will strive to use these gained skills and knowledge in the best possible way to attain desired career objectives.

Academic courses relevant to the project: C programming, Operating systems, Microprocessors, Digital design.

PS-II Station: UST Global Infinity Labs-Robotics, Thiruvananthapuram

Faculty

Name: Sindhu S

Student

Name: ANANTHA NISHANTH REDDY(2012B1A80742H)

Student Write-up

Short summary of work done during PS-II: My project was related to the data science domain, where I was working with the team to clean and recreate the data so as to understand and derive various insights from it. Then, we had to test various databases and they create api's so that the backend code which we have created will be able to communicate with the front end.

Tool used (Development tools - H/w, S/w): Python, Spark, Cassandra, R, Angular.

Objectives of the project: To work on data to create meaningful solutions.

Major learning outcomes: Understad the basics of data science and work with all the big data tools available.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: I was able to work in a comfortable and relaxed environment, my mentors were very patient with us in initially and gave us time to catch up with them before we started working on the project. There are also a lot of people with similar curiosity and will to learn.

Academic courses relevant to the project: Ubuntu usage in the 1st year programming course.

PS-II Station: Visteon Corporation, Pune

Faculty

Name: Srinivas Kota

Student

Name: Taranvir Singh Bhullar(2018H1410112G)

Student Write-up

Short summary of work done during PS-II: Due to the major temperature difference between the inner cabin and the outer environment of the two-wheeler instrument cluster, there will be visible condensation on the inner side of the lens, giving rise to a white patch. This results in obstructing visibility and is commonly observed in the cluster which is directly exposed to the outer environment. To avoid condensation, an anti-fog layer is applied on the inner side of the lens. After a certain amount of water absorption, the delamination of a layer from the glass (PMMA) substrate occurs leading to the formation of a white patch. The current study proposes a method to avoid the condensation of water vapor by reducing its concentration in the cluster, with the help of proper air circulation using air vents placed at different heights on the lower surface of the instrument cluster. For the purpose of study, instrument cluster prototype has been taken and the computational analysis of the same is presented.

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

Objectives of the project: To study the air flow inside the instrument cluster.

Major learning outcomes: Learned about the practical use of computational fluid dynamics for studying air circulation inside the cluster.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is good and encourage to do research and development. Company expected to be punctual, dedicated towards their work.

Academic courses relevant to the project: Computational fluid dynamics, Heat mass transfer.

Name: P ALEN THOMAS(2018H1410134H)

Student Write-up

Short summary of work done during PS-II: The internship in Visteon corporation was after the campus placement in the company, so the internship was mainly focused on training sessions in CAE team. The internship started with weekly information gathering and presentations on topics like design of plastic members, failure theories, vibration analysis and basics of meshing. Later on extensive training sessions on Altair Simlab was carried out. Two live projects of ford motors were executed at the end of the training.

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

Objectives of the project: Design analysis of automobile cluster.

Major learning outcomes: A clear understanding on design of Automobile clusters its meshing and analysis.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment at Visteon was very professional. All the employees were very punctual and disciplined. A student intern is also expected to be punctual and disciplined. The task submissions are expected to be on time.

Academic courses relevant to the project: Finite element analysis, product design, theory of plasticity.

Name: Shreesh N(2018H1410200G)

Student Write-up

Short summary of work done during PS-II: Project on Optics and Illumination department. Project on definition of cluster mounting angle to avoid sunlight reflection in two wheelers. Knowledge of instrument clusters, LCDs and LED lights were acquired. Optical analysis and ray tracing using required software were done.

Tool used (Development tools - H/w, S/w): Light tools, CATIA, AutoCAD.

Objectives of the project: To define the cluster mounting angle to avoid sunlight reflection on LCDs in two wheelers.

Major learning outcomes: 1. Basic Knowledge of optics and illumination.
2. Knowledge of problems faced in instrument clusters.
3. Knowledge of softwares like light tools.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: The company maintains a good work life balance. It has extended timings. The managers are humble and shows interest and attends the problems faced during the project. They expect our interest in the project than the results achieved by us. Discipline and good professional behaviour is expected by us.

Academic courses relevant to the project: 1. CAD/CAM 2. Micro electro mechanical systems
3. Engineering physics 4. CATIA.

PS-II Station: VMS (Vakil Mehta Seth) Consultants Private Limited, Mumbai

Faculty

Name: Mahesh K Hamirwasia

Student

Name: KONDRAGUNTA RAMAKRISHNA(2018H1430056P)

Student Write-up

Short summary of work done during PS-II: The project involves analysis and design of a multistory residential building in Mumbai as per Indian codes like IS-456:2000, IS-875 Part-1, IS- 875 Part-2, IS- 875 Part-3, IS-1893 Part-1:2016, IS 13920-2016 and BIS guidelines. The solution was chosen such that it provided the most efficient sections in terms of structural dimensions, materials etc. The proposed building consists of basements, lower ground floor, upper ground floor, 1st to 6th, 8th to 13th, 15th to 20th & 21st to 32nd typical living floors, 7th, 14th, 21st & 28th are refuge floors. One fire-check floor, service floor & terrace floor. Total no. of suspended floors are 37. To simulate the structure so as to get accurate behavior, the structure was modelled as a three dimensional concrete structure in Etabs. After modelling analysing and designing is done. Foundation design is done using RCDC.

Tool used (Development tools - H/w, S/w): ETABS, STAAD.Pro, RCDC, MS Excel.

Objectives of the project: Conceptualizing structural layouts and producing very detailed, international quality design drawings for easy execution at the site after designing in a detailed and effective way.

Major learning outcomes: The program introduced me to the field of "Concrete structures". Enhanced my skills of modelling, analyzing and designing an efficient and optimized engineering structure. Exposed me to current practices followed in a design office like performing quick and accurate hand calculations, effectively using the standard empirical charts,

coefficients, spread sheets and various national and international standards. Opportunity to get hands on experience of FEM based commercial software packages like ETABS, STAAD Pro.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: VMS is a small firm in terms of employee numbers but large in terms of excelling in fundamentals of structural engineering bringing with it more than 60 years of experience in structural design. It is one of the few firms having representation in BIS code committees. The firm is a perfect place for freshers as it allows them to work on real world problems from day 1. The seniors are very cooperative and always ready to help. The top management makes sure that the interns are introduced to the challenges of the design office with a smooth gradient.

Academic courses relevant to the project: Design of multi-storey structures, Earthquake engineering, Dynamics of structures, Concrete structures.

Name: SUSMITHA RAJENDRAN(2018H1430062P)

Student Write-up

Short summary of work done during PS-II: • Familiarization of various codes such as IS 875 part 2 and 3, IS 1893-16 part 1, IS 13920, IS 456-2000, IS 16700 (tall building).

