

Birla Institute of Technology & Science (BITS), Pilani
Practice School Division
Practice School – I Chronicles (Electronics Domain)
PS-I Summer 2023 (May 30 – July 22, 2023)

Date of Release: March 26, 2023



BITS Pilani
Pilani | Dubai | Goa | Hyderabad | Mumbai



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PS-I station: Alltronix International Inc - IIOT , Hyderabad

Student

Name: ABHIMANYU MAGAPU(2021A3PS2516G)

Student Write-up:

PS-I Project Title: Factory automation

Short Summary of work done: We designed, built and simulated smart and automated version of systems built for use in the household and industrial area. The designs were simulated on Tinkercad and built using arduinos.

Objectives of the project: Make a circuit to with factory automation features on tinker ad

Tool used: Tinkercad software

Details of Papers/patents:-

Brief description of the working environment: Lectures were informative, we learnt about industrial and military products and their uses in their respective domains. We also got to know about the history about the various industrial revolutions and the upcoming revolution of industry 4.0.

Academic courses relevant to the project: Digital design, MUP

Learning Outcome: Arduinos

PS-I station: Alltronix International Inc - IIOT , Hyderabad

Student

Name: RAJASEE KAR .(2021A8PS2907H)

Student Write-up:

PS-I Project Title: Smart Home Automation

Short Summary of work done: I, with my teammates, made a Smart Home Automation System that had the following functional elements: • a centralized home lighting system • a gas leak detection system • a fire detection and suppression system • a door keypad lock • an automated hand sanitizer dispenser • an integrated rainwater harvesting, rainfall detection, and irrigation system. • a remote center for emergency response

Objectives of the project: To build a model for an automated Home Automation System.

Tool used: Tinkercad, Arduino

Details of Papers/patents:NA

Brief description of the working environment: My mentor Mr. Aryan was very approachable and helpful. My teammates were very cooperative as well. The initial orientation seminars covered the theoretical aspects of various topics such as IoT, communication protocols etc. However, I felt that the final project was very unrelated to the initial sessions, moreover since the sessions took up so much time the start of the actual project was delayed and hence the work was rushed. Overall, it was a learning experience, the PS diary notes allowed me to keep up and remember the things taught in the sessions. The project itself was very informative and an excellent learning opportunity.

Academic courses relevant to the project: Electrical Sciences, Digital Design, Microelectronic Circuits

Learning Outcome: I conducted a literature review and built the project, which allowed me to innovatively use the elements on Tinkercad for unique purposes. The major learning outcomes are as follows:

- Knowledge about working principles of various sensors.
- Use of TinkerCAD as a circuit simulation software.
- How to communicate using the serial protocol.
- Simulation of several sub-systems for Home Automation and understanding them.
- Understanding of Arduino UNO.

PS-I station: Alltronix International Inc - IIOT , Hyderabad

Student

Name: APOORVA JAIN(2021AAPS2858G)

Student Write-up:

PS-I Project Title: Smart Factory Automation

Short Summary of work done: Learned about IoT devices and sensors, Arduino Uno and various TinkerCAD simulations

Objectives of the project: TinkerCAD simulation of Smart Factory Automation

Tool used: Arduino Uno, TinkerCAD, C++

Details of Papers/patents:NA

Brief description of the working environment: Online station so working environment is not valid, company expected work to be done on time, although very little time was given, learning outcome is mentioned above

Academic courses relevant to the project: NA

Learning Outcome: TinkerCad, C++ coding, Arduino Uno, various sensors and devices, presentation skills

PS-I station: Alltronix International Inc - IIOT , Hyderabad

Student

Name: NIKHIL MAHESH TAMBOLI(2021B2AA1603G)

Student Write-up:

PS-I Project Title: Smart Home Automation

Short Summary of work done: Made a simulation project in tinkerCAD

Objectives of the project: Creating a smart home automation in tinkerCAD

Tool used: tinkerCAD

Details of Papers/patents:NA

Brief description of the working environment: It's a small company with less number of employees. The environment is friendly and they encourage active learning.

Academic courses relevant to the project: NA

Learning Outcome: tinkerCAD and various sensors

PS-I station: Alltronix International Inc - IIOT , Hyderabad

Student

Name: MUDIT RAJEEV JAIN.(2021B3A71000P)

Student Write-up:

PS-I Project Title: Hospital Automation

Short Summary of work done: Created small scale simulation projects using tinkerCad

Objectives of the project: To analyse and discover innovative application of automation in Hospitals and other Healthcare Industry

Tool used: TinkerCad

Details of Papers/patents:NA

Brief description of the working environment: The 1st month was more of an orientation of the company month. I think this was highly exaggerated. The orientation sessions had no relevance with the projects we were asked to complete.

Academic courses relevant to the project: NA

Learning Outcome: Learnt TinkerCad Software

PS-I station: Alltronix International Inc - IIOT , Hyderabad

Student

Name: KHUSHI GOURYSHETTY .(2021B3A73042H)

Student Write-up:

PS-I Project Title: Hospital Automation

Short Summary of work done: We went through the products that our station deals with in providing solutions to its clients and were asked to make simulations on TinkerCAD to learn the working of arduino and other components used in the automation world. We made multiple systems on TinkerCAD to automate various daily activities.

Objectives of the project: Simulate systems to automate the hospital environment .

Tool used: Arduino Programming

Details of Papers/patents:none

Brief description of the working environment: My Station worked completely online and the employees hoped we have interactive sessions and actually implement whatever learnt in the final project.

Academic courses relevant to the project: Electrical Science

Learning Outcome: learnt how to use TinkerCAD

PS-I station: Alltronix International Inc - Management , Hyderabad

Student

Name: AYUSH KUMAR SINHA(2021A4PS2892G)

Student Write-up:

PS-I Project Title: Sales cycle and procurement through government tendering process

Short Summary of work done: During PS1, there were multiple orientation sessions organized by the PS1 mentor where I got an overview of multiple sub-topics under Management. Apart from that, I was also able to understand the formats of Tender bids (both the technical bid and the price bid), the formats of Purchase order and also of the Tax Invoice. Also, apart from only understanding, I was able to make my own bids, both technical bid and price bids, and also made a purchase order as well as tax invoice.

Objectives of the project: The objectives of this project throughout my Practice School-1 duration at Alltronix International Inc. are as follows: a. Understanding and trying to make a technical bid of the two-part bid. b. Mentioning the commercial terms as per the Tender bid (glossary). c. Purchase order for tendered item to buy the item from the manufacturer. d. Payment/Invoice for the product supplied to the end customer.

Tool used: Microsoft Office Word, Microsoft Excel, Microsoft Powerpoint,

Details of Papers/patents:NA

Brief description of the working environment: The work environment was very healthy and punctuality was valued. The company expected people with good communication skills and a healthy technical knowledge in general. The company also expects students to be able to handle unexpected situations with calmness and composure.

Academic courses relevant to the project: Technical Report Writing, Electrical Science, Electrical Machines,

Learning Outcome: Learn how to make a bid, a purchase order and also the tax invoice.

PS-I station: CDOT , New delhi

Student

Name: SOHAM GUHA MAZUMDER(2021AAPS2855G)

Student Write-up:

PS-I Project Title: Android Based Attendance System

Short Summary of work done: Our work involved developing an app for attendance marking using face recognition algorithms and CameraX. The app was divided into two parts and I was responsible for the 2nd half which was designing the Admin Page consisting of three buttons- Add Employee, Train Model, Display Database. The first one opens up the camera feed and allows the staff to add a new face to the system. It captures the contours and stores the embedding in the database. After adding the face, training the model is essential for the algorithm to update. Lastly, one can view the database listing all the employees. Additionally, I worked on the dynamic and modern background of the app with neat animations and smooth buttons.

Objectives of the project: Developing an android app to mark attendance of employees using modern Face Recognition algorithms. The app also has features like adding more employees and viewing the employee database

Tool used: Android studio, java, MLKIT AND CAMERAX libraries of AS. Tensorflow models

Details of Papers/patents:n/a

Brief description of the working environment: The working environment was very employee-friendly, with the staff always eager to assist if need be. The mess hall was large and the food quality was very high. I was able to sit in peace and focus on my task and was also able to learn by watching videos and reading articles and guides. My mentor was instrumental to my progress and I am grateful to have gotten such a good teacher. I learned about many new domains in the technical field like android development and added on to my knowledge on Machine Learning and neural networks.

Academic courses relevant to the project: Machine Learning, Computer Programming

Learning Outcome: Learned about android developemnt and using Java and Android Studio to make apps
Learned about Neural Networks and Tensorflow algorithms

PS-I station: DANLAW TECHNOLOGIES INDIA LTD , Goa

Student

Name: ANUBHAV MON BARUAH .(2021A8PS3198H)

Student Write-up:

PS-I Project Title: Debugging of Test Failures (of PCBAs)

Short Summary of work done: During Our tenure as interns at Danlaw Technologies India Ltd., I and my fellow interns made a web-application/tool which could be used by the debugging engineers in the company to analyze and solve the errors that occur in the PCBAs , specifically DL-548 and DL-545. For this purpose, our first step was to create a website using HTML,CSS and JavaScript that would house a dropdown menu with the option of selecting the test-cases that might have been the probable cause of failure. Selecting any of the test cases from the dropdown would take them to an external website-'MindMeister' where we made a flowchart with all the steps that would help them in solving the particular cases. Apart from this, we also attached the images of the specific parts of the PCBs where the fault occurs. This would help them in efficiently identifying and solving the error without manually searching for the steps and the parts. We then carried out a similar process for the External errors that the client reports back to the company if the product shows any defect within the warranty period.

Objectives of the project: To Make a Website and Flowcharts to help in Debugging of Test Failures for PCBAs

Tool used: HTML,CSS ,JavaScript and Mindmeister(Website)

Details of Papers/patents:None

Brief description of the working environment: Danlaw Technologies India Ltd. had a very professional working environment. We were asked to maintain formal etiquette at all times. The mentors at the company were very forthcoming whenever we had any doubts regarding the work expected of us and did their best to guide us even when they were busy with their own work. They explained the workings of the company to the best of their capabilities and expected us to give our hundred percent as well. Overall, it was a very good experience working in the company.

Academic courses relevant to the project: Computer Programming

Learning Outcome: 1. I learned to use Html, CSS and JavaScript to create websites and apply my knowledge to the industry.
2. I also learned to analyze the data provided by the company, use it as per my requirements, and lay it out in a format that everyone could understand.
3. My most valuable learning outcome was understanding the value of teamwork in an office environment.

PS-I station: DANLAW TECHNOLOGIES INDIA LTD , Goa

Student

Name: ADITYA TANISHQ NAIDU MAMIDI .(2021B4AA1879H)

Student Write-up:

PS-I Project Title: Debugging of test failures

Short Summary of work done: During my PS-I at Danlaw Technologies, I worked on two significant projects focused on improving the debugging processes for electronic circuit boards. The first project involved developing a web application and flowchart tool for End-of-Line (EoL) Testing of PCBs (DL-548) during manufacturing. The tool provided step-by-step debugging procedures and highlighted faulty components, streamlining the debugging process and saving time for operators. The web application allowed easy access to these resources for future use. The second project focused on the RMA testing process, where returned circuit boards within the warranty period needed troubleshooting and repairs. I analyzed data from Excel sheets to identify common issues and created flowcharts and debugging procedures for five frequently occurring cases. This systematic approach reduced repair time, minimized errors, and enhanced diagnostic accuracy for engineers. Throughout the projects, I faced challenges such as limited data availability and time constraints, but successfully overcame them. After implementing the flowcharts and procedures in the factory, engineers reported increased efficiency and improved overall productivity. Overall, my work has made significant contributions to Danlaw Technologies, streamlining the debugging processes for DL-545 and DL-548, and positioning the company for future success in resolving issues related to these products efficiently and accurately. The creation of a user-friendly website and comprehensive flowcharts has proven valuable for both technical and non-technical stakeholders, reaffirming my commitment to delivering exceptional results.

Objectives of the project: To understand and formulate a debugging procedure of the internal failures and field failures of PCBA

Tool used: Html, css, js, mindmeister

Details of Papers/patents:none

Brief description of the working environment: During my PS-I at Danlaw Technologies, the working environment was dynamic and collaborative, fostering a culture of innovation and teamwork. The company's global leadership in connected cars and automotive electronics provided an exciting and challenging atmosphere for learning and growth. The two locations, Hyderabad and Goa, allowed exposure to different aspects of the company's operations, with Hyderabad focusing on customized design solutions and Goa specializing in PCB manufacturing.

Expectations from the company were high, as they sought innovative and efficient solutions for dynamic environments. As a summer intern, I was expected to actively participate in projects and contribute fresh perspectives to address real-world challenges. My responsibilities included designing flowcharts, aligning their contents, and creating a web application for debugging processes. I needed to meet project deadlines while maintaining high standards of quality and accuracy.

During PS-I, I gained invaluable learning experiences. Working on the EoL Testing project, I learned about PCB manufacturing processes and the critical role of debugging in ensuring product quality. The RMA testing project taught me how to analyze data effectively and identify common issues for creating systematic procedures. Additionally, I enhanced my skills in web development, using HTML, CSS, JavaScript, Bootstrap, and jQuery to create a user-friendly website.