- Overview of detailing of column, beam, slab.
- Test on codes.
- Analysis and design of one way and two way slabs, beams, columns manually, assessment of drawings.
- Familiarizing software (STAAD Pro).
- Manual designing of various components, ETABS learning session, verification of detailing of ongoing projects.
- Worked on excel sheet for tall RCC chimney.
- Design of retaining wall for an ongoing project, design of footings, ETABS modeling, class on design of water tank, design of industrial structure.

- Modeling of RC structure and its analysis design using ETABS.
- Design and analysis of structural elements.
- Checking the drawings and verifying those for approval.
- Steel related work in which design of angle section in a cantilever supported system and its complete design and drawing, design of composite structure to hold up the lift in an ongoing project etc.
- Familiarizing real life or practical issues which we are facing in site.

Tool used (Development tools - H/w, S/w): ETABS, STAAD Pro, Microsoft excel.

Objectives of the project: Design and analysis of an industry.

Major learning outcomes: To familiarize real life or practical issues which we are facing in site.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: They are very helping and supportive.

Academic courses relevant to the project: Design of steel structures, RCC, Composite.

PS-II Station: VMware Software India Pvt. Ltd., Bangalore

Faculty

Name: Chandra Shekar R K

Student

Name: ABHILASH NEOG(2016A7PS0004P)

Student Write-up

Short summary of work done during PS-II: 1. Developed a microservice-like solution for VMware's workspace ONE (an enterprise management system) cloud platform to deploy workspace ONE UEM (a device-management software - part of the enterprise software) console data to the platform. Mainly back-end work - developing rest apis, writing service classes, unit testing, etc. Done using spring boot.

2. Worked on one of workspace ONE's live projects. Developed certain api services and functionalities for authentication access, authentication mode, etc for a certain component of the project. Work was similar - using spring boot.

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

Objectives of the project: To develop an efficient back-end solution for the deployment of android enterprise app data on VMware workspace ONE cloud platform.

Major learning outcomes: Back-end web development, Spring Boot, JAVA 8, Git.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work environment is motivating and overall really good. Not much pressure of work; work timings are very flexible and people around are really helpful. Expectations from project - project can vary from team to team (also from office to office). One can end up with a full-fledged project, with lots of new tech and interesting tasks. But, also possible that you may not get a proper project (or as per your interests). Similarly, work load also depends on the team one ends up with. Projects can vary from research to development work, with the latter having the higher probability.

Academic courses relevant to the project: OOP (Mainly Java programming).

Name: ABHILASH NEOG(2016A7PS0004P)

Student Write-up

Short summary of work done during PS-II: I worked on 2 different projects during the internship. The first project was to develop a solution (microservice-like) for UEM (A unified endpoint management software) data deployment in WS1 (Workspace ONE) cloud platform. It was a stand-alone project developed from scratch. My role in the project was to develop the backend, which was done using Spring Boot f/w. The work mainly involved firing and handling UEM API responses, developing REST APIs, writing service layer classes and performing unit testing.

The second project involved specific developmental tasks within an ongoing WS1 Cloud project. It required working on a small portion of a live project on the cloud platform. The task was to enable device enrolment vIDM (VMware Identity Manager) mode from WS1 cloud. The work involved writing API clients, service classes to communicate with the UEM system and performing unit testing. Spring Boot was used for this.

Tool used (Development tools - H/w, S/w): Spring Boot, Java 8, Git, Angular.

Objectives of the project: To build efficient solutions in VMware's Workspace ONE Cloud platform to communicate with the UEM (Unified Endpoint Management) module of Workspace ONE software.

Major learning outcomes: Web-development (majorly back-end work), Spring Boot F/W, JAVA 8, Git, Performing unit testing.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The company has a nice work environment. People are helpful, not much stress of work, timings are flexible, and overall the environment is quite motivating. Proper training (depends upon the office one ends up in - there are multiple offices in Bangalore) is given before start of project work with multiple assignments and a mini-project.

Regarding projects, it depends majorly upon the team one ends up in (and also, sometimes the office). Can expect project ranging from development (tech - angular, spring boot, c#, js) to research oriented (common tech/topics - c, containerization / virtualization, OS, linux). One may or may not get a single full-fledged project to work for 6 months, rather multiple mini-projects, or task-based work.

Academic courses relevant to the project: OOP (mainly Java programming).

Name: BHANARKAR SHAUNAK ANIL(2016A7PS0029G)

Student Write-up

Short summary of work done during PS-II: 1. R&D on container migration.
2. Java project on refactoring the code.

Tool used (Development tools - H/w, S/w): 1. Kubernetes, Docker, CRIU.
2. Java, Eclipse, Perforce.

Objectives of the project: To find techniques of container migration.

Major Learning Outcomes: Learning about virtualisation, cloud computing, VMware products, containerisation, migration.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Work environment is very nice, the company policies and everything is quite flexible.

Academic courses relevant to the project: Computer network, OS, OOP.

Name: GARVIT JAIN(2016A7PS0080H)

Student Write-up

Short summary of work done during PS-II: The aim of the project was to provide software based distributed persistence to volatile memory so as to provide an alternative to NVDIMM. My

work involved writing APIs in C and C++ to change the boot process in order to enable persistence in volatile memory. My work also involved understanding VM crashes and comprehending the error messages by looking at dump logs or by using gdb.

Tool used (Development tools - H/w, S/w): C, C++, gdb.

Objectives of the project: To provide software based distributed persistence to volatile memory (RAM).

Major learning outcomes: Core kernel calls, File systems, Memory management.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The environment at the company is very good with employees from different teams accessible to provide their expertise on a diverse range of topics that the internship work may require. The company is very big and expectations are likely to widely differ across teams. My team expected to me to be regular and have basic knowledge on C programming and memory management.

Academic courses relevant to the project: Operating systems, C programming.

Name: VAIBHAV KUMAR TYAGI(2016A7PS0141H)

Student Write-up

Short summary of work done during PS-II: Project 1:HCX link visualization

The project comprised of understanding the products being used in the company. Then add a new web application into the existing framework to improve the accessibility of the data present. In the project, we first identified the new data to be processed and delivered to the front end. Requiring the creation of new APIs and database calls. Further, the creation of a better UI interface to display the connecting network in a visual manner. The primary point of research is

to figure out the placement algorithm for the graph drawing as every network configuration is possible, which was addressed by using dynamic force-controlled graphing.

Project 2: Making scripts to automate a new licensing structure

Originally the project was a research project to figure the best way to get the information from a number of hosts with limited access. After figuring it out I had to create a ship-able script to do the same automatically.

Project 3: Minor UI update requested by another team to add new elements to existing UI.

Tool used (Development tools - H/w, S/w): Java, NodeJS, D3, Python, Selenium, Typescript, Mongo DB.

Objectives of the project: Add new produce to the WebUI to assist with network visuilation.

Major learning outcomes: Learned to function in proper corporate climate. As well as remote working.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment was helpful and friendly. The workload was lighter then expected, remote working was smooth and streamline. Team was very helpful, and project details were clear. Access to company resources was easy and free. Development and testing tool were provided, problem solving teams assisted with any issue in relation to workspace and information.

Academic courses relevant to the project: DSA, Software development, Networking.

PS-II Station: Vuclip India Pvt. Ltd., Pune

Faculty

Name: Chetana Anoop Gavankar g

Student

Name: VIBHOR TAYAL(2016A3PS0154G)

Student Write-up

Short summary of work done during PS-II: I was a part of content engineering team which takes care of the flow of the content from the initial ingestion to the final delivery of the content on the Viu platform. My task was to develop features for the content management system and moments tool. These features improved the user experience. The technologies used for these features included Java, Google cloud, Python, React and Redux.

Tool used (Development tools - H/w, S/w): The technologies used for these features included Java, Google Cloud, Python, React and Redux.

Objectives of the project: Improvements in CMS and moments tool for user experience enhancements.

Major learning outcomes: I have gained new knowledge, skills and technical expertise in working with many cloud technologies. Before the start of this internship, I had worked on only Front-end technologies and had limited industry experience. I wanted to explore various Back-end technologies and wanted to understand the full software development life cycle. In the non-technical learnings, I learnt how to share knowledge with our teammates and also gain knowledge from them effectively. I got a first-hand experience of collaboration across multiple team members for completing a task. I also learnt multi-tasking when I had to work on different tasks with similar deadlines.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment was very collaborative with small team sizes. My expectations were to get nice industry experience and learning new technologies.

Academic courses relevant to the project: Computer programming, DBMS, Web development.

Name: TOTLA YASH VINOD(2016A3PS0181G)

Student Write-up

Short summary of work done during PS-II: I worked on several projects that involved knowledge graphs, video intelligence, web scraping and crawling, analysis of sequential data, predictive modeling, taste clusters. The projects covered several aspects of applied data science.

Tool used (Development tools - H/w, S/w): Python, SQL, CQL, Tensorflow, Neo4j, Google cloud platform, Tableau, Memgraph, JavaScript, HTML, CSS, Flask.

Objectives of the project: Data science, Data engineering, Business insights, Consumer insights.

Major learning outcomes: Big data, Cloud computing, Cloud architecture, Scalable algorithms and systems, Data mining, Data modeling.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Vuclip is a mid-sized company, so I found myself working closely with the technical directors of the company. They have a very startup like work culture and a very modern technical stack. They expect you to take ownership of the work and deliver like a full time employee. My ideas were welcome, my solutions were discussed and critiqued. I got timely reviews and regular feedback for my work.

Academic courses relevant to the project: Machine learning, Neural networks and Fuzzy logic, Computer programming, Operating systems, Software development for portable devices.

Name: VAIBHAV SINGH N RAWAT(2016A4PS0221G)

Student Write-up

Short summary of work done during PS-II: The work focussed on frontend web development and maintenance of viu.com.

Tool used (Development tools - H/w, S/w): S/w - Javascript, React, Redux, VS Code, Bitbucket, Harness.

Objectives of the project: Frontend web development.

Major learning outcomes: Understanding the processes and hurdles to create new features and fix existing ones.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment in the company is quite good. I found huge skill gaps between team members but there are efforts within the team to close this gap. Teams are provided at random but learning opportunities are vast in every team.

Academic courses relevant to the project: None.

PS-II Station: Wabco India Pvt. Ltd., Chennai

Faculty

Name: Venkataraman P.B

Student

Name: K V AMRITH ASHWIN(2018H1060160H)

Student Write-up

Short summary of work done during PS-II: I worked here in WABCO technology centre (WTCI), Porur, Chennai. I was assigned with the project on valve modeling of modular braking system platform 2.0. My work was to understand the functioning of brake signal transmitter, axle pressure control valve, central module and axle modulator and model the system, using mathematical modeling approach and black box modeling (using neural network and system identification) approach. The system modeling will help to identify the system behaviour under various operating conditions.

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

Objectives of the project: Valve modeling of MBSP 2.0.

Major learning outcomes: Mathematical modeling approach and Black box modeling of the system.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment was good. Mentors and co- mentors were really helpful and guided along the right path.

Academic courses relevant to the project: Fluid dynamics.

Name: JIWANANI GAURAVKUMAR LAXMANDAS(2018H1060178H)

Student Write-up

Short summary of work done during PS-II: Project was focused on building proof of concept for Automatic Tire Inflation System (ATIS) for commercial vehicles. It gave detailed understanding of steps to be followed for development of new product starting from concept creation to final design. Firstly, WABCO's product OptiTire was studied which is used for tire pressure monitoring and it was noticed as well as specified by the OEMs there is need to develop the automatic tire Inflation system. Field visit to Bharat Benz service station was carried and different kind of axle arrangements were studied. Pneumatic circuit was developed for fulfilling the purpose of inflation and configuration of the components to be included in the product was visualized by means CAD models in Creo parametric. Importance of bearings and sealing elements were understood and final proof of concept was proposed with CAD model.

Tool used (Development tools - H/w, S/w): Software used: Creo parametric, PneuDraw, Microsoft office, Matlab.

Objectives of the project: The concrete objective of the project was to develop proof of concept for Automatic Tire Inflation System (ATIS) suitable for commercial vehicles which would enable automatic and continuous regulation of pressure in all the tires.

Major learning outcomes: 1.Learnt the steps that are to be followed for the development of new product starting from concept creation to the final design.

2. Importance of concept generation and concept selection was studied.

3.Connection between dynamic and static parts was evaluated and suitable bearing and sealing elements were selected.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: My department was R&D where I was provided with all the sufficient resources needed for the completion of my projects. My mentor and co-mentor were quite helpful. As I was new to the automotive sector, they arranged an visit for the detailed understanding of the truck body. I had weekly pre-set

targets which were evaluated at the end of week by the team-lead. Environment was enthusiastic which always helped me in my work.

Academic courses relevant to the project: Automobile engineering, Fluid power systems (pneumatic systems), Machine design.



PS-II Station: Walmart Global Technology Services, Bangalore

Faculty

Name: Vimal S P

Student

Name: ADHITYA MAMALLAN(2016A7PS0028P)

Student Write-up

Short summary of work done during PS-II: Walmart's international markdown pricing team works on developing ML based solutions for price prediction during markdown periods. As part of this team, I worked on model governance dashboards used by our team for deeper insights on model performance. The dashboards were even used by Walmart store and area managers for a quick high-level view of the model performance. Aside from that, I also helped with data exploration and deep dive tasks for data from new markets (before preparing to deploy the model there).

Tool used (Development tools - H/w, S/w): Remote distributed clusters, Hadoop, HDFS, Hive, PySpark, Dash, Plotly, R Shiny.

Objectives of the project: To develop model governance dashboards for developers and business executives.

Major learning outcomes: Big data, Cluster computing, Regression algorithms.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is very open and friendly and my coworkers were very approachable. You are encouraged to take up work that you find interesting. As for the learning curve, other than the first few weeks picking up PySpark and first dealing with big data, it was negligible, and I found my coworkers to be very helpful whenever I approached them for doubts. The office setting is very liberal, with a fully stocked pantry and a nap room among other amenities. Work timings are also flexible, with the option to work from home if you want to. Overall, it is a very enjoyable place to work at and learn.