Overall, PS-I at Danlaw Technologies provided me with hands-on industry experience, improved my technical skills, and taught me the importance of collaboration and structured problem-solving. The exposure to real-world projects and high expectations from the company enabled personal and professional growth, making it a highly rewarding learning experience.

Academic courses relevant to the project: Electronics, Web development

Learning Outcome: Debugging procedure of test failures

PS-I station: DYSL-CT DRDO , Chennai

Student

Name: PRADYUT GANESH .(2021AAPS2434H)

Student Write-up:

PS-I Project Title: Developing a Fast fourier Transform IP in verilog

Short Summary of work done: The project was about building an IP in verilog that performs Fast Fourier Transform operation on the inputs. The major challenge was tackling bit overgrowth that happens after every multiplication and addition. Several methods to tackle them like scaling and block floating point was studied and implemented. The project also involved working with fpgas. Some basic codes were implemented in the fpga like counters.

Objectives of the project: - develop a verilog code that takes inputs and performs an FFT on them

Tool used: Vivado , Vitis

Details of Papers/patents:None

Brief description of the working environment: The working environment was good . All the scientists were very supportive and helped me a lot during the duration of the project.

Academic courses relevant to the project: Digital Design, signals and system

Learning Outcome: - verilog coding
- concept of bit overgrowth and ways of handling them
- concepts about edge computing

PS-I station: DYSL-CT DRDO , Chennai

Student

Name: DEEPA N .(2021B4A73132H)

Student Write-up:

PS-I Project Title: Implementation of Machine Learning algorithms and understanding their inferences using Explainable AI

Short Summary of work done: I was able to successfully complete 2 projects during my internship at DRDO. The objective of the first project was to explain the predictions of Machine Learning algorithms using Explainable AI (XAI). In this project, I implemented 5 algorithms namely, Decision Tree, Random Forest, Support Vector Machine, K - Nearest Neighbors, Naive Bayes and explained the results using LIME and SHAP XAI algorithms. These algorithms were specifically chosen to ensure I gain a feel for both low-level or reflex learning models and higher-level or state-based learning models while also comparing their performance and efficiency. The aim of the second project was to implement Optical Character Recognition (OCR) using a Deep Neural Network by implementing feedforward and convolutional neural networks. I trained the model parameters to ensure it could recognize any numeric character from an image with a Top-1 accuracy of 98%.

Objectives of the project: The objective of my first project was to implement Machine Learning algorithms and explain their predictions using Explainable AI (XAI). The aim of the second project was to implement Optical Character Recognition (OCR) using Deep Neural Networks.

Tool used: Python, Scikit, Keras, Tensorflow

Details of Papers/patents: Nil

Brief description of the working environment: The work environment was amazing as I was well-supported and encouraged to collaborate with other scientists. My mentor, Mr. Manish Pratap Singh (Director, DYSL-CT DRDO) encouraged me to delve into Explainable AI (XAI) which is a budding field with a lot of future scope. He also personally took out time to provide conceptual clarity and highlight recent advances in the field. I was also given ample time to learn and grasp these new concepts and techniques. The organization expected us to be punctual and abide by their workplace protocols. I am grateful to have learnt a lot of new concepts which I wasn't familiar with earlier.

Academic courses relevant to the project: Computer Programming, Probability and Statistics

Learning Outcome: My primary takeaway from this internship was my new-found ability to better understand and optimize Machine Learning algorithms. Explainable AI (XAI) algorithms helped provide insight into the inner workings of AI algorithms I used to treat as black boxes. I also got a chance to develop my interpersonal skills by interacting with scientists from diverse fields and got a feel for how rewarding work can be in an inclusive and supportive environment.

PS-I station: Eclipse Prism Medical Device Pvt. Ltd. - Onsite , Thane

Student

Name: ROHAN SANDEEP DONGRE(2021A8PS2570G)

Student Write-up:

PS-I Project Title: Simulation of circuits for RF Generator

Short Summary of work done: Simulation of circuits such as VCON amplifier, AC to DC convertor and more circuits of RF generator were simulated on TINA software, and transient analysis was done. Along with this understanding the debugging process of microcontrollers was done on STM32CubeIDE. After these simulations, MTBF and reliability of the medical devices manufactured was calculated.

Objectives of the project: Understanding how simulation is useful for debugging the circuits instead of directly going for physical checking of hardware

Tool used: S/W: TINA (s/w provided by texas instruments), STM32CubeIDE, MTBF calculator

Details of Papers/patents:-

Brief description of the working environment: My project was revolved around the embedded side side of electronics and the design and development department of the company. It was an amazing experience to work under the company supervisors. The department head was approachable and used to help me throughout be it any difficulty or providing me with a new software to learn which would help me along the way ahead. Same with all the superiors, they were very welcoming and used to guide me through my project course. Even though it wasn't in my project, the manufacturing and assembling team taught me how the assembly process is done step by step.

Academic courses relevant to the project: Microelectronic circuits, Microprocessors and interfacing.

Learning Outcome: Simulation of circuits gives us numerous graphs, of which transient analysis was checked by me. Simulation has its advantages being:

- 1)Design verification
- 2)Cost and time saving
- 3)Easier analysis of complex circuits
- 4)Exploration of design space

PS-I station: Eclipse Prism Medical Device Pvt. Ltd. - Onsite , Thane

Student

Name: PARTH GANDHALE .(2021B4A32365H)

Student Write-up:

PS-I Project Title: Operation Theatre Integration using QT 6 Framework

Short Summary of work done: Integration in Operation Theatre (OT) usually refers to systems integration, which means functionally connecting the OT environment. Regarding Eclipse Prism Medical Devices (EPMD), they have a specific piece of hardware known as a matrix video switcher. A matrix video switcher is a hardware device used to switch or choose between different audio or video sources. The main functionality is for selecting between the sources of audio or video. The AVS HDMI2-4x4-R2 is a professional 4x4 HDMI 2.0 Matrix Switcher. EPMD wanted us to design the GUI display which is to be used for controlling this matrix video switcher using the QT 6 Framework. The framework was designed using the QT creator 10.0.2, which has a very well-designed UI interface designer, along with having accessible and understandable documentation available online. This resulted in a smooth process regarding the building of the GUI. Another small project undertaken was of process mapping, which was assigned so that students could get familiar with the different processes of the company, how they are undertaken and executed, and basically acquire knowledge regarding the organisational structure of the corporation. This was done by creating swimlane/deployment diagrams using LucidChart and SmartDraw to help streamline this process, before it's final execution in Microsoft PPT.

Objectives of the project: Design a GUI for a matrix video switcher using the QT 6 Framework

Tool used: QT 6

Details of Papers/patents:None

Brief description of the working environment: Very friendly and amicable working environment. The employees I interacted with were helpful, experienced and knowledgeable.

Academic courses relevant to the project: CS F111, EEE F111

Learning Outcome: - learnt how to use QT
- development of soft skills
- organisational acumen was acquired

PS-I station: Eclipse Prism Medical Device Pvt. Ltd.- Online , Mumbai

Student

Name: GOVIND MALPANI .(2021B5A32280H)

Student Write-up:

PS-I Project Title: Thermal Management of LED lighting in Operation Theatre

Short Summary of work done: The internship started with understanding how thermal management is crucial, especially in an OT. Initially, I worked on understanding different properties of light, the type of LED used and previously used thermal management techniques by the company. Luminance(Lm), chromaticity, correlated color temperature(CCT), junction temperature(Tj), and forward and reverse current(If and Ir) are some of the properties associated with LED lights. surgical lights are mainly warm white, neutral, and cool white color. Later I was asked to find other methods of heat transfer. synthetic jets, axial fans, and heat pipes are some of the devices which work on the principle of air and liquid cooling. I got to analyze the company's datasheet explaining the properties of LED. The datasheet help me analyze the relation between junction temperature, luminance, and forward current with the amount of heat transferred. I did calculate heat transfer by conduction, convection, and radiation. Obtaining the numeric value of the total amount of heat transfer from the LED helped to calculate the temperature inside the LED.

Objectives of the project: To find a efficient Heat sink technology for LED to increase its lifetime

Tool used: Nothing except MS word, Excel (for graphing)

Details of Papers/patents: Oscon and CREE datasheet (explaining properties of LED lights)

Brief description of the working environment: The Internship was online, There was a weekly assessment. I have to submit a weekly report about the progress. The communication was mainly through WhatsApp. The resources which are required were shared through google drive. It is important to know that no one will be teaching us anything. I had to learn on my own. The work was a kind of self-study. I think interaction with an industrial expert via google meet/Microsoft Teams was missing. The introduction meeting was quite good. I was having an individual project so the work allocated to me was not specific. Being a dual degree student, I got good exposure to the electronics industry. Previously I have already worked on a thermal management-related project, so it was easy for the company to allot me work similar to it.

Academic courses relevant to the project: Heat transfer through conduction, convection, and radiation, optics, electrical science, thermodynamics.

Learning Outcome: Understanding heat transfer mechanism, applying knowledge of optics, thermodynamics, power electronics

PS-I station: EFY , New delhi

Student

Name: SATVIK GUPTA(2021A8PS3032G)

Student Write-up:

PS-I Project Title: Short Circuit Protection in EVs

Short Summary of work done: I was allotted a project by my mentor. The project was provided to the company by a third party, called "author". He provides a write-up of project. I was tasked to verify the project by physically implementing it. After verification, I made a KiCAD schematic and PCB. After this, I compiled everything into an article to be published in the EFY magazine.

Objectives of the project: Prevent short circuit of battery and motor in EVs

Tool used: KiCAD (s/w)

Details of Papers/patents:N/A

Brief description of the working environment: The company has an easygoing environment. We are given a project and tasked to implement it. The mentor is very helpful. He explains every doubt very patiently.
One can expect to learn many things in the electrical and electronics domain, like electrical components, arduino, different ICs etc.

Academic courses relevant to the project: Electrical machines, microelectronic circuits.

Learning Outcome: Working of relay, better understanding of electric components and circuits.

PS-I station: Electrono Solutions , Bengaluru

Student

Name: PAVAN S V .(2021A3PS0810H)

Student Write-up:

PS-I Project Title: Smart Manufacturing Technologies

Short Summary of work done: I learnt and presented my findings through presentations on Advanced Human Machine Interfaces, Machine Learning algorithms used in SMT, CNC Machining and Programming and Data driven Decision Making and Optimisation. Basic overview of the topic, the implementation of the topic in an industrial setting, the benefits and disadvantages of the technique being used and some industrial examples pertaining to the topic were discussed in the presentations. I discussed two case studies per topic with corresponding hardware implementation/software simulation/video animation explaining about the topics' industrial uses. These were Furnace temperature control using IOT enabled HMI, Gesture controlled HMI, Decision Making and Predictive Maintenance using Decision Trees and Linear Regression, Fault Detection in production line using Image classification, CNC - Rapid Prototyping and usage of CNC Machining in

automotive industry. ML models were made on Google Colab, required videos were made on Canva platform, CNC simulation of a chess pawn was made on CNC Simulator Pro.

Objectives of the project: To learn about various techniques involved in Smart Manufacturing and Industry 4.0 and research about industrial case studies to further enhance the learning

Tool used: Microsoft Powerpoint

Details of Papers/patents:None

Brief description of the working environment: Working environment was conducive, with one mentor being assigned to 10 of the interns. Meets were held fairly regularly to check progress at each level. Expectations from the company were low and the same were met. I learnt to communicate more effectively and prepare apt PowerPoint presentations to convey information in a better way.

Academic courses relevant to the project: None

Learning Outcome: Learnt about Human Machine Interfaces, ML algorithms used in SMT, CNC Machining and Programming, Data driven decision making and optimisation

PS-I station: Electrono Solutions , Bengaluru

Student

Name: SIDDHANT SUSHIL SAWANT(2021A3PS1047G)

Student Write-up:

PS-I Project Title: Smart manufacturing

Short Summary of work done: Everyone was given a topic in the domain of smart manufacturing each week, which they had to research and present their findings and the following week they had to make 2 case studies showing digital technologies in action. That is they had to display either a hardware implementation or software simulation that showed the use of any two digital technologies in industry.

Objectives of the project: Research the impact of industry 4.0 on manufacturing

Tool used: Arduino, Thingspeak, Python, Matplotlib, Tinkercad

Details of Papers/patents:None

Brief description of the working environment: Friendly environment, expected more technical work and learnt presentation skills, arduino, path planning and impact of IoT in manufacturing

Academic courses relevant to the project: There was no direct implementation of academic knowledge in the topics that I was assigned.

Learning Outcome: Presentation skills, arduino, path planning and impact of IoT in manufacturing

PS-I station: Electrono Solutions , Bengaluru

Student

Name: PRIYANSHU SUMAN .(2021A3PS2445P)

Student Write-up:

PS-I Project Title: Smart Manufacturing Technologies

Short Summary of work done: Every week we were given a topic to research on and make a 15 slide PPT and then the consecutive week we had to present two case studies on the given topic. In all, we did 3 topic PPTs and 6 Case Studies.

Objectives of the project: Research on different industry 4.0 techniques

Tool used: H/w: N.A.; S/w: Python, Altium Circuit Maker, Matlab, Google Slides, Google Docs, Microsoft Teams

Details of Papers/patents:N.A.