Academic courses relevant to the project: OOP, Data structures and algorithms, Information retrieval, Machine learning, Neural networks and Fuzzy logic.

Name: PULISHETTY ROSHINI(2016A7PS0076H)

Student Write-up

Short summary of work done during PS-II: RADD (Rapid Application Development and Deployment) is a platform that supports to deploy applications with ease. It connects to desired data sources and provides different widgets to analyse. And follows strategies to deliver applications at scale. I have added a configuration to RADD (only middleware) and APACHE SOLR (data source) connector. I have worked on tests such as performance and integration tests. Tasks included caching, promotion to different environments, databases related, POCs and bug fixes.

Tool used (Development tools - H/w, S/w): IntelliJ, Java, Spring boot, REST, DBeaver, Postman, Looper, Jenkins, Visual Studio, React, Mockito & Junit.

Objectives of the project: Develop and maintain a platform that hosts applications (Team project).

Major learning outcomes: Write clean, maintainable code; Unit, integration and performance testing; Software development principles; Agile software process; CI/CD pipelines; Components used within the architecture.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Company doesn't expect interns to have any knowledge, except basic knowledge of coding & data structures. I have never worked on web applications & didn't know frontend languages. They give us time to learn and gradually increase work. Mentors are very helpful. Team always welcomes to help and KTs are useful. They always tell easier ways to do tasks. But it is essential to complete tasks on time. You can ask for tasks you want to work on and are expected to talk in meetings. It's a better place to start learning right from scratch & they give fewer tasks. Everyone is friendly. Workplace is chill (6 working hours per day) and colorful.

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

Name: MODIT GOYAL(2016AAPS0413H)

Student Write-up

Short summary of work done during PS-II: Worked on building a pipeline to regularly collect the social platforms data and store it in the raw form. Getting the insightful information from this data regularly and finally providing it to the marketing team in the form of various charts and diagrams for a good visualisation and understanding. Learnt on how to stream real time data and how to store it efficiently for further use. Usage of various NLP and ML algorithms to process the data and get the insightful result.

Tool used (Development tools - H/w, S/w): Elements (Walmart internal machine learning platform), HDFS, Spark, Hive, Unix scripting, Scala, Python, SQL, Looker, Oracle DWH.

Objectives of the project: Collecting the data from social platforms and giving some insightful information to the marketing team.

Major learning outcomes: Learnt how the lifecycle of a online retail business works and the roles of the data engineers in that cycle. Learnt what actually the marketing team requires from the engineers that they can use to target the customers better.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Walmart have a pretty good working environment for all the associates like a common area, playing area, canteen, etc. They work on a 10 day sprint pattern for 6 months interns same as the associates. They have good training and KT sessions regularly for technology and expertise development.

Academic courses relevant to the project: Machine learning and DSA.

PS-II Station: Western Digital (SANDISK), Bangalore

Faculty

Name: Preethi N. G

Student

Name: SNEHA SUNDAR(2018H1030037G)

Student Write-up

Short summary of work done during PS-II: The project assigned to me was aimed at creating a tool that would aid in data visualization and analysis. Day to day activities involved the development of the tool, incorporate new features and use cases, obtain feedback from users and make necessary modifications, testing and optimization.

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

Objectives of the project: To develop an application / tool that helps the users in data analysis and automate data visualization.

Major learning outcomes: Practical application of best software architecture practices, algorithms and their time complexities. In depth knowledge of data analysis, visualization tools.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment at the PS station provided plenty of opportunities to grow and develop our skills, apply academic knowledge to real world industrial applications. There was immense support from my manager, mentor and team members, which was helpful especially during the quarantine period. Expectation from the company is that it continues to provide such an environment that made for a valuable internship experience.

Academic courses relevant to the project: Machine learning, Software architecture.

Name: MADHUSMITA OKE(2018H1030194G)

Student Write-up

Short summary of work done during PS-II: My project aimed at designing automation framework and streamlining processing of checkout, Continuous integration and deployment.

Tool used (Development tools - H/w, S/w): Pycharm (Python Programming any IDE), Jenkins, Docker.

Objectives of the project: Automation of checkout and deployment process.

Major learning outcomes: Advanced Python programming, DevOps, System design.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: My experience at WD (SanDisk) has been great in terms of technical skill enhancement and gaining industry exposure. The working environment was collaborative and encouraged innovation. Everyone including senior management were approachable and helpful; always willing to listen to new ideas on project.

Academic courses relevant to the project: Cloud computing, Software architecture, Data science fundamentals.

Name: Radhika Radhakrishnan(2018H1230148G)

Student Write-up

Short summary of work done during PS-II: This project mainly is a study and hence requires extensive NAND memory knowledge. We can say the project is divided into two parts. As phase one we do the literature survey which includes how's and why's of a NAND memory. The second phase commences with using the knowledge acquired as part of phase 1 and applying it to test the NAND samples for its reliability. The reliability check is done in a remotely controlled environment, we need to load the samples in this environment and decide the automation steps to produce a result that replicates the real life scenarios that a NAND memory goes through.

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

Objectives of the project: COMPREHENSIVE ASSESSMENT AND COMPARISON OF THE RELIABILITY OF NAND MEMORY FROM TWO FABs.

Major learning outcomes: Python, C, inhouse tools.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Every company consists of teamwork which refers to a group of people with the complementary and

different skills and abilities who are committed to a common mission and performance goals. WDC believes in this principle and I got a hands on experience of the same. All the tidbits of joining were properly taken care of and the process of me transitioning into the team was completed smoothly. My team had provided me with a very good opportunity to gain hands-on experience by means of my internship project. I hope to be an essential team player in upcoming projects and help in developing my technical skills.

Academic courses relevant to the project: PMMD - Physics and modelling of micro electronic devices.

Name: AYAN SAIKIA(2018H1230252P)

Student Write-up

Short summary of work done during PS-II: I have designed a complete chargepump system during my PS-II in Western Digital (SANDISK), Bangalore. It takes a 2V DC input and generates a regulated output of 8V DC. The charge pump is supported by a clock signal of a period of 40ns. There are essentially three functional blocks in a charge pump system, clock-generator circuit, charge pump and a comparator. The comparator block consists of a two-stage OTA. Since, in a comparator design, high gain is very essential, therefore, the two-stage OTA is designed. Opamp compensation is carried out to make sure the closed loop configuration is stable. It also leads to good settling characteristics. Two most popular approaches are dominant-pole compensation and lead compensation. In the four-phase clock generator circuit, four clock signals are generated, out of which two are overlapping signals and the other two are non-overlapping signals. The overlapping signals are the inverted versions of the non-overlapping ones. Charge pump is a kind of DC–DC converter that consists capacitors and a switch network controlled by some clock signals only. A high potential, either positive or negative, can be generated by the charge sharing actions among different capacitors during two or more clock phases. Conventionally, this kind of circuits was implemented using diode-connected NMOS switch network.

Tool used (Development tools - H/w, S/w): Cadence virtuoso and Finesim.

Objectives of the project:

- The significance of a charge pump system in memory circuits.
- The working of a charge pump system and its functional blocks.
- Understanding the process of designing circuits to achieve stability of a complex system.

Major learning outcomes:

- Understanding various concepts of analog integrated circuit design.
- Designing stable analog circuits like, two-stage OTA, clock-generator circuit, charge pump, etc. across all process corners.
- Learning basic level scripting to access files from various directories.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Western Digital (SANDISK) sets out to achieve its goals in ethical, honest ways with an elevated sense of purpose. I really enjoyed coming to work and always felt appreciated, acknowledged and rewarded. Signs of fear and domination were absent. My team always encouraged creativity, productivity, and thinking outside the box. Employees give 200%. They strive to be the best and to deliver top-quality products and services. They take responsibility for their actions and decisions. Everyone communicates in a cards-on-the-table manner, solving difficulties in a positive way. Everybody view feedback as an opportunity for growth. Employees have a sense of camaraderie, cooperation, and empowerment. Western Digital (SANDISK) adhere to the saying, 'Change is the only constant'. The company and its employees embrace change, accommodate new trends and technology, and incorporate new skills. The company always provide acknowledgement, appreciation, and gratitude towards its employees so that they are motivated. The corporate cafeteria features a healthy menu, and the company gym is stocked with exercise equipment. Western Digital (SANDISK) features natural and recessed lighting with incandescent bulbs rather than halogen or fluorescent. The organization is environmentally aware by encouraging solar power and recycling.

Academic courses relevant to the project: Analog integrated circuit design:

Name: B Swetha(2018H1400124G)

Student Write-up

Short summary of work done during PS-II: Work deals with SSD drive testing before going for mass production. I belong to MST (Manufacturing Self Test) team where we screen out NAND failures from the drive. The report generated is given to production team.

Tool used (Development tools - H/w, S/w): C, Python, HW tools - MST test tools.

Objectives of the project: To screen out NAND failures from the SSD drive.

Major learning outcomes: Self-management, Time management, Problem solving skills, Detail knowledge in C and Python.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Working environment is friendly, good face to face communication for clarification of doubts, very good training process, good opportunity to work hands on from the very beginning.

Academic courses relevant to the project: Embedded system design, RTOS, Device drivers.

Name: Gangapuram Krishna Chaithanya Reddy(2018H1400126G)

Student Write-up

Short summary of work done during PS-II: Worked on the SPI driver development for (STM32H743 Microcontroller) in direct memory access mode, which was required for interfacing micro controller with external ADC to measure currents of the NAND FLASH memory.

Tool used (Development tools - H/w, S/w): Tool: STM32CUBE IDE, C language.

Objectives of the project: To measure the analog current values at higher sampling rate and process the data captured from ADC for further analytics.

Major learning outcomes: Learned about driver development for SPI, DMA.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is friendly, flexible timing, mentors, managers are approachable and guidance provided by them made ease in working. Individual work is recognized.

Academic courses relevant to the project: Embedded system design.

Name: Gangula Dilip Reddy(2018H1400130G)

Student Write-up

Short summary of work done during PS-II: Had worked on various ip's assigned in SOC and created few scripts, that had automated debugging process of these ip's.

Tool used (Development tools - H/w, S/w): Cadence - Xcelium, Simvision, UNIX.

Objectives of the project: To ensure the functionality is as per specification of ips and ensure final RTL is bug free.

Major learning outcomes: 1) Had learnt about various tools like: HSPICE, Cadence - Xcelium, simvision 2) Usage of perl / python scripting 3) Idea of creating UVM as per industrial standard

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: I had very supportive environment from team mates side. They encouraged new ideas for automating the

existing process. Even though, we had WFH from march, I got support my team mates in completing the work assigned to me. During beginning of project, I had few training / KT sessions from team, to understand environment we are using and also architecture specifications.

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

Name: RAVI SINGH CHOUDHARY(2018H1400174P)

Student Write-up

Short summary of work done during PS-II: Project was divided into phases. Phase 1 focused on block level study of data out path, followed by phase 2 which focused on practical implementation of studied information. In phase 2, two tasks were allocated. Firstly, system was designed and analysed the impact of critical parameters at system level. Secondly, high speed flash interface timing correlation between simulation and silicon was done.

Tool used (Development tools - H/w, S/w): Cadence, Hspice, Finesim.

Objectives of the project: There were two objectives. First objective was system design and impact of critical parameters on it. Objective 2 was to perform high speed flash interface correlation between simulation and silicon.

Major learning outcomes: Understanding of high speed data out path and high speed flash interface correlation between simulation and silicon.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Working environment is very nice and team mates makes us very comfortable in the company. They are

always there to help and support in every situation. As an intern, company expects us to understand and explore the various areas.

Academic courses relevant to the project: VLSI design, Advanced VLSI design.

Name: SAMBIT PATRA(2018H1400182P)

Student Write-up

Short summary of work done during PS-II: Worked on developing a firmware to screen out NAND flash issues and test the performance parametrics of the flash drive. Also changed the UI of the tool used for generating workloads for the testing. Went through the SSD controller architecture. Worked on manufacturing test firmware for analyzing the performance and screening the issues of SSD drives. Also worked on fixing the bugs in the firmware.

Tool used (Development tools - H/w, S/w): Internal tools for testing, Work load generation and extracting logs, Lauterbach debugger, Trace32, Gerrit.

Objectives of the project: To develop firmware for testing the flash drives.

Major learning outcomes: Got the experience of working in professional environment. Working on firmware and hardware architecture, helped me to raise my embedded systems skills. Went through the arm processor and rtos implementation in the controller platform. Developed the skill using git version control and use of debugger for tracing the firmware issues & performance stats. Polished my python skills while working on the development of tool interface.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: In the company every one is ready to help you out whenever you ask something. They answer the question in a detailed manner and also guide us in accessing documents or other materials required for that. Manager is always ready to solve any issue we are facing and through weekly

1:1 meeting gets to know our progress, suggests how to improve our skills and provide resources for the same. Team member are always ready to help us in our project if I get stuck somewhere. Hope in future I'll be able to learn more things from my team members and also apply my knowledge in the projects.

Academic courses relevant to the project: Embedded system, Device driver, Software for embedded system, Real time system and VLSI architecture.

PS-II Station: Whirlpool, Pune

Faculty

Name: Samata Satish Mujumdar

Student

Name: ABINASH SARMA(2018H1060212P)

Student Write-up

Short summary of work done during PS-II: Project 1- Innovation of a gear mechanism for refrigerator which would reduce force amplitudes during pulling.

Project 2- Improvement of the ice making time through slot optimisation and improvement of UA values by adjusting the flow rate and proper mixing of air around the surface of ice.