Brief description of the working environment: This was an online PS - station. I felt that none of my courses at BITS, which I had learned by the time of this PS - 1, was of any use. All we had to do was do some online research on some topic for a week, and

then prepare 2 case studies for consecutive week. It didn't feel as if we had contributed anything to the company.

Academic courses relevant to the project: N.A.

Learning Outcome: Quality-Ensured Manufacturing Processes, Artificial Intelligence in Manufacturing, and Supply Chain Optimization & Demand Forecasting.

PS-I station: Electrono Solutions , Bengaluru

Student

Name: SUHAS K S .(2021A3PS2976H)

Student Write-up:

PS-I Project Title: Industry 4.0

Short Summary of work done: During the 8-week duration of the project, we focused on Industry 4.0 and organized it into four sets, each consisting of two weeks. In the first week of each set, our task was to research and compile relevant information on a specific topic related to Industry 4.0. At the end of the week, we presented our findings. The following week, we delved into practical applications by conducting two simulations or setting up working hardware related to the topic we previously researched. These simulations were done using various software tools, such as Tinkercad, Python, Arduino, and Fusion 360. To summarize we were exposed to different aspects of industry 4.0, tools for simulations and weekly presentations..

Objectives of the project: To understand, simulate and build different things used in industry 4.0

Tool used: Python-Sklearn, Arduino ,Tinkercad, Fusion 360,

Details of Papers/patents:-

Brief description of the working environment: It was a remote Internship , We had meetings of 1 hour few days a week to check our progress and we had weekly presentations for our specific assigned topics related to Industry 4.0. we were expected to attend the meetings and present our work .

Academic courses relevant to the project: -

Learning Outcome: Industry 4.0

IIOT

Smart Sensors

Data Driven Smart Manufacturing

AI

Python

Fusion 360

Arduino

Additive Manufacturing

Presentation

PS-I station: Electrono Solutions , Bengaluru

Student

Name: SHYAMGANESH RAVI .(2021A8PS3004H)

Student Write-up:

PS-I Project Title: Smart Manufacturing for Industry 4.0

Short Summary of work done: We researched about the various ways in which technologies is changing industrial manufacturing sector. With main focus on robotic systems and predictive maintenance.

Objectives of the project: To research various advanced in the field of Smart Manufacturing.

Tool used: Gazebo Simulation Software

Details of Papers/patents:Industry 4.0

Brief description of the working environment: Helpful working environment and good collaboration.

Academic courses relevant to the project: Control Systems

Learning Outcome: Industry 4.0, Predictive Maintenance

PS-I station: Electrono Solutions , Bengaluru

Student

Name: JAIDEEP RAMESH .(2021AAPS0537H)

Student Write-up:

PS-I Project Title: technologies used in smart manufacturing

Short Summary of work done: my project explored the role of technology in Industry 4.0 and i suggested a few key models that could be implemented in industries: augmented reality glasses and apps, bluetooth beacons, virtual reality headsets, edge gateway devices. These technologies showcase their applications across various industries, enhancing efficiency, safety, and decision-making. By embracing such technologies, businesses can harness the transformative power of Industry 4.0, achieving increased productivity, customization, and fostering innovation.

Objectives of the project: research on potential industrial applications of various technologies

Tool used: microsoft PowerPoint

Details of Papers/patents:nil

Brief description of the working environment: Electrono Solutions is a private Engineering consultancy that specializes in providing IIOT solutions. My project examined the utilization of augmented reality (AR), virtual reality (VR), radio frequency identification (RFID), IoT edge gateways, and Bluetooth beacons in the manufacturing industry, in line with Industry 4.0 principles.

Academic courses relevant to the project: electronic devices, microelectronic circuits

Learning Outcome: concepts and working of augmented reality, virtual reality, iot edge gateways, rfid technology

PS-I station: Electrono Solutions , Bengaluru

Student

Name: MODALI VENKATA SAI KRISHNA NIKHIL(2021AAPS0640H)

Student Write-up:

PS-I Project Title: Smart Manufacturing Technologies

Short Summary of work done: We worked on 3 different topics which ranged from Relays to Cyber-Physical Systems to SCADA. In the first week, we were made to research that particular topic and in the second week, we had to work out case studies of that topic in the manufacturing sector. We presented every Wednesday using PowerPoint slides and videos. For the topic of SCADA, I visited a nearby oil manufacturing industry to view their SCADA Systems. The presentations were reviewed by Dr. Sugumar and if any improvements were required he would suggest them and we had to redo the presentation with the updations. Each individual got a different topic every 2 weeks. Case studies may include a literature review of any journal or article, an Industry visit and the use of any real hardware or software model to simulate in real-time what the technology actually is. Throughout the internship, I worked on enhancing my professional skills, including time management, communication, and adaptability. Overall the work was time-taking but not exhausting as we got to know many things about Industry 4.0.

Objectives of the project: The main Objectives of this project were to focus on current technologies that are used in the field of manufacturing owing to the rise of Industry 4.0. I in particular have focussed on Electrical Relay Control, Cyber-Physical Systems and SCADA(Supervisory Control and Data Acquisition) Systems.

Tool used: PowerPoint, Premier Pro CC, Tinker-Cad, Arduino IDE.

Details of Papers/patents:None

Brief description of the working environment: Overall the working environment was pretty well managed with the help of Dr Sugumar and Faculty Prof Anirudh Udupa. We used to have daily meetings where we had to present to them our daily tasks as an individual. Dr Sugumar usually gives ideas about the topics assigned to us in-depth and gave our research an extra push and direction. As may be expected from an online working environment the communication would not be good, but it's not the case here.

My Peers along with other faculty from the company like Diya Roy and Vinutha Mam helped me throughout and helped in clearing my doubts. Expectations from the company were pretty much that we do the work we were assigned to us and always appreciated the ones who did it.

Throughout the internship, I acquired a deeper understanding of workplace professionalism and ethics. I learned the importance of meeting deadlines, maintaining confidentiality, and adhering to industry standards and regulations. I also developed problem-solving skills by actively participating in discussions and brainstorming sessions. I enhanced my ability to document and communicate technical information effectively. I learned to create detailed schematics, circuit diagrams, and reports, which are essential for sharing and presenting information within the team. I gained hands-on experience in prototyping electronic circuits using breadboards. I learned how to assemble components, create connections, and verify circuit functionality. I learned how to conceptualize, design, and simulate electronic circuits based on specific requirements and constraints. Working in a professional environment allowed me to improve my communication skills significantly. I learned how to effectively convey ideas, ask questions, and seek clarification.

Academic courses relevant to the project: Electrical Sciences, Electrical Machines, Electronic Devices, Control Systems.

Learning Outcome: I have got an in-depth understanding of the working of Relays, Cyber-Physical Systems and SCADA Systems. I also have got good experience working with microcontrollers like Arduino, and ESP-32 and their integration with different motors, sensors and thingspeak software. I have visited an Oil Manufacturing Industry to see their SCADA architecture which gave me a better exposure to these concepts.

PS-I station: Electrono Solutions , Bengaluru

Student

Name: BHAVAN L .(2021AAPS1583H)

Student Write-up:

PS-I Project Title: Smart Manufacturing

Short Summary of work done: Make ppt's on the content and case study for the given topic every two weeks.

Objectives of the project: Understanding the modern technologies in smart manufacturing

Tool used: Arduino

Details of Papers/patents:None

Brief description of the working environment: Online station

Academic courses relevant to the project: None

Learning Outcome: Understand about smart manufacturing and Improving my presentation skills

PS-I station: Electrono Solutions , Bengaluru

Student

Name: SHREYAN PRAKASH .(2021B5AA2352P)

Student Write-up:

PS-I Project Title: Smart Manufacturing

Short Summary of work done: During the course we were supposed to make presentation on a variety of topics related to smart manufacturing. My topics were 1) Manufacturing Automation 2) Digital Twins 3) Cobots and HRI. Where we were also supposed to make case studies in which we were supposed to apply the concepts learned in the making of the process where the instructor and the Station advisor guided us.

Objectives of the project: To learn and apply the various aspects of smart manufacturing and Industry 4.0

Tool used: Power point presentation, Python, Fusion 360, TinkerCAD

Details of Papers/patents:N/A

Brief description of the working environment: It was online work from home so working was quite breezy. The work itself was also enjoyable to a certain extent. The case studies were interesting to do.

Academic courses relevant to the project: Smart manufacturing. Electronics devices.

Learning Outcome: -Various technologies used in manufacturing Automation
-Technologies like Digital twins, PLCs, SCADA, Cobots etc.
-Application of Data analysis and AI/ML Modelling

PS-I station: Electrono Solutions , Bengaluru

Student

Name: TARUN SINGH .(2021B5AA3161H)

Student Write-up:

PS-I Project Title: Smart Manufacturing

Short Summary of work done: Making Presentation on a given topic and presenting it.

Objectives of the project: literature study of sub topics of smart manufacturing and presentation

Tool used: Powerpoint Presentation

Details of Papers/patents:None

Brief description of the working environment: Too laid back. They just expected a presentation that had the term manufacturing industry in it.

Academic courses relevant to the project: None

Learning Outcome: Learnt the efficiency increment from smart manufacturing no practical knowledge gained though

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: RISHABH RAJ JOSHI(2021A1PS2350G)

Student Write-up:

PS-I Project Title: Wear and tribocorrosion behaviour of Ti-based alloy in simulated nuclear reprocessing environment

Short Summary of work done: Did analysis on Ti grade 2 in nitric acid medium with and without NaF

Objectives of the project: Wear and tribocorrosion behaviour of Ti-based alloy in simulated nuclear reprocessing environment

Tool used: Origin for plotting graphs

Details of Papers/patents:Nil

Brief description of the working environment: Did analysis on Ti grade 2 in nitric acid medium with and without NaF

Academic courses relevant to the project: Nil

Learning Outcome: ..

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: Aditya H Iyer(2021A1PS2366P)

Student Write-up:

PS-I Project Title: Estimation of Specific Carbon-14 Radioactivity Levels in the Atmosphere Through Active and Passive Sampling Methodologies

Short Summary of work done: ^{14}C present in atmospheric CO_2 is measured by capturing CO_2 in a suitable chemical substrate and analysing it for ^{14}C activity. The absorption of CO_2 from the atmospheric air is carried out using a sodium hydroxide (NaOH) solution. The minimum amount of carbon required for the measurement of ^{14}C using a liquid scintillation counter is 1 gram (equivalent to approximately 3.7 g of CO_2). The sampling of atmospheric $^{14}\text{CO}_2$ can be carried out either by active sampling or by passive sampling techniques. This project will focus on optimising the amount of sorbent concentration to get the required amount of CO_2 absorption. The estimation of average ^{14}C -specific activity is the main objective of the project. This methodology would help in the determination of ^{14}C releases at nuclear sites, if any, and changes in the atmospheric-specific activity levels can also be monitored.

Objectives of the project: Quantifying the Atmospheric Radioactivity Emitted per Specific Mass of Carbon Present in the Atmosphere

Tool used: Don't understand

Details of Papers/patents: None yet

Brief description of the working environment: The sampling of CO_2 from atmospheric air has been done through either active or passive sampling techniques. In the active sampling techniques, $^{14}\text{CO}_2$ is collected in a chemical trap using a pump. Passive sampling relies on the spontaneous diffusion of analyte molecules from the air to the absorber. The advantage of passive sampling is that the analyte can be collected anywhere in the field of study by exposing the absorbent chemical to the atmosphere without the need for electrical power. The difference between active and passive sampling is that the first provides a more precise concentration of ^{14}C radioactivity (in Bq/m^3) in the air, while the second gives the specific activity level of carbon (in Bq/kg of carbon), which can be converted into units of concentration (Bq/m^3) by using a suitable calibration factor for the passive sampler.

Studies have reported the measurement of ^{14}C in atmospheric CO_2 using molecular sieves by passive sampling with a sampling duration of one month. Sampling methodologies that use molecular sieves require considerable skill and effort to recover the adsorbed CO_2 in molecular sieves for the measurement of ^{14}C using a combustive process at $400\text{--}500^\circ\text{C}$, and a cryogenic trapping method. On the other hand, a few studies have also reported a passive sampling method that uses sodium hydroxide (NaOH) solutions, but sampling conditions require optimisation to estimate atmospheric CO_2 levels accurately.

This study investigates the active and passive sampling methods in the vicinity of a nuclear power plant for ^{14}C measurements in atmospheric CO_2 using NaOH solution. The net amount of CO_2 absorbed in the sampling techniques depends on the sorbent medium's concentration, the dimensions of the sampler, and the duration of sampling. In this study, optimisation of the passive sampling method with regard to sampling duration, consistency of CO_2 absorption capacity, recovery of carbonate, and monitoring of ^{14}C activity levels in the atmospheric air is discussed.

Academic courses relevant to the project: Environmental Pollution Control

Learning Outcome: Designing chemical set-ups, learning about environmental radiation and safety, handling complex machines for spectrometry and scintillation counting, chemical labwork

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: BAIL DHARUN RAJESH .(2021A1PS2466P)

Student Write-up:

PS-I Project Title: Investigation of sedimentation characteristics of ADU

Short Summary of work done: Classified.

Objectives of the project: Preparation of ADU under various process parameters. Investigating the effect of settler diameter, settler height, overall volume solid fraction, concentration of uranium, particle size distribution on the sedimentation characteristics.