Self development work- Product development cycle, Design thinking course.

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

Objectives of the project: Project 1- To reduce the force amplitudes and reduce the complexity of the mechanism to reduce force fluctuations keeping the output same.

Project 2- To increase the flow efficiency and improve Ice making rate in a refrigerator.

Major learning outcomes: a) CREO b) Design thinking c) Product development d) Required testings for product approval e) Connecting the bridge between theory and practical f) Ice and

water related knowledge in refrigerator g) Flow requirement in the refrigerator compartments h) Working mechanism of different refrigerator builds i) Manufacturing process of refrigerator.

Details of papers / patents: Pending because of current situation, planning to file a patent.

Brief description of working environment, expectations from the company: Work environment based on following parameters,

- 1) Colleagues- Professionals are helpful and they are willing to help the newly joined employees to understand the concepts.
- 2) Technology and Innovation- Company is mainly focused towards innovating new concepts with fully equipped labs and working professionals.
- 3) Learning-Management provides freedom to learn as much as possible and you get recognition and appreciation for what you do.
- 4) Training-Professional training certifications are given to the employees for better career growth.
- 5) Management-Management is one of the best and they are very well oriented towards knowing employees interests.
- 6) Location-The area near the office is very good with different kinds of shops and malls to enjoy the life outside office.
- 7) Work life balance-We get a lot of time to invest on our personal day to day involvements.

Academic courses relevant to the project: Heat transfer, Fluid mechanics, Product design, Quality control and assurance, Thermodynamics, Refrigeration, CFD.

Name: PAVAN KUMAR(2018H1400181P)

Student Write-up

Short summary of work done during PS-II: My role was to assist the team in automating the testing process. My project dealt with automating the HMI encoder control process which is being done partially manual till now. In order to complete this project, I had to write the C#

application which will communicate and control the servo motor attached with Arduino and servo motor in turn will rotate the HMI encoder attached on appliance.

Tool used (Development tools - H/w, S/w): H/w-Arduino, Servo motor, S/W-visual studio, Arduino IDE.

Objectives of the project: Controlling the HMI encoder via C# script.

Major learning outcomes: C# language, Project management.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: It was good to work with whirlpool and hoping for some more challenging work and learning.

Academic courses relevant to the project: Embedded system design.

Name: VIVEK CHATURVEDI(2018H1410151P)

Student Write-up

Short summary of work done during PS-II: A wear simulation methodology was developed, which was validated by replicating the results of three different papers in ANSYS workbench 19.2. simulations of pin-on-disc experiment, pin-on-ring experiment and artificial hip joints were performed and results were compared. Most of the results were satisfactory and were closer to the values in the literature. The correlations were more than 95% in all the three cases. The project work will be useful for Whirlpool in predicting the wear volume of the thimble in the hinges of the refrigerator doors.

Tool used (Development tools - H/w, S/w): ANSYS workbench 19.2, LS Dyna, Hypermesh, PTC Creo.

Objectives of the project: • Developing a standard simulation methodology for wear prediction between two rubbing parts. • Implementing the wear simulation methodology for hinge wear in refrigerator doors, hence avoiding the door sag problem. • Comparing the experimental and simula.

Major learning outcomes: 1) Modelling in SpaceClaim 2) ANSYS workbench 19.2 Tools 3) Tribological concepts of wear 4) Utilizing G suite 5) Presentation skills.

Details of papers / patents: Paper on 'wear prediction using finite element analysis' is under process.

Brief description of working environment, expectations from the company: A good and healthy working environment, very helpful and cooperative co-workers, flexible work timings, approachable management, amazing work-life balance.

Academic courses relevant to the project: Finite element analysis, Tribology.

PS-II Station: WickedRide Adventure Ltd.(Bounce), Bangalore

Faculty

Name: Anjani Srikanth Koka

Brief write-up on each PS-II station: The below mentioned are the expectations from the industry in common apart from some specific skills in a student. A student can be better prepared by practicing these skills.

1. Exposure to marketing and finance course fundamentals 2. Data analytics 3. Proficiency in Excel, Python, R, SQL 4. Soft skills.

Student

Name: JOYDEEP NAG(2016A3PS0233P)

Student Write-up

Short summary of work done during PS-II: Long term Project - Deep learning based OCR for parsing text in drivers licences and verification.

Daily Tasks - Data analysis from databases.

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

Objectives of the project: Build a sleeker and lower cost platform for the users to upload data.

Major learning outcomes: Became proficient in Python, SQL.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Company expects to put in regular work hours. Because this is a fast growing startup, expect to work as hard as a full time employee. However, everyone is very supportive and helpful, especially the team manager.

Academic courses relevant to the project: DBMS, NNFL, Machine learning.

PS-II Station: William O Neil India Pvt Ltd, Bangalore

Faculty

Name: Krishnamurthy Bindumadhavan

Student

Name: PRADHAN PRATYUSH SACHIN(2015B3A30541G)

Student Write-up

Short summary of work done during PS-II: I worked as a equity analyst. Work compromised or screening and selecting stocks for possible additions to recommendation list. Creating reports on why the selected stock is a better option compare to rest of the market. My sectors of focus

were capital equipment, automotive, telecom, internet and media. I also was responsible for a commentaries on sector and market performance on a monthly or weekly basis.

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

Objectives of the project: Create a strong convincing investment case.

Major learning outcomes: Investment accumen, general understanding of economic machinery, working of various sectors and technical reading of charts.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Good working environment with a helpful and interactive colleague group.

Academic courses relevant to the project: A report on financial analysis.

Name: PRADHAN PRATYUSH SACHIN(2015B3A30541G)

Student Write-up

Short summary of work done during PS-II: I worked as a part of the Capital equipment and auto, telecom, media and Internet teams for equity research. My work ranged from making reports for daily newsletter published by the firm to analyzing and creating investment cases stocks.

Tool used (Development tools - H/w, S/w): Bloomberg terminal and Panaray.

Objectives of the project: Equity analysis.

Major learning outcomes: Technical and fundamental analysis.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Good working environment with small independent teams majorly comprising of IIM graduates.

Academic courses relevant to the project: Business analysis and valuation, Macroeconomics, Financial management.

PS-II Station: Wonder Cement, Udaipur

Faculty

Name: Gaurav Nagpal

Student

Name: SANTOSH KUMAR SHUKLA(2018H1490357P)

Student Write-up

Short summary of work done during PS-II: The aim of the project is to bring on-board potential dealers for Wonder Cement Ltd. in the regions of Ghaziabad. This project will lead to network expansion and in will increase the presence as well as sales of Wonder cement in this area.

Tool used (Development tools - H/w, S/w): Microsoft excel, Word, Power point.

Objectives of the project: To open potential dealer and retailer counters in the region of Ghaziabad.

Major learning outcomes: Social selling, Sales process, Relationship management, Product knowledge and Goal orientation.

Details of papers / patents: No.