Tool used: Software: origin, matlab, excel hardware: advanced and elaborate lab equipment like fume hood, gas chromatography, spectrophotometer, pH meter etc.

Details of Papers/patents: Nil

Brief description of the working environment: A very good work life balance. Work hours from 9 to 5 with cell phones and all electronic gadgets not allowed to maintain

security. Very interested mentors and brilliant mentors. Received a project with real world applications.

Academic courses relevant to the project: Fluid mechanics, separation process, heat transfer

Learning Outcome: Real world application of topics like separation process and fluid mechanics

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: DATE KEDAR ANAND .(2021A3B52396P)

Student Write-up:

PS-I Project Title: THE DESIGN & SIMULATION OF MIXED ELECTRONIC CIRCUITRY FOR INTERFACING BEAM PROFILE MONITORS WITH ACCELERATOR CONTROL SYSTEM

Short Summary of work done: This report describes the design methodology and implementation of a control system for a Beam Profile Sensor for the 1.7MV Tandetron Particle Accelerator at the Material Sciences Group(MSG), Indira Gandhi Centre for Atomic Research(IGCAR). The Beam Profile Sensor gives an output of analog form, which is a measurement of the ions passing the sensor as it traverses the beam crosssection inside the accelerator tube. The circuitry designed aims to pass this signal to a computer for analysis. The design had to conform to the constraint of approximately real-time data transfer to facilitate the user to make changes to the beam profile and observe those changes in real-time. This project invloved the design and validation of various analog and digital components used in the whole system.

Objectives of the project: This report describes the design methodology and implementation of a control system for a Beam Profile Sensor for the 1.7MV Tandetron Particle Accelerator at the Material Sciences Group(MSG), Indira Gandhi Centre for Atomic Research(IGCAR). The Beam Profile Sensor gives an output of analog form, which is a measurement of the ions passing the sensor as it traverses the beam

crosssection inside the accelerator tube. The circuitry designed aims to pass this signal to a computer for analysis. The design had to conform to the constraint of approximately real-time data transfer to facilitate the user to make changes to the beam profile and observe those changes in real-time. This project invloved the design and validation of various analog and digital components used in the whole system.

Tool used: Arduino , LabVIEW

Details of Papers/patents:none

Brief description of the working environment: The Particle Irradiation Facility (PIF -I) under the Material Sciences Group(MSG) at Indira Gandhi Centre for Atomic Research(IGCAR), houses a 1.7 MV Tandem Accelerator and a in-house built 400 keV Linear Accelerator. This accelerator has the "tandem" configuration where negative ions generated by an ion source are first accelerated to the high voltage terminal and subsequently, the negative ions are converted to positive ions, while passing through a stripper canal filled with nitrogen gas. The same high voltage again accelerates the positive ions to ground potential. In addition to the advantage of using the same high voltage for accelerating the ions twice, the configuration has the added advantage that both the ion injection system and the target are at ground potential. Due to its versatile nature, the accelerator can be used for several applications ranging from ion implantation, ion irradiation, and ion beam analysis using techniques like Rutherford Backscattering Spectroscopy (RBS), ion channeling, Particle Induced X-ray Emission (PIXE) and Nuclear Reaction Analysis.

Academic courses relevant to the project: Digital Design, Microelectronic Circuits

Learning Outcome: Hardware and software

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: AKSHIT GROVER .(2021A3PS0258P)

Student Write-up:

PS-I Project Title: A Feasibility Measurement on Measuring Bio-Magnetic Fields Using Induction Coil and Fluxgate sensors

Short Summary of work done: The aim of this project is to construct an induction coil sensor and test its parameters using simulated bio-magnetic fields. Furthermore, these parameters are to be compared against that of a fluxgate sensor. This involves simulating and building analog circuits for source amplification and sensor amplification. Further, the induction coil is to be tested both inside and outside a magnetically shielded room, where its parameters are to be measured and calibrated against theoretical calculations made for these parameters.

Objectives of the project: The aim of this project is to design and develop an induction coil sensor based circuitry and test its parameters (i.e Sensitivity) using simulated bio-magnetic fields. The tested parameters are to be compared against those of a fluxgate sensor.

Tool used: Tina-TI software, LT-Spice Software, PCBs, LM358, INA122, Resistors, Capacitors, Soldering iron, Flux, Fluxgate sensor,

Details of Papers/patents:None so far, possibility existent

Brief description of the working environment: Pleasant area to work in. Due to multiple restrictions inside the facility, organisation tends to work very much obstructed. Resources are constrained by time of processing. Hands on experience was very good.

Academic courses relevant to the project: Microelectronic circuits, Electrical Sciences, Electromagnetic theory, Electrical machines

Learning Outcome: Learned about different ICs and noise cancellation techniques, Magnetocardiography, functioning of low magnetic field sensors

PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) , Kalpakkam

Student

Name: CHINMAY SOGANI(2021A3PS1148G)

Student Write-up:

PS-I Project Title: Real Time Length Measurement of Chopped Nuclear Fuel using Machine Learning and its Hardware Implementation

Short Summary of work done: The main requirement of the project was to detect the length of the fuel pin that was being cut in real-time, but there were actually three problem statements to tackle, first is the detection of the fuel pin from the feed, second to implement length measurement and the third is to implementation of code on raspberry pi in real-time.

Objectives of the project: In the Reprocessing plant, nuclear fuel pins are cut into small pieces using the chopper and then dissolved in Nitric Acid. One of the major factors which decide the total time for dissolution is the length of the chopped fuel pins. So, it is important that the pins are cut at a predefined length. Various conventional image processing techniques and neural networks can be used to detect the length of the pins to be cut. A comparative study on various techniques will also be carried out. The analysis is to be carried out using video files and then demonstrated in real-time. Python and OpenCV will be used for this application. Finally, code has to be implemented in hardware (Raspberry Pi) with a real-time camera feed from a camera connected to DVR.

Tool used: S/w : Python, YOLO, OpenCV, RTSP; H/w : Raspberry Pi3 +, Raspberry i 4 model B, DVR, Coaxial Pin hole Camera,

Details of Papers/patents:In progress

Brief description of the working environment: Everything was very smooth got to learn a lot especially since i had no experience working with OpenCV.

Academic courses relevant to the project: Computer Programming, MuP

Learning Outcome: Python, OpenCV, Machine Learning, Raspberry Pi, pyqt5, Object Detection, YOLOv8

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: PULKIT DEEPAK SINGLA(2021A3PS2588G)

Student Write-up:

PS-I Project Title: Design and Development of an Ion Chromatography Instrument using Single Board Computer Raspberry Pi

Short Summary of work done: During my internship, I was assigned to a project titled "Design and Development of an Ion Chromatograph Instrument using a Raspberry Pi." The primary goal of the project was to create a fully functional Ion Chromatograph Instrument, and my responsibilities involved developing a user-friendly Graphical User Interface (GUI) for controlling the setup and integrating various hardware components with the Raspberry Pi. Working independently with guidance from mentors, I delved into the existing work to continue the project's progress seamlessly. I thoroughly studied the documentation, code, and designs to gain a comprehensive understanding of the project's requirements and objectives. A major accomplishment during my internship was the successful development of the GUI. I enhanced and refined the existing interface to ensure ease of use and efficient control of the Ion Chromatograph Instrument. The GUI allowed for real-time monitoring of the chromatography process and easy configuration of the setup. Additionally, I focused on integrating the Raspberry Pi with different hardware components, including sensors, pumps, and valves. By building upon the work of previous team members, I ensured smooth communication and coordination between the Raspberry Pi and these peripherals. This enabled the instrument to gather accurate data and perform reliably during experiments. Overall, my internship experience provided valuable insights into collaborative development, version control, and the importance of proper documentation in long-term projects. It also allowed me to strengthen my problem-solving skills and gain hands-on experience with software development and hardware integration.

Objectives of the project: Use a Raspberry Pi to create a fully functional Ion Chromatograph Instrument for chemical analytical application in industries

Tool used: Python, Raspberry Pi, Arduino Uno, MAX3223 IC

Details of Papers/patents:NoneNone

Brief description of the working environment: The company provided a supportive and encouraging environment for learning. I had the chance to apply my knowledge to real-world projects, and they trusted me with important tasks.

I expected to gain practical experience and improve my skills during the internship, and I wasn't disappointed. Building the Ion Chromatograph Instrument with the Raspberry Pi taught me a lot. I learned how to create a user-friendly interface and connect various hardware components to the Raspberry Pi.

Working on the project independently helped me become more adaptable and self-reliant. I faced challenges but learned how to solve them on my own. The experience also gave me insights into project management and collaboration.

Overall, the internship was a great learning opportunity. It exceeded my expectations, and I feel more confident and prepared for future projects in the field of analytical instrumentation.

Academic courses relevant to the project: None

Learning Outcome: GUI Development, Serial Communication, Python, Raspberry Pi

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: ARYAN GARG .(2021A3PS2641P)

Student Write-up:

PS-I Project Title: Design of high speed induction motor and drive for FRP

Short Summary of work done: We designed a high speed high torque induction motor for use as a centrifuge. The motor has severe size and thermal limitations, so the design process needed to account for that. Mainly the work consisted of simulating various designs by using parameters found through analytical methods, and then validating the simulations with the reference designs. The process continues for many iterations with gradual improvement.

Objectives of the project: End to end design of a high speed high duty induction motor

Tool used: ANSYS Maxwell, Motor-CAD, MATLAB, ANSYS TwinBuilder

Details of Papers/patents:None, all data classified

Brief description of the working environment: Best environment for scientific work. There are no phones, so you are forced to really think about the project all the time, and so you can make good progress every day and return to room with a sense of fulfilment and accomplishment.

Academic courses relevant to the project: Electrical Machines, Electromagnetic theory, Microelectronic Circuits, Control Systems, Power Systems

Learning Outcome: Motor design, electromagnetics, ANSYS, Motor drivers

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: ARYAN THAKUR(2021A4A82714G)

Student Write-up:

PS-I Project Title: Simulation of fire in an enclosure using fire dynamics simulator

Short Summary of work done: I had to model a room housing cables and then see how ignition location in the room influences the fire behaviour.

Objectives of the project: To determine if ignition location impacts the way fire spreads

Tool used: Fire dynamics simulator (FDS)

Details of Papers/patents:None

Brief description of the working environment: Working environment was very good, the expectations were met and I learnt how to deal with the real world

Academic courses relevant to the project: CFD

Learning Outcome: Yes, ignition location does impact the fire behaviour

PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam

Student

Name: SHAH RUTESH MANOJ .(2021A4PS0332P)

Student Write-up:

PS-I Project Title: Simulation of Thermal Stratification in Outlet Plenum of FFTF During LOFWOS Test#13

Short Summary of work done: This work features steady state and transient simulation of thermal stratification in the outlet plenum of the Fast Flux Test Facility (FFTF). FFTF was the sodium cooled nuclear reactor owned by the U.S. Department of Energy. The reactor tested nuclear fuels, materials, components, power plant operations and maintenance protocols and nuclear safety designs. Loss of Flow Without SCRAM (LOFWOS) Test # 13 was conducted in the reactor towards demonstration of passive reactor safety. 2D axi-symmetry thermal hydraulics study was carried out using CFD to demonstrate the numerical methodology to establish the thermal stratification issues in the fast reactors

Objectives of the project: The objective of the report is to estimate the evolution temperature of sodium in the plenum. The results obtained from the simulation are compared against the experiment data and validated.

Tool used: Ansys Fluent, Ansys Workbench.

Details of Papers/patents: IHMTC2023. Title : Numerical Establishment of Thermal Stratification in the Outlet Plenum of FFTF during LOFWOS test#13

Brief description of the working environment: The mentors are very helpful and up-to-date workstations.

Academic courses relevant to the project: Fluid Mechanics, Heat Transfer

Learning Outcome: established that 2D simulations can be carried for 3D complicated parts to save time and computational power.

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: PEDDIREDDY VISHNU VARDHAN REDDY(2021A4PS1199G)

Student Write-up:

PS-I Project Title: Design and Kinematic Modeling of a 4 DOF Scara Robot.

Short Summary of work done: I learnt to make simulations in Matlab and ROS.

Objectives of the project: To design 4 DOF Scara Robot and to simulate the robotic arm

Tool used: Matlab,ROS

Details of Papers/patents:None

Brief description of the working environment: The working environment was good but the software i needed to do the simulations wasn't available in the facility. I took permission and had to work from room most of the time.

Academic courses relevant to the project: BITS F441 Robotics

Learning Outcome: I learnt to simulate in matlab and ROS

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: AADITH S WARRIER .(2021A4PS1404P)

Student Write-up:

PS-I Project Title: Development of Visual Inspection Tool for Hard-To-Reach Areas

Short Summary of work done: During the creation of a soft actuator for an inspection tool, I embarked on an exciting journey. Employing silicone rubber as the primary material, I utilized wire EDM and 3D printing techniques to craft the mold, expertly designed through Fusion 360. Subsequently, the actuator's performance was meticulously simulated and analyzed using ANSYS, ensuring optimal functionality. This multidisciplinary approach enabled me to achieve a successful outcome, providing the inspection tool with a versatile and efficient soft actuator for various applications. The project demonstrated the power of cutting-edge technologies combined with innovative design, resulting in a rewarding and fulfilling experience.

Objectives of the project: Make a visual inspection tool

Tool used: Fusion 360, Ansys

Details of Papers/patents:-

Brief description of the working environment: Work culture at IGCAR is collaborative and team-oriented.

Researchers feel valued and respected.

There is flexibility and autonomy in work.

There are opportunities to learn new skills.

Academic courses relevant to the project: -

Learning Outcome: Learnt to design for advanced manufacturing techniques

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: JONISH ABISHECK J(2021A4PS1743G)

Student Write-up:

PS-I Project Title: Simulation of operational transient performed during startup tests of superphoenix reactor using PINET code

Short Summary of work done: I have simulated the superphoenix nuclear reactor located in France. Validated the PINET code results against experimental data.

Objectives of the project: Validation of PINET code

Tool used: Python, excel

Details of Papers/patents:IHMTC 2023 conference publish.

Brief description of the working environment: it was very useful and i learned a lot. I got a very good mentor. It was very different experience since no electronics is allowed inside. It was fun.

Academic courses relevant to the project: Heat transfer, fluid mechanics

Learning Outcome: Usage of cofing in simulation

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: INIYA ADHITHYA J .(2021A4PS2350P)

Student Write-up:

PS-I Project Title: Simulation of Operational Transients Performed During Startup Tests of Superphénix Reactor Using PINET Code

Short Summary of work done: in my work here I have model the Superphénix Reactor, simulated 6 transients condition, compared the results with the actual measured data and wrote a conference paper on my work.

Objectives of the project: To validate PINET code using the SPX benchmark test.

Tool used: Python, PINET

Details of Papers/patents:none

Brief description of the working environment: It had professional working environment, there was no electronics things allowed inside for security reason. they expected me to have some coding background and know basics of heat transfer.

Academic courses relevant to the project: heat transfer, fluid mechanics

Learning Outcome: learned to model a nuclear reactor core and learned how to write a conference paper

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: ANSHAL MUHAMMED(2021A4PS2651G)

Student Write-up:

PS-I Project Title: MODELLING AND SIMULATION OF CAPACITIVE AND INDUCTIVE SENSING ELECTRODES FOR VIRTUAL PROTOTYPING OF VOID FRACTION SENSORS IN LIQUID SODIUM

Short Summary of work done: For the first week, I did research different types of sensors and their working principles. I modelled different types of sensors in COMSOL multi-physics FEA software and checked the feasibility of the models.

Objectives of the project: To model and simulate a capacitance-based void fraction sensor

Tool used: COMSOL multi physics software, MathLab, R, lathe and grinder

Details of Papers/patents:nothing as of now

Brief description of the working environment: It was very good the faculties and the mentors were very useful they guided me very well.

Academic courses relevant to the project: ES

Learning Outcome: Aspects of how sensors work, using of many softwares

PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) , Kalpakkam

Student

Name: MANNAN DHIR(2021A4PS2887G)

Student Write-up:

PS-I Project Title: Stress-Strain Relationship Profiling from Nano-indentation

Short Summary of work done: At IGCAR, my main task was conducting a comprehensive study on the stress-strain profiling of thin films through nanoindentation using the Anton Paar system. I was involved in the advanced data analysis which helped me understand the crucial role of grain size in the transition from elastic to plastic deformation. I also explored the complexities of elastoplasticity and offered insights into material response under various loads.

Objectives of the project: To obtain Stress-Strain Graph from the process of Nanoindentation for materials using various types of indenters and using Anton-Paar System

Tool used: The primary hardware used during my project was the Anton Paar system for nanoindentation. In terms of software, I extensively used data analysis tools such as Origin Pro to understand and interpret the results of the experiments.

Details of Papers/patents: No papers or patents were produced as a direct result of my work during the internship period, but my thesis or report will be stored in the IGCAR database for future work.

Brief description of the working environment: The working environment at IGCAR was a unique blend of academia and professional industry standards. It taught me discipline, instilled a strong work ethic, and exposed me to the realities and challenges faced by scientists working tirelessly for national projects. I had the opportunity to learn from experts like Dr. Ramaseshan and labmates Balamurugan and Thenamudan. The organization expected high-quality work, punctuality, and active learning, which, combined with my exposure to Tamil culture and interaction with BITSians from different campuses, made this a comprehensive learning experience, I would say it is as close you can experience of having a proper 9-5 job while being in college.

Academic courses relevant to the project: Introduction to Solid State Chemistry, Material Science

Learning Outcome: During my time at IGCAR, I gained invaluable practical experience and developed a deep understanding of stress-strain profiling using the Anton Paar system, particularly in thin films. I also honed my skills in using different analytical software and gained insights into the roles of grain size in the transition from elastic to plastic deformation in materials also learned about XRD. The importance of balancing work and personal life was a valuable lesson learned, also got to learn about LaTeX in this process.

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: MACHAMMAGARI NIKHILESWAR REDDY(2021A7PS2911G)

Student Write-up:

PS-I Project Title: Abnormality detection in images using Deep Learning Techniques

Short Summary of work done: Detecting abnormal patterns or anomalies in images plays a crucial role in various domains, such as medical diagnostics, surveillance, and quality control. Traditional approaches often rely on handcrafted features and lack the ability to capture complex patterns, limiting their effectiveness. In recent years, deep learning models have shown remarkable success in various computer vision tasks, including abnormality detection. This project report presents an in-depth investigation into abnormality detection in images using deep learning techniques. The primary objective was to develop a robust and accurate abnormality detection system capable of identifying deviations from normal patterns within diverse image datasets. This project utilised a Convolutional Neural Network (CNN) architecture as the foundation for abnormality detection. The CNN was trained on a large-scale dataset comprising both normal and abnormal images. Transfer learning techniques were employed to leverage the power of pre-trained models, specifically using convolutional layers from state-of-the-art architectures such as VGG16.

Objectives of the project: To build a robust and accurate system. 2. Deep Learning techniques 3. The system can learn complex patterns and features from a large dataset. 4. Enabling it to generalize and detect abnormalities in previously unseen images.

Tool used: S/w - Spyder, Google CoLab

Details of Papers/patents:NA

Brief description of the working environment: My work place is computer lab. Good projects. Improvement in Presentation skills.
Developed writing skills report and survey paper.

Academic courses relevant to the project: Deep Learning.

Learning Outcome: Learnt Python 3 syntax.
Learnt about libraries involved in Deep Learning.
Developed skills in Deep Learning.
Got familiar with Convolutional Neural Networks (CNNs).
Learnt how to use Google CoLab.
Improvement in Presentation skills.
Developed writing skills report and survey paper.

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: VIKAS DHANANJAY DUBEY(2021A8PS2031G)

Student Write-up:

PS-I Project Title: Porting and Optimization of VHDL-based TCP Communication IP for Flash-Based FPGA Platforms

Short Summary of work done: This project involved the porting and optimization of a VHDL-based TCP communication IP, originally designed and tested on SRAM-based Xilinx FPGAs, to Flash-based FPGA platform, IGLOO2-M2GL010T-FG484. The project involved the porting of the VHDL-based IP, migration of the existing wrapper logic, and comprehensive optimization of the entire logic design.

Objectives of the project: To enhance the IP's reliability and evaluate its performance across diverse FPGA platforms.

Tool used: Libero SoC, Xilinx ISE

Details of Papers/patents:No

Brief description of the working environment: Mobile phones or any electronic gadget was not allowed, so it was a good experience. All the officers were supportive and very helpful.

Academic courses relevant to the project: Digital Design

Learning Outcome: Hands-on experience in various aspects, including VHDL code porting, rigorous design verification, and efficient implementation. Acquired valuable skills in FPGA-based IP adaptation, optimization techniques, and FPGA platform compatibility.

PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) , Kalpakkam

Student

Name: ADITYA MAJUMDAR .(2021AAPS0286P)

Student Write-up:

PS-I Project Title: Tactile Sensing using Force Sensing Resistor (FSR) Matrix for a robot

Short Summary of work done: The setup for this project includes a voltage divider circuit, an analog-to-digital converter, a UART-to-USB transmitter, and a microcontroller. The microcontroller is programmed to coordinate all the other components. The FSRs are then calibrated using standard weights, with all the data sent to the LabVIEW application on the computer. A final Calibration Curve is also made for the same.

Objectives of the project: Force Sensing Resistors (FSRs) are an interesting tool that can be used for Tactile Sensing. This project aims to make use of six FSRs in a matrix to sense forces. The setup for this project includes a voltage divider circuit, an analog-to-digital converter, a UART-to-USB transmitter, and a microcontroller. The microcontroller is programmed to coordinate all the other components. The FSRs are then calibrated using standard weights, with all the data sent to the LabVIEW application on the computer. A final Calibration Curve is also made for the same.

Tool used: C programming, LabVIEW

Details of Papers/patents:None.

Brief description of the working environment: The working environment is very intense, which motivated me to give my best for this project. The members of the organization are very supportive and cooperative. The equipment here is extremely good. The mentors and guides are committed to excellence and have extensive knowledge of their fields. This PS station is probably the only one where I could have got knowledge about the country's nuclear program and how reactors work.

Academic courses relevant to the project: Microprocessors and Interfacing, Digital Design

Learning Outcome: Surveyed about sensors and their applications. Learned to use microcontrollers and program them using C programming. Learned about interesting components of digital components, such as UART communication, Analog-to-Digital converters and Printed Circuit Boards.

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: SRIJITH K .(2021AAPS2233H)

Student Write-up:

PS-I Project Title: Automation of Optocoupler Degradation Platform and data modelling

Short Summary of work done: The project deals mainly on predicting the CTR ratio of an Optocoupler based on Machine learning, by using pre existing datasets which were retrieved by the set-up in the laboratory. An LSTM model was built on python for testing and training.

Objectives of the project: To build a Machine Learning based model to predict the CTR ratio of an Optocoupler using primary side parameters

Tool used: Python 3.0 (Anaconda), Optocouplers, Analog to Digital Converters

Details of Papers/patents: To be published soon

Brief description of the working environment: The working environment is different in IGCAR since no electronic devices are allowed inside. A very knowledgeable set of instructors were allotted.

Academic courses relevant to the project: Machine Learning

Learning Outcome: Machine Learning, Prognostics

PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) , Kalpakkam

Student

Name: RISHI VARDHAN ARIPIRALA .(2021B4A33153H)

Student Write-up:

PS-I Project Title: Developing HMI, using real time SCADA platform, to integrate Chartless recorders installed in FBTR control room

Short Summary of work done: I connected 2 chartless recorders to my PC using ethernet cables and switch, then established a Modbus TCP/IP protocol and read and wrote data in real time(used a source meter to test this). Then i Setup a Database(Microsoft SQL) and stored all the data collected from recorder in it and finally developed a GUI to show and analysis trends.

Objectives of the project: Connecting and establishing protocol's between Pc and Recorders, then set up a database to store the data. Finally, design a GUI.

Tool used: 2 Chartless recorders which I connected to my PC using a switch.Elipse E3 software used as my SCADA software

Details of Papers/patents:NONE

Brief description of the working environment: It was a very good experience for students like us, a very supporting guide's who were ready to solve our difficulties anytime and pushed us ahead, helped to build up a attitude towards challenges in work. I expected a similar environment from IGCAR, but the only problem was that few students like me didn't know much about the project earlier, I started everything from scratch and finished with my mentors help.

Academic courses relevant to the project: None

Learning Outcome: Learnt a lot about Computing networks and communication protocols

PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) , Kalpakkam

Student

Name: AKASH SINGH .(2021B5A30904P)

Student Write-up:

PS-I Project Title: Vertical Bridgman growth of semiconducting CdMnTe crystals for gamma ray detection application

Short Summary of work done: During PS-I, I had the incredible opportunity to work on the project titled "Vertical Bridgman Growth of Semiconducting CdMnTe Single Crystals for Gamma Detector Applications" at the Material Science Group, IGCAR. The primary objective of the project was to explore the growth and synthesis of CdMnTe crystals using the Vertical Bridgman method and investigate their potential application as gamma detectors. Throughout the project, I was actively involved in various tasks, including crystal growth experiments using the Vertical Bridgman apparatus. I learned to handle the intricate process of growing crystals with precise control over growth conditions and temperature. Characterization techniques played a crucial role in evaluating crystal quality, and I gained practical experience in X-ray diffraction, Raman spectroscopy, and optical microscopy. These methods helped me analyze crystal structure, defects, and composition, providing valuable insights into the properties of CdMnTe crystals. Furthermore, I conducted extensive analysis using gamma ray spectroscopy to assess the crystal's performance as a radiation detector. This involved evaluating energy resolution, spectral response, and energy calibration to determine its suitability for gamma ray detection. My work during PS-I allowed me to integrate concepts from Physics and Electronics and provided me with hands-on experience in a research laboratory. I developed essential skills in problem-solving, data analysis, and scientific communication while contributing to advancements in semiconductor materials for gamma ray detection applications.