Brief description of working environment, expectations from the company: Working environment in wonder cement was great. In expectation point of view they have high expectation from intern, its shows during lockdown.

Academic courses relevant to the project: Yes, academic course were very relevant like marketing management and sales management helped a lot during PS.

PS-II Station: Xilinx India Technology Services Pvt. Ltd., Hyderabad

Faculty

Name: Belde Vinay

Student

Name: Nayak Jayesh Jagannath(2018H1230158G)

Student Write-up

Short summary of work done during PS-II: The work I was allotted was working on Python scripts and some Pearl scripts. So, the company has developed a way to match the software delays with the hardware delays of FPGA (Field Programmable Gate Array), since the delay changes when device is fabricated and it is not possible to measure all the delays after fabrication. The Python scripts where based on some machine learning algorithm, so I had to learn these algorithms which was the very 1st task assigned to me. Then one of the senior team mate explained the working of the Python script in brief. So, then on I had to run the Python scripts with different technology corner files and report the output (error between the S/W and H/D delays). There were many technology files and also I had to make the required changes to the script while running it. After 2-3 months I got assigned some Pearl scripts as well. The Pearl scripts were used to extract data and produce the required input files for the Python scripts. The Python scripts also included many other libraries like Pandas, Numpy and many other functions as well.

Tool used (Development tools - H/w, S/w): Python, PEARL scripting, Linux terminal, Command prompt, Anaconda SPYDER, Excel.

Objectives of the project: To help the team in simulating Python and Pearl scripts.

Major learning outcomes: Teamwork is important, learned a new scripting language (Pearl language), machine learning algorithm, communication was important during work from home, working with directories (paths), Linux terminal commands, working in excel.

Details of papers / patents: Papers relating to FPGA interconnects and its architectures.

Brief description of working environment, expectations from the company: Work environment is pretty good, each one has a cubicle, all the team members were very friendly and welcoming. Every one prefers to be called by their name and not sir or madam which even includes higher authorities. The managers are all well experienced and helpful regarding all aspects. The expectations from me was to complete the assigned work within the time frame and also understand the scripts well so that I could solve errors on my own and help other team mates to know the working of scripts.

Academic courses relevant to the project: CAD for IC (Python), Reconfigurable computing.

Name: Nayak Jayesh Jagannath(2018H1230158G)

Student Write-up

Short summary of work done during PS-II: My work involved working with Python, Perl scripts. The Python scripts needed to be simulated with different technology corners. These Python scripts were based on machine learning algorithms so i had to study these algorithm which was also the 1st task given to me. There are many libraries which I learned like Pandas, SciPy, Sk-learn (some functions from these library). Also learned Perl (Practical Extraction and Reporting Language). Work was on Linux system, so the basic commands pertaining to terminal had to be learned and also working on directories. The work consisted of generating .csv files

(comma separated value) using Perl script, giving these files as input of a Python and generating the error plots and also making the required changes to Python scripts for generating the data needed.

Tool used (Development tools - H/w, S/w): Python, Perl languages, Anaconda-SPYDER, Linux terminal, command prompt, strawberry Perl, Excel.

Objectives of the project: Finding the error between H/W and S/w delays.

Major learning outcomes: Perl (Practical Extraction and Reporting Language), working with Linux system, basic and some advance commands pertaining to Linux terminal, machine learning algorithms, Python library a such as Pandas, SciPY, Sk-learn, working with directories.

Details of papers / patents: Papers on FPGA (Field Programmable Gate Array) interconnect and FPGA architecture.

Brief description of working environment, expectations from the company: The working environment is good all the team members have a welcoming attitude, even the managers are really nice. Everyone prefers to be called by their name and not sir or madam, including the managers. Each one has a separate cubicle. Expectations were to do the assigned job in given time, mostly deadlines were weekly, also to be self reliant in case of debugging, making certain changes to the scripts to get the data, knowing how all scripts work in depth, working with a team member.

Academic courses relevant to the project: CAD for IC (Python part), Reconfigurable computing.

PS-II Station: Zendrive India Pvt Ltd, Bangalore

Faculty

Name: H. Viswanathan

Student

Name: ASHUTOSH GOEL(2015B3A70658P)

Student Write-up

Short summary of work done during PS-II: My major work was on pyspark which is a cluster framework for processing large amount of data in distributed environment and geopandas (Google it for more details). I worked on implementing a scalable approach to perform spatial calculations in distributed environments. (Spatial calculation meaning making sense out of geo-location of a point, like finding state, zipcode for any location across globe etc). The work was very good and I got to learn a lot from it. I got to test my hands on python, pyspark, geopandas, shapely, rtree, aws and many more during project. Best thing about the work at zendrive is you get thorough knowledge of the tech you are using and get a complete picture of the how your project will help the company.

Tool used (Development tools - H/w, S/w): Pyspark, Geopandas, Shapely, Rtree, AWS, Postgres, OSMDb, Cprofile.

Objectives of the project: To make the code scalable by removing the bottleneck.

Major Learning Outcomes: This project helped me learn a lot of things starting from spatial data computation in POSTGIS to how to compute the same using shapely. I learned how Rtree indexing works and its role in performance improvement. Debugging the results from our new approach helped me gain more knowledge of our code base and improve my debugging skills. In order to optimise the my code, I learned time profiling for code. I learned to write unit tests in Python.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: AWESOME in one word. People here are very nice and brilliant. Interns project is given proper importance and all sorts of help is provided to help you learn better. Teams are small and you have regular interaction with the team which makes you comfortable with everyone very quickly. Working time is flexible as in most IT companies. You can expect to learn a lot at zendrive.

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

Name: JAJU VEDANT VINOD(2016A3PS0303H)

Student Write-up

Short summary of work done during PS-II: 1. The first project was to complete a client billing script in python where the required data was available on the elasticsearch cluster.

2. The second project was to write a spark job to fetch 2 tables from the production database, perform some operations, archive it in S3 and, index it in elastic search.

3. The last project was enabling Role-based access control (RBAC) on the elastic search cluster. We implemented and tested the solution using the Readonlyrest plugin. Later, I started developing a custom plugin in Java that was tailored to our use case. We then explored the X-pack security APIs to implement the solution. We finally implemented RBAC using X-pack APIs after a comparative study.

Tool used (Development tools - H/w, S/w): Spark, Elasticsearch and Kibana, Python, Java.

Objectives of the project: Implementing role based access control (RBAC).

Major Learning Outcomes: 1. Parallel computation using spark 2. Deep understanding of Elasticsearch.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The work culture is amazing. Everyone is approachable, co-operative and understanding. The Company put great efforts to ensure good learning opportunities provided to interns.

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

Name: Aabhaas Vaish(2016A3PS0370P)

Student Write-up

Short summary of work done during PS-II: I was majorly involved in the design and development of a stacked machine learning model that was trained on the driving trips of individual users with the end goal of creating personalized models that can ‘fingerprint’ or identify driving patterns for individual users.