Objectives of the project: The objectives of the project "Vertical Bridgman Growth of Semiconducting CdMnTe Single Crystals for Gamma Detector Applications" are as follows: 1. Crystal Growth: The primary objective of the project is to grow high-quality single crystals of CdMnTe using the Vertical Bridgman method. This involves controlling the growth conditions, temperature gradients, and cooling rates to obtain large, defect-free crystals with precise compositions. 2. Characterization: Another objective is to characterize the crystal quality and properties. Various techniques like X-ray diffraction, Raman spectroscopy, and optical microscopy will be employed to assess the crystal structure, composition, and morphology. 3. Gamma Detector Applications: The main focus of the project is to evaluate the suitability of CdMnTe crystals for gamma ray

detector applications. The crystals will be assessed for their spectral response, energy resolution, and efficiency in detecting gamma rays. 4. Defect Analysis: An important objective is to analyze the defects present in the crystals and understand their impact on the crystal's performance as a gamma detector. 5. Optimization: The project aims to optimize the crystal growth process and experimental parameters to enhance the crystal's overall performance as a gamma detector. 6. Technological Advancements: The research also seeks to contribute to the advancement of semiconductor crystal growth techniques and materials for radiation detection, which has applications in fields like nuclear physics, medical imaging, and national security. 7. Scientific Contribution: Lastly, the project aims to make a scientific contribution by gaining insights into the properties and behavior of CdMnTe crystals under gamma radiation, which can further the understanding of semiconductor materials for future advancements in radiation detection technologies.

Tool used: Hardware Tools: 1. Vertical Bridgman Apparatus 2. Vacuum Glove Box 3. Furnace Software Tools: 1. X-ray Diffraction (XRD) Software 2. Raman Spectroscopy Software 3. ImageJ 4. Gamma Spectroscopy Software 5. Finite Element Analysis (FEA) Software

Details of Papers/patents:No

Brief description of the working environment: During PS-I at the Material Science Group, IGCAR, I was immersed in a highly stimulating and collaborative working environment. The team of experts and researchers provided valuable insights and guidance throughout the project, which focused on investigating the vertical Bridgman growth technique for synthesizing CdMnTe single crystals and exploring their potential for gamma detector applications.

The lab had high expectations from interns, encouraging us to actively contribute to ongoing research projects. My responsibilities included assisting in crystal growth experiments, sample preparation, and performing various characterization techniques. I had the opportunity to work with crystal growth apparatus, vacuum systems, and different analytical tools like X-ray diffraction, Raman spectroscopy, and FTIR transmittance.

Throughout PS-I, I honed my technical skills and problem-solving abilities, learning the significance of meticulous data analysis and maintaining accuracy in experimental work. Working in a professional research environment also exposed me to teamwork, effective communication, and time management.

My PS-I at Material Science Group, IGCAR, provided an exceptional learning journey that deepened my understanding of crystal growth techniques and semiconductor materials. I am grateful for the invaluable experiences and knowledge gained during this internship, which will undoubtedly play a crucial role in shaping my future academic and professional pursuits.

Academic courses relevant to the project: 1. General Chemistry: This course provided a solid foundation in understanding chemical reactions and crystal structures, which are essential in studying the properties of CdMnTe crystals.

2. Introduction to Nanoscience: This course introduced me to nano

Learning Outcome:

1. Understanding of Crystal Growth Techniques: Through this project, I gained valuable insights into the intricate processes involved in the Vertical Bridgman growth of CdMnTe single crystals. I learned about temperature control, growth conditions, and crystal quality optimization.
2. Characterization Techniques: I acquired hands-on experience in various characterization techniques, including X-ray diffraction, Raman spectroscopy, and optical microscopy. These methods helped me analyze crystal structure, composition, and defects.
3. Gamma Detector Applications: The project exposed me to the practical aspects of gamma ray detector applications. I learned how to evaluate crystal performance, energy resolution, and spectral response for radiation detection.
4. Problem-Solving and Research Skills: Throughout the project, I honed my problem-solving skills and research abilities. Analyzing data, troubleshooting issues, and drawing meaningful conclusions became integral parts of my work.
5. Interdisciplinary Knowledge: Working on this project allowed me to integrate concepts from different fields like Physics and Electronics, broadening my understanding of semiconductor materials and their applications.
6. Collaboration and Communication: Collaborating with experts in the field enhanced my teamwork and communication skills. I learned how to effectively present complex findings and ideas to both technical and non-technical audiences.
7. Practical Application of Theory: The project enabled me to apply theoretical knowledge gained during my academic studies to real-world applications, bridging the gap between theory and practical implementation.
8. Research Ethics and Methodology: Conducting research in a professional setting taught me the importance of research ethics, data integrity, and adherence to scientific methodologies.

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: VEDAANT ACHUTHAN(2021B5A41173G)

Student Write-up:

PS-I Project Title: Ambient Kelvin Probe Force Microscopy

Short Summary of work done: Learnt principles of AFM and KPFM. Used an AFM to conduct KPFM on doped Si samples and found their work function.

Objectives of the project: To find the work function of conducting samples using AFM-KPFM

Tool used: None

Details of Papers/patents:None

Brief description of the working environment: Work environment was very calm and peaceful.

Academic courses relevant to the project: None

Learning Outcome: Learning the principles and operation of an AFM setup, Surface properties of materials.

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: MRIDUL MISHRA(2021B5A42367G)

Student Write-up:

PS-I Project Title: Microstructural Characterization Of Sodium Exposed SS316 Steel.

Short Summary of work done: Liquid sodium is used as coolant in the fast breeder test reactor of which core reactor material is mainly SS316LN stainless steel. Therefore I was required to analyze the superficial changes on the surface of SS316LN steel with help of Electron Microscopy and corroborate the findings with the predictions. Work involved heavy usage of Scanning Electron Microscope and other tools like Energy dispersive X ray spectroscopy to look at the surface at the microlevel under very high magnifications and find the elemental composition changes if any, produced due to sodium exposure.

Objectives of the project: Characterize and analyze the behaviour of type SS316LN nuclear grade steel when exposed to very high temperature sodium environment, with the help of Scanning Electron Microscope

Tool used: Scanning Electron Microscope, Energy dispersive X ray spectroscopy

Details of Papers/patents:None

Brief description of the working environment: Very diverse and dynamic working environment. Project involved inputs and learning experience from several members of the department which does research on physical metallurgy. Mentor was very helpful and promptly clarified all doubts. Director of the division(physical metallurgy) was also heavily interested in my project and constantly kept a keen eye on the progress. Learned a very valuable skill of using a scanning electron microscope and also learnt some things about Transmission electron microscope. Working Microscopy laboratory is very lavishly built with state of the art tools at disposal.

Academic courses relevant to the project: Materials science, solid state physics

Learning Outcome: Microstructural analysis, metallurgy, solid state physics, Scanning Electron Microscopy

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: SALMAN FARIS(2021B5A70745H)

Student Write-up:

PS-I Project Title: Modelling axial field distribution of multi-layer electromagnetic coils of various geometries with DC and AC current excitations using analytical and finite element models.

Short Summary of work done: I started off by learning how to use COMSOL for the first two weeks. Then I measured the dimensions of a coil and modelled it on COMSOL.

Several errors had to be corrected. Then I took the plots of magnetic fields and graphed it using Origin. This took the next two weeks. Then I improved on the previous models and took models of coils of other shapes, and made more graphs for the next two weeks. For the final two weeks, I compiled the data to get the report and also did some basic analytical solving (pen and paper derivations)

Objectives of the project: To get the distribution of magnetic field along various regions for coils of various geometries using both finite element methods (numerical analysis using COMSOL software) as well as analytically (pen and paper, and later using Python),

Tool used: COMSOL, Origin

Details of Papers/patents: Writing an abstract for a conference poster for ICMAGMA (International Conference on Magnetic Materials and Applications)

Brief description of the working environment: Most of the work is done sitting in one room using a computer. The working hours were long. On many days, I could get home only at 9 pm (and I start from home at 9 am). The expectations are somewhat flexible if you are unable to do what they asked, but you are required to spend a considerable amount of time working on it first. Since everyone there already worked full days, they couldn't pay much attention to me, which delayed my progress.

Academic courses relevant to the project: Electrical Sciences (EEE F111), Electromagnetic Theory I (PHY F212)

Learning Outcome: Learned COMSOL modelling, learned to write reports, understood the functioning of an atomic research station, got experience travelling and living away from home.

**PS-I station: Indira Gandhi Centre for Atomic Research (IGCAR) ,
Kalpakkam**

Student

Name: VAIDIK A SHARMA .(2021B5A82509P)

Student Write-up:

PS-I Project Title: Time Series Prediction using Quantum Neural Networks and Deep Learning Algorithms based on past measurements

Short Summary of work done: The project investigates the application of quantum computing techniques involving QNN or quantum neural networks in time series metrological predictions, with a specific focus on enhancing prediction potential through variational parameter estimation. It explores the utilization of quantum simulations and quantum metrology techniques to model complex physical systems and achieve precise measurements. The effects of different parameter distributions and learning rates on parameter estimation are examined, considering their impact on optimizing the state of the system. The project discusses various methods such as Hamiltonian simulation, the product formula method, and the time block method to model system evolution and minimize simulation errors. The accuracy boundations of the simulation is evaluated using the Schatten-infinite norm. The methodology aims to optimize parameter estimation by maximizing accuracy while minimizing resource requirements, employing mathematical tools like the Cramer Rao Bound and Fischer Information. A comprehensive four-step process for information extraction using parameterized quantum circuits is presented. It also presents a comparative analysis with most accurately developed classical deep learning algorithm like LSTM or long short term memory. The research significantly contributes to the advancement of quantum metrology and sensing by exploring variational unitary circuits and optimized parameter estimation for more precise predictions. The findings provide valuable insights into parameter distributions and learning rates, enabling the development of more suitable approaches in quantum computing.

Objectives of the project: Project aims to advance quantum metrology and sensing by optimizing parameter estimation using variational unitary circuits, providing valuable insights for quantum computing advancements.

Tool used: Python – Programming Language for Data Extraction and Analysis; Jupyter, Spyder – Environments Worked Upon; Tensorflow, Keras – Classical LSTM Modelling Libraries Used; Qiskit, Google Cirq, openQASM 2.0 – Quantum Programming Languages Used; PennyLane – QN

Details of Papers/patents:Title -Techniques to Variational Quantum Metrology using Optimized Parameter Estimation.

Authors- Vaidik Avnish Sharma (Presenting),N Madurai Meenachi ,Varad Laxmikant Bidwai.

Poster presentation in- European Quantum Technologies Conference 2023, Submissi

Brief description of the working environment: The institute provided me with access to cutting-edge technology and resources necessary for my research work. The institute had positive expectations from its interns, which included actively participating in research discussions, conducting experiments, analyzing data, and contributing to the project's objectives. I was expected to demonstrate a strong understanding of quantum computing principles and techniques, as well as a willingness to learn and adapt to new concepts.

The institute emphasized the importance of attention to detail, accuracy in data analysis, and effective communication of findings. I was encouraged to think critically, and propose innovative ideas to improve the project's outcomes. Furthermore, the company expected to meet project deadlines, manage time efficiently, and interact collaboratively with the mentor. It encouraged a collaborative and supportive work environment, where ideas were openly shared and feedback was given constructively. Overall, the working environment fostered a growth mindset, encouraged continuous learning, and provided ample opportunities to contribute meaningfully to the project's objectives.

Academic courses relevant to the project: BITS F386- QUANTUM INFORMATION AND COMPUTING, MATH F113- PROBABILITY AND STATISTICS, CS F111- COMPUTER PROGRAMMING.

Learning Outcome: Quantum Neural Networks (QNN) hold significant promise in solving complex problems and leveraging quantum computation for deep learning tasks. In comparison to classical deep learning algorithms like recurrent neural networks and long short term memory, study of outcomes through successive stages of development, QNNs offer unique advantages in terms of parallel processing, improved representational power, and optimization capabilities.

PS-I station: Integrated Active Monitoring Pvt Ltd , Pune

Student

Name: SAKAR HIRDE .(2021A3PS3203H)

Student Write-up:

PS-I Project Title: Ticketing System Analysis and Database Analysis for Access Control

Short Summary of work done: Our project aimed to develop a dashboard containing analyzed data in a simplified manner for our seniors at IAM on platforms like Metabase and Grafana. The primary goal was to increase efficiency and reduce costs, and facilitate management in the ticketing system. To achieve this, we established a strong basic knowledge of all software, SQL Language, and other platforms. After the completion of our first project on Metabase(Ticketing System Analysis), we moved on to Grafana. The overall learning curve was not very steep allowing us to grasp problem solving skills and data analysis basics in a short span of time and implement them to create interactive and live status dashboards.

Objectives of the project: To analyse databases and create visually simple and understandable dashboards in order to convey complex data in a simple and organized manner on platforms like Metabase and Grafana. We analysed 2 databases: 1) ERP-Service Reports Database 2) Interflex Access Control Database.

Tool used: Grafana, Metabase, Pycharm, Git, Github, C

Details of Papers/patents: None

Brief description of the working environment: The working environment was very positive and not your everyday corporate office vibe. Instead very lively colleagues and a supportive environment along with helpful seniors and mentors. Expected projects in the IoT domain to grow in the field but the only viable option available in the internship time frame was data analytics project. Learnings included SQL Programming language, Metabase, Grafana, Pycharm, and some other software with increased proficiency in Excel. Also learned problem-solving, time management, how to meet deadlines, and proficient communication skills.