Tool used (Development tools - H/w, S/w): Python, Pandas, Scikit-Learn, NumPy, PySpark, Jupyter, Seaborn, Matplotlib.

Objectives of the project: Driver v/s Passenger classification.

Major learning outcomes: I got the opportunity to work with real-world data in my project which helped me in learning about the importance of data cleaning and feature engineering. I also got to work with state-of-the-art machine learning models as well as PySpark.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The project was an exploratory data science project which gave me freedom to experiment and try out different methods and techniques. The environment was highly collaborative and supportive as well.

Academic courses relevant to the project: Neural networks and Fuzzy logic.

Name: BUTTE KAUSTUBH PRADEEP(2016A8PS0364G)

Student Write-up

Short summary of work done during PS-II: My work involved different things some of them being: Fetching SDK logs from Elasticsearch server, Building an API which returns SDK logs based on input parameters, Adding new metrics for calculating aggregates which help in visualizing SDK's performance. Building a website to view and transform SDK logs.

Tool used (Development tools - H/w, S/w): Python, PySpark, Elasticsearch, Kibana, HTML, Javascript, Vuejs.

Objectives of the project: Build an API and a website which will help in browsing SDK logs which is required by engineers in many teams.

Major learning outcomes: Learnt about PySpark, learnt how to organise large codebases of APIs. Learnt how websites dealing with large amount of data are built. Learnt about mocking which is needed when writing unit tests of functions which depend on third party dependencies.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: The working environment is quite friendly. You won't feel like an intern here. You will feel like an important part of the team. People at Zendrive are welcoming.

Academic courses relevant to the project: DBMS, DSA.

Name: MAYANK SHARMA(2016A8PS0388G)

Student Write-up

Short summary of work done during PS-II I worked with both the iOS and the Android SDK team. My work started with adding sanity checks for configuration files and I had to understand the release scripts for iOS and Android and come up with a new design to address the existing problems. The design was implemented on Jenkins and the master release script was changed from bash script to python to make debugging easier. The main emphasis was on making the design as seamless as possible for the developers to make the releases quick and efficient.

Tool used (Development tools - H/w, S/w): Bash script, Python, Jenkins, Xcode, Android studio.

Objectives of the project: Design and Implementation of SDK (Software Development Kit) and Internal App release pipeline.

Major learning outcomes: The major learning outcomes were to understand the current release process followed for SDK (Software Development Kit) come up with a new design to address the cons of the existing release. I understood how continuous integration and continuous delivery pipelines work and deployed it on Jenkins.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Zendrive is an excellent place to work at. Everyone is quite approachable and I managed to stay in constant touch with them even during work from home. The timings are flexible but the company comprises of hard working and talented people.

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

Name: MAYANK SHARMA(2016A8PS0388G)

Student Write-up

Short summary of work done during PS-II: My project was based on understanding the release of the SDK (software development kit) and internal app. I worked with both the Android and iOS team to come up with a new design. Migration of master release script was done from bash to python to make debugging easier. In order to familiarise myself with Jenkins, my initial task was to add sanity checks for configuration files. The final design was deployed on Jenkins.

Tool used (Development tools - H/w, S/w): Jenkins, Groovy, Xcode, Android studio, Bash script.

Objectives of the project: The objective of the project was to find the problems with the existing release and come up with a new design to make the release process as intuitive and seamless as possible for developers. This design was implemented on Jenkins with the automation.

Major learning outcomes: The major learning outcomes were to understand how the code release works, come up with a design to address the existing problems such as lack of internal release and manual approval, understand how CI/CD pipelines work and deploy it on Jenkins.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: Zendrive is an excellent place to work at. Everyone is approachable and the I was able to stay in constant touch with my mentor even while working from home. The timings are flexible but the company comprises of hard working and talented people.

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

PS-II Station: Zeotap India Pvt. Ltd., Bangalore

Faculty

Name: Raja Vadhana P

Student

Name: ISHAN GARG(2016A7PS0066G)

Student Write-up

Short summary of work done during PS-II: The data at Zeotap is growing at a significant scale which might lead to ignoring the quality of the underlying data asset. Hence, there is a need to use data science (DS) and a lot of proxies to ensure the sanctity of the data. This is at the core of any data-led platform from a revenue standpoint. I was working with DS engineering team whose job was to ensure end to end deployment of DS models. I worked on implementation of new id resolution method and built a pipeline for performance comparison. Apart from this, there were some other small tasks allocated like optimising pipelines and implementing workflow schedulers.

Tool used (Development tools - H/w, S/w): Scala, Apache spark, Gremlin, JanusGraph, ScyllaDB, Airflow.

Objectives of the project: To ensure that the quality / consistency of the identity graph is maintained as the company scales the number of data partners.

Major learning outcomes: I got to explore the field of big data (using Spark), learned a hybrid programming language (FP+OOP) Scala, graph querying language (Gremlin), indexing in databases and workflow scheduling.

Details of papers / patents: NA.

Brief description of working environment, expectations from the company: While working at Zeotap, I got to experience the startup culture. I was given the sole ownership for implementation of the project while collaborating with DS and product team. One gets to work

on latest tech stack and can broaden his / her skill set. Company has flexible working hours but the quality of tasks given depends a lot on one's team.

Academic courses relevant to the project: Object oriented programming (OOP), Data structures and algorithms (DSA), Database management system (DBMS).

Name: DEEP CHOWDHURY(2016A7PS0068G)

Student Write-up

Short summary of work done during PS-II: Primary task was the construction of a periodic pipeline that runs routinely to identify stale IDs and generate reports on effects of deletion for various ID types and their corresponding data. The project's goal is to delete unused IDs for better data quality and reduce storage costs. Additional tasks include, Migration from Oozie to airflow where I had to recreate an existing Oozie workflow which used xml using airflow in Python.

Fixing aerospace deletion in DryRun mode which was a bug in the code which caused aerospace deletion when run in dry run mode to give incorrect outputs.

Added support to output ID profile reports which was an additional feature to the primary pipeline.

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

Objectives of the project : Identifying the IDs with low chances of survival to calculate reports on how it would effect the volume of IDs and the data related to these IDs if deleted.

Major learning outcomes: Software development, End to end pipeline of code deployment, Big data, Data engineering.

Details of papers / patents: None.

Brief description of working environment, expectations from the company: Th company provided a very work-friendly environment. Task allocation was swift and we could get started with the project right away. Projects used a very large and diverse tech stack which honed my

technical knowledge. The colleagues were super friendly and were always there to help me out with any questions I had.

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

PS-II Station: Zinnov Management Consulting Pvt. Ltd., Gurgaon

Faculty

Name: Anjani Srikanth Koka

Brief write-up on each PS-II station: The below mentioned are the expectations from the industry in common apart from some specific skills in a student. A student can be better prepared by practicing these skills.

1. Exposure to marketing and finance course fundamentals
 2. Data analytics
 3. Proficiency in Excel, python, R, SQL
 4. Soft skills
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