Academic courses relevant to the project: None

Learning Outcome: Throughout this project, I learned the importance of effective communication and collaboration. It was crucial to maintain open lines of communication with my team members and to actively listen to their ideas and feedback. By doing so, we were able to overcome challenges and achieve our goals more efficiently. Another lesson I learned was the value of planning and organization. At the beginning of the project, we spent time creating a detailed timeline and outlining specific tasks along with maintaining a record in the form of our PS-Diary. This helped us stay on track and meet our deadlines, even when unexpected obstacles arose.

PS-I station: Integrated Active Monitoring Pvt Ltd, Pune

Student

Name: EDSON GEORGE REBELLO(2021B2A81247G)

Student Write-up:

PS-I Project Title: Data Analysis

Short Summary of work done: Made live status version of various dashboards of the company in metabase and Grafana. Which helped save a lot of time for the company. And solved various issues that the

Objectives of the project: Make relevant Analysis for Companies Performance and benefit

Tool used: Grafana, metabase, pycharm, apache superset, Excel, Google docs, Google sheets

Details of Papers/patents:-

Brief description of the working environment: It was a largely marathi speaking workforce and i sadly didn't know but the employees were highly inclusive and spoke to me in Hindi if I had any doubt.

We had our own space which was nice to get a lot of work done.

Academic courses relevant to the project: Computer Programming

Learning Outcome: Learnt Advanced Sql, Time management, grafana

PS-I station: Jio Platforms II , Hyderabad

Student

Name: ALHAAD MODAK .(2021A3PS2112H)

Student Write-up:

PS-I Project Title: Implementing facial filters

Short Summary of work done: My project had 4 major parts which were related to implementing facial features. The parts were facial feature segmentation, hair transfer, beard transfer and lips transfer for women. I implemented these tasks using the Python3 language. The libraries which were used in this project were OpenCV, Mediapipe, and Dlib.

Objectives of the project: Facial features segmentation, Hairstyle Transfer, Beard and Lips transfer

Tool used: Jupyter Notebook, Python3, OpenCV, Mediapipe, Dlib

Details of Papers/patents:-

Brief description of the working environment: The work is definitely hectic at some times. The mentor conducts weekly meetings for the first few weeks during the learning stage. After the project has been assigned the weekly progress has to be reported to the mentor through a word doc. So in summary, the work is a bit hectic but it adds a lot to your skills.

Academic courses relevant to the project: None

Learning Outcome: Machine learning and Computer Vision

PS-I station: Jio Platforms II , Hyderabad

Student

Name: PARAM BUDHADEV .(2021A3PS2190H)

Student Write-up:

PS-I Project Title: Faceswap using mediapipe's 468 Landmarks

Short Summary of work done: In this project, we utilized three key techniques: face alignment, face frontalization, and face swap, to perform compelling face transformations in images. Face alignment involved the use of specific facial landmarks, such as the eyes and nose, to ensure precise positioning of both faces in the photos. This alignment step was crucial to prepare the faces for subsequent processes. Following face alignment, we implemented face frontalization, which entailed adjusting the orientation of the faces to appear straight and facing the camera directly. To achieve this, we employed a 3D face model as a reference, allowing us to transform the faces into a frontal view, similar to how they would appear in a passport photo. Finally, our face swap technique integrated sophisticated tools to seamlessly blend the aligned and frontalized faces. By skillfully merging the facial features of the two individuals, we generated new images where the

faces seemed to exchange places convincingly. The learning outcome of this project was the successful realization of realistic and visually compelling face swaps, producing the illusion that the subjects genuinely switched faces. Through the systematic application of face alignment, frontalization, and face swap, we demonstrated the potential of these techniques in achieving captivating visual transformations. This project served as an innovative and creative approach to manipulate facial images, offering possibilities for playful and entertaining content generation.

Objectives of the project: To perform face-swap using Mediapipe's 468 Landmarks

Tool used: In this project, we utilized a combination of hardware and software tools to implement the face alignment, face frontalization, and face swap techniques. The hardware setup comprised a standard computer system equipped with a modern CPU and GPU to handle

Details of Papers/patents:NA

Brief description of the working environment: This was an online PS, therefore it was very comfortable, we would have meets initially once a week, and later every Friday we would have to give a weekly update report. The mentor was supportive and helpful whenever required.

Academic courses relevant to the project: Machine Learning
Deep Learning

Learning Outcome: Computer vision, openCV, python, numpy, pandas, sklearn and image preprocessing.

PS-I station: Jio Platforms II , Hyderabad

Student

Name: SHUBHAM GUPTA .(2021A7PS0468P)

Student Write-up:

PS-I Project Title: Frontend Development

Short Summary of work done: I have initially learnt about technologies like HTML, CSS and Javascript, and then practiced by cloning some dummy websites which Sir gave us to practice on. Next we learnt about Angular file system, and how to design web pages in Angular, and then we worked on a real life project based on a referral system.

Objectives of the project: To learn and implement Frontend Development skills in a real life project.

Tool used: HTML, CSS, JavaScript, Angular, WebStorm, Github

Details of Papers/patents:NA

Brief description of the working environment: The working experience with Saurabh Sir was very holistic and motivating. Sir would continuously give positive feedback and recommendations on how to improve our work, as well as future scopes for the same. He was continuously pushing us to try and do better, which was very motivating. I initially expected to do ML or AI related work, and was a bit disappointed when I found out I had to do Frontend, but Saurabh Sir made it really fun and enjoyable.

Academic courses relevant to the project: Multimedia Computation (as a component involves frontend development)

Learning Outcome: I have learnt about technologies like Git, GitHub, HTML, CSS, JavaScript and AngularJS, as well as worked on a real life project.

PS-I station: Jio Platforms II , Hyderabad

Student

Name: SAMRADDH SAXENA .(2021A7PS1455P)

Student Write-up:

PS-I Project Title: Frontend Development

Short Summary of work done: I started by learning from courses on LinkedIn. The courses were related to HTML, CSS and JavaScript. Then I made 2 webpages. First: It was a food template. The other one was a template of a clothing store. The main task was to make the website responsive for every screen width. It took me a lot of time and

training to complete that webpage. Later I was given the task to learn Angular, that too with the help of LinkedIn course and coursera courses.

Objectives of the project: Learning frontend

Tool used: Software: Code Editor, Browser, Node.js, LinkedIn, Jio meet. Hardware: Computer

Details of Papers/patents:NA

Brief description of the working environment: The working environment was nice and cool. The company mentor focused on learning and never gave false hopes. He always wanted me to improve and do better work. The company was encouraging and wanted us to develop a right approach for frontend development.

I also found a senior from college there which helped a lot in mixing up and learning all together.

Academic courses relevant to the project: Object Oriented Programming.

Learning Outcome: HTML, CSS, Javascript

PS-I station: Jio Platforms II , Hyderabad

Student

Name: BHAARATH K.(2021A7PS1816H)

Student Write-up:

PS-I Project Title: JioStream

Short Summary of work done: First, we had a training period for about 2 weeks where we learnt various web dev technologies like React, Express etc. Then we started working on our main project which was the super admin portal for the JioStream website, The super admin portal had a login page, dashboard (for analytics) and admin controls (which the admin can edit/delete/add). We usually had a meeting everyday where we discuss the progress and assign tasks for the day. It was quite a fruitful experience as we worked on it as a team and I learnt a lot on the way.

Objectives of the project: To make Super Admin portal for JioStream

Tool used: ReactJS, Express, MongoDB

Details of Papers/patents:-

Brief description of the working environment: The working environment was very flexible here at Jio. The mentors were very helpful and friendly whenever we needed, we usually had a meeting every day at noon where we discuss progress and get tasks assigned for the day. We would later divide these tasks between our team and start working, we could work anytime(day/night) before the next review meet. There was enough time and freedom for us to explore the concepts ourselves and we were not expected to do work full time 24/7, spending around 3-4 hours was enough for the most part. During this entire PS1 I learnt entire full stack web development (Front end technologies like React and backend technologies like Express with NodeJS). Overall, this was a very constructive experience.

Academic courses relevant to the project: Object Oriented Programming

Learning Outcome: Front end and back end web technologies

PS-I station: Jio Platforms II , Hyderabad

Student

Name: NANDAN BIPINBHAI SURANI(2021A7PS1909G)

Student Write-up:

PS-I Project Title: JioStream

Short Summary of work done: The project begin with first learning about reactjs and then creating a login page for the portal. Then we moved on to creating Sidebars,Navbars and basic charts and tables to display analytics.Then we worked on improving the ui of the website and finally deployment

Objectives of the project: Make a Super Admin Portal

Tool used: HTML,CSS,ReactJS

Details of Papers/patents:None

Brief description of the working environment: The work environment was really great. Our mentor was really helpful and friendly. We learned how to create a website from scratch, how to collaborate effectively while working on a project and learned a lot about web development. In short it was a great learning experience.

Academic courses relevant to the project: Computer Programming

Learning Outcome: Learned web development

PS-I station: Jio Platforms II , Hyderabad

Student

Name: IMAAD NISARAHMED MOMIN(2021A7PS2066G)

Student Write-up:

PS-I Project Title: JioStream

Short Summary of work done: We were first given several tasks to learn and explore full stack development. After completion of training we were assigned the task of making a super admin portal using react, we were also told to design a backend for the said dashboard

Objectives of the project: Developing a super admin portal for jio services

Tool used: React.js, bootstrap, node.js, express, mongodb, mui

Details of Papers/patents:NA

Brief description of the working environment: We interacted with two managers. Both were very helpful. We were given several insights into how we can write better code/make our project better and how the company operates and provides services to its clients.

Academic courses relevant to the project: OOP & DBMS

Learning Outcome: Learnt about React, html, css, express and mongodb, apis

PS-I station: Jio Platforms II , Hyderabad

Student

Name: ADITYA PATEL .(2021A7PS2433P)

Student Write-up:

PS-I Project Title: Hair Segmentation and Face Detection

Short Summary of work done: Learnt about machine learning and learnt to use Python to implement and develop said model. Developed and trained an A.I. model using Computer Vision and DeepLab V3+ to detect faces as well as segment out hair from given images.

Objectives of the project: To develop an AI model to detect faces and create masks to segment out the hair in the input images.

Tool used: Lenovo IdeaPad Gaming Laptop, Google Colab, Kaggle

Details of Papers/patents:None

Brief description of the working environment: Working environment was alright, only interacted with one Jio employee i.e our mentor. He was helpful and understanding with his feedback. Mostly worked with other interns during the development of our model where each one of them was very helpful and we worked together well as a unit.

Academic courses relevant to the project: Mathematics 2, Probability and Statistics, Computer Programing

Learning Outcome: Learnt to develop machine learning algorithms from scratch.

Learnt to use Python.

Learnt popular libraries such as NumPy, TensorFlow, Torch, Computer vision (cv2)

Learnt to work on online notebooks such as kaggle and Google colab.

PS-I station: Jio Platforms II , Hyderabad

Student

Name: PATEL DEVARSH AMIT(2021A7PS2529G)

Student Write-up:

PS-I Project Title: Face recognition and hair segmentation

Short Summary of work done: Used OpenCV to create a face detection model and integrated it with DeepLabV3 ResNet50 architecture to make an API that segments the hair from the face. This API was used by JIO Platforms in the JIO Engage application that focuses on user engagement.

Objectives of the project: Using relevant machine learning algorithms create a model for hair segmentation to be used in jio engage

Tool used: Opencv, pytorch , deeplabv3, resnet50

Details of Papers/patents:None

Brief description of the working environment: Great support from mentor even though it was online ps. Learnt a lot of new tech related to ML and was able to successfully implement the model required. My expectations were to gain exposure to latest tech being used by jio as it expands in multiple fields .

Academic courses relevant to the project: Machine learning, deep learning

Learning Outcome: Opencv library, deeplabv3 , resnet50 architecture and a successful implementation of model for jio engage

PS-I station: Jio Platforms II , Hyderabad

Student

Name: Siddhant Kulkarni(2021A7PS2606G)

Student Write-up:

PS-I Project Title: Hair Segmentation and Face Detection

Short Summary of work done: We had to create a semantic segmentation mask of hair and display it on the original image. In order to do this we used OpenCV to detect face and passed the bounding box of the face into a semantic segmentation model to detect hair. We had to train the semantic segmentation model on our own while OpenCV was good enough for the face detection task.

Objectives of the project: Create a segmentation mask of hair and display it on the original image.

Tool used: PyTorch, Keras, Tensorflow, NumPy

Details of Papers/patents:NA

Brief description of the working environment: The mentor gave us a lot of freedom, he initially gave us choice between an NLP task and a computer vision task. I was in a group of 3 people assigned to the mentor, all of us decided to go with computer vision. He gave us resources to get started and gave us the task.

There were no deadlines or anything, once we completed the task assigned to us we just informed the mentor and he would give us feedback and tell us what to do further. I learnt quite a bit about deep learning and I found it very interesting.

Academic courses relevant to the project: Probability and Statistics, Linear Algebra

Learning Outcome: Deep Learning, Computer Vision, Convolutional Neural Networks

PS-I station: Jio Platforms II , Hyderabad

Student

Name: MANRAJ SINGH CHAHAL(2021A7PS2630G)

Student Write-up:

PS-I Project Title: Jio Coupons: Web Development

Short Summary of work done: During the course of my internship, I built 2 projects. The first project was a text-to-HTML Converter. It could be used to convert any user input into a HTML file. My second project was the Remote Code Execution Application. It helps user run JavaScript code online. I mostly used React to make the frontend of both the applications.

Objectives of the project: Building a Remote Code Execution Application like LeetCode

Tool used: React.js, Node.js, HTML, CSS, JavaScript

Details of Papers/patents:N.A.

Brief description of the working environment: My PS-1 was completely online. The only interaction I had with my company was through regular online meets with my mentor. He was very helpful and took great interest in our project. I got hands-on experience building webpages for Jio.

Academic courses relevant to the project: Object Oriented Programming

Learning Outcome: Designing the User Interface of a website using React.js and different frameworks of CSS like Bootstrap, Tailwind CSS, etc.

PS-I station: Jio Platforms II , Hyderabad

Student

Name: KENZ ABDULLA(2021A7PS2664G)

Student Write-up:

PS-I Project Title: Web Development

Short Summary of work done: Learning html,css,js was the initial phase. Henceforth we had to implement a remote code execution engine. It was a learning project.Our code would not be deployed.

Objectives of the project: Implementing remote code execution engine.

Tool used: ReactJs, NodeJs

Details of Papers/patents:None

Brief description of the working environment: We had weekly meets. Initially we had to learn the web dev framework. Later we got to implement small tasks. Our mentor was open to discussion about non web dev related things as well. We were also able to explore multiple Coursera courses which were free with Jio credentials.

Academic courses relevant to the project: None

Learning Outcome: Html, css, reactjs, nodejs.

PS-I station: Jio Platforms II , Hyderabad

Student

Name: PRAKHAR MUNDRA .(2021A7PS2694P)

Student Write-up:

PS-I Project Title: Automation techniques using Java Selenium and Cucumber

Short Summary of work done: Performed automation testing of Automator.AI, which is a CRM software. Verified proper login, signup. Checked for proper navigation through different screens in the Automator.AI. Verified the accuracy and corrected bugs related to software.

Objectives of the project: Automation testing of Automator.AI

Tool used: Eclipse IDE, Maven

Details of Papers/patents:Nil

Brief description of the working environment: Jio had a strong emphasis on quality assurance and sought to optimize its customer relationship management system through efficient and reliable automation testing.

From the very beginning, the company had clear expectations of me as an intern. I was entrusted with the responsibility of developing and executing automated test cases to ensure the functionality, performance, and security of the CRM software. I was expected to work closely with the development team, collaborating on identifying test scenarios, writing test scripts, and analyzing test results.

Throughout my internship, I experienced a steep learning curve. I was introduced to various automation testing frameworks, such as Selenium and Appium, which allowed me to write efficient and scalable test scripts. I learned how to set up test environments, configure test data, and utilize version control systems to manage my code effectively.

Academic courses relevant to the project: Object Oriented Programming, Logic in Computer Science

Learning Outcome: Learnt about Object Oriented Programming using Java

Learnt about performing browser automation using Selenium framework

Learnt about Behaviour Driver Development using Cucumber framework

PS-I station: Jio Platforms II , Hyderabad

Student

Name: OMKAR SHASHANK SATHE(2021B1A72280G)

Student Write-up:

PS-I Project Title: Automator.AI

Short Summary of work done: Performed automation testing of Automator.AI, which is a CRM software. Verified proper login, signup. Checked for proper navigation through different screens in the Automator.AI. Verified the accuracy and corrected bugs related to software.

Objectives of the project: Automation testing of Automator.AI

Tool used: Eclipse IDE, Maven

Details of Papers/patents:Nil

Brief description of the working environment: Jio had a strong emphasis on quality assurance and sought to optimize its customer relationship management system through efficient and reliable automation testing.

From the very beginning, the company had clear expectations of me as an intern. I was entrusted with the responsibility of developing and executing automated test cases to ensure the functionality, performance, and security of the CRM software. I was expected to work closely with the development team, collaborating on identifying test scenarios, writing test scripts, and analyzing test results.

Throughout my internship, I experienced a steep learning curve. I was introduced to various automation testing frameworks, such as Selenium and Appium, which allowed me to write efficient and scalable test scripts. I learned how to set up test environments, configure test data, and utilize version control systems to manage my code effectively.

Academic courses relevant to the project: Object Oriented Programming, Logic in Computer Science

Learning Outcome: Learnt about Object Oriented Programming using Java
Learnt about performing browser automation using Selenium framework
Learnt about Behaviour Driver Development using Cucumber framework

PS-I station: Jio Platforms II , Hyderabad

Student

Name: DEEPANSHU GARG .(2021B3A72758H)

Student Write-up:

PS-I Project Title: Quality Assurance and Bug Reporting (JioEngage Features)

Short Summary of work done: During our internship, we completed different tasks that helped us improve our skills and knowledge. First, we made reports about how users interact with the PLAY&WIN section of the MYJIO app and the BOURNVITA TJK engagement. These reports gave us a better understanding of the user's experience. We also created queries for the TAP2WIN feature and test cases for the BOURNVITA TJK engagement to ensure thorough testing. We didn't stop there - we also came up with

queries, test cases, and test scenarios for the FUNZONE section of PLAY&WIN, so we could test it properly. We kept track of any bugs we found during testing and even made up some imaginary bugs to learn more about priority and severity. Additionally, we made queries and test cases for the Scratch Card widget, which helped in its development and testing. As part of the DevOps platform, we added features, user stories, test cases, and bugs for both FUNZONE and the Scratch Card widget. This collaboration between developers and testers was made possible by the DevOps platform. Through these tasks, we gained hands-on experience in analyzing user flow, creating queries, developing test cases, and effectively using the DevOps platform.

Objectives of the project: The project focuses on quality assurance and bug reporting in the domain of JioEngage. Its objective is to thoroughly test different features of JioEngage and promptly report any identified bugs. The project's overarching goal is to ensure the smooth functionality of all features during the production phase. As testers, our primary responsibility is to prevent users from encountering significant bug-related issues. Ultimately, the project aims to prepare the features currently in the testing phase for successful deployment, making them ready to be utilized by users without any major concerns.

Tool used: Excel, Azure DevOps, Figma

Details of Papers/patents:No

Brief description of the working environment: The working environment was pleasant and motivating, with supportive mentors who were both knowledgeable and helpful in teaching us. We gained a wealth of knowledge and had a great overall learning experience. However, it would be beneficial for the company to expand projects in emerging fields to provide more learning opportunities. Throughout the past 35-40 days, our internship has been incredibly valuable, allowing us to gain a comprehensive understanding of software development processes, testing methods, and effective documentation techniques.

Academic courses relevant to the project: None

Learning Outcome: During our training at Jio Platforms, we learned a lot about software testing and quality analysis. We discovered different teams involved in product development, understood the Software Development Life Cycle (SDLC), and mastered preparing user flow reports. We also learned how to write effective queries and test cases, identify bugs, and assign severity and priority correctly. Creating scenarios for engagements and understanding Azure DevOps were other valuable skills we acquired. Additionally, we gained insights into engagements, tools, and maintenance. Overall, our training covered the entire testing cycle, equipping us with essential skills for software testing and quality analysis.

PS-I station: Jio Platforms II , Hyderabad

Student

Name: VAIBHAV GUPTA .(2021B3A72786P)

Student Write-up:

PS-I Project Title: Quality Assurance and Bug Reporting (JioEngage Features)

Short Summary of work done: During our internship, we accomplished various tasks that enhanced our skills and knowledge. Firstly, we created user flow reports for the PLAY&WIN section of the MYJIO app and the BOURNVITA TJK engagement, providing detailed insights into the user journey. We also formulated queries for the TAP2WIN feature and test cases for the BOURNVITA TJK engagement, ensuring comprehensive testing coverage. Additionally, we generated queries, test cases, and test scenarios for the FUNZONE section of PLAY&WIN, enabling thorough testing of its functionalities. We documented a list of bugs encountered during testing and even created a hypothetical bug list to understand the distinction between priority and severity. Furthermore, we formulated queries and test cases for the Scratch Card widget, contributing to its development and testing process. As part of the DevOps platform, we added features, user stories, test cases, and bugs for both the FUNZONE section and the Scratch Card widget, promoting collaboration between developers and testers. Through these tasks, we gained practical experience in user flow analysis, query formulation, test case development, and effective use of the DevOps platform.

Objectives of the project: To check the features that are released in JIO ENGAGE for any bugs and report any bugs found.

Tool used: MS EXCEL, MS WORD, FIGMA, AZURE DEVOPS

Details of Papers/patents:NONE

Brief description of the working environment: Over the course of the past 35-40 days, our PS has been a rich learning experience. We started by immersing ourselves in the Jio Engage platform and understanding its functionalities. We then delved into the world of software development, discovering the crucial roles played by teams like CSM, product management, and QA in ensuring the smooth and timely delivery of bug-free products and features. Learning about the Software Development Life Cycle (SDLC) provided us with a structured approach, covering planning, product definition, design, development, testing, and deployment. A particular focus was placed on the responsibilities of the QA team, involving understanding the product, creating meticulous test cases, and striving for minimal bugs. We comprehended the testing life cycle and honed our skills in

documenting user flow reports, generating queries, and formally documenting test cases and bugs. Moreover, we explored business concepts underlying engagements on the MYJIO app and gained insights into admin settings, bug life cycles, severity vs. priority in bug reporting, and the creation and documentation of different testing scenarios. Finally, we were introduced to the DEVOPS platform, where we learned how to collaboratively work on features by adding user stories, test cases, and bugs. Overall, our internship has provided us with a well-rounded understanding of software development processes, testing methodologies, and effective documentation techniques.

Academic courses relevant to the project: NONE

Learning Outcome: Throughout our internship and the completion of various tasks, we have gained significant learning outcomes:

1. User Flow Analysis: We have acquired the ability to analyze and document user flows, understanding the sequence of steps and interactions involved in different app sections and engagements.
2. Query Formulation: We have developed skills in formulating clear and concise queries based on design specifications, ensuring a thorough understanding of requirements and facilitating effective communication with the development team.
3. Test Case Development: We have honed our skills in creating comprehensive test cases, defining specific steps, and expected outcomes for thorough testing coverage.
4. Bug Identification and Documentation: We have learned how to identify, document, and report bugs encountered during testing, ensuring that they are appropriately logged for resolution.
5. Understanding Severity and Priority: Through the creation of a hypothetical bug list, we have gained a clear understanding of the distinction between severity and priority in bug reporting, allowing us to prioritize issues effectively.
6. Collaboration on DevOps Platform: By working with the DevOps platform, we have learned how to add features, user stories, test cases, and bugs, facilitating seamless collaboration between developers and testers and enhancing overall project management.
7. Practical Application of SDLC: Our tasks have provided us with hands-on experience in applying the Software Development Life Cycle (SDLC), particularly in the areas of planning, design, development, testing, and deployment.
8. Comprehensive Testing Approach: Through the creation of test scenarios, we have learned how to develop diverse testing scenarios, considering different user interactions and potential scenarios to ensure thorough testing coverage.
9. Documentation Skills: We have strengthened our ability to formally document various aspects, including user flow reports, queries, test cases, and bug reports, ensuring clear and organized project documentation.

These learning outcomes have equipped us with valuable skills and knowledge in software development, testing methodologies, bug tracking, and effective communication within a development team.

PS-I station: Jio Platforms II , Hyderabad

Student

Name: CHINMAY PUSHKAR .(2021B4A70887P)

Student Write-up:

PS-I Project Title: Quality Assurance (JioEngage Features)

Short Summary of work done: Worked on Testing of upcoming JioEngage features.

Objectives of the project: Preparing test cases and reporting bugs

Tool used: Excel, Azure Devops, Figma

Details of Papers/patents:None

Brief description of the working environment: Nice

Academic courses relevant to the project: None

Learning Outcome: Excel proficiency, Azure Devops Proficiency, Industry understanding, QA teams work

PS-I station: Jio Platforms II , Hyderabad

Student

Name: ARHAM JAIN(2021B4A71882G)

Student Write-up:

PS-I Project Title: Quality Assurance JIO Events

Short Summary of work done: Our primary focus was on a specific test case involving the seamless transition of screen sharing between two individuals. We wanted to ensure that the person who initiated the screen sharing could observe the subsequent sharing by another participant after their screen sharing ended and started for the other participant. We checked all the features of events like camera, mic, sharing screen feature, pause event, and Prezi features. We did this thing for both large-scale and short-scale events. We checked the reactions part, sharing the screen and playing some videos on youtube. meetings involved checking the new dashboard's tabs: Home, Explore, and My Events. We also reviewed My Profile and the profile editing section.

Objectives of the project: To test all the features of Jio Events

Tool used: Jio Events, microsoft excel , microsoft teams, figma

Details of Papers/patents:Not publised any papers

Brief description of the working environment: The working environment is excellent, and all the Jio officials are very helpful, supportive, and eager to teach us work-related things.

Academic courses relevant to the project: Technical Report Writing and the research papers related to software testing

Learning Outcome: Gain hands-on exposure to QA processes, enhance technical skills, and develop a deep understanding of teamwork dynamics through daily tasks.

PS-I station: Jio Platforms II , Hyderabad

Student

Name: MAYUR AGARWAL .(2021B4A72759P)

Student Write-up:

PS-I Project Title: Jio Charge It(Jio events Quality Assurance)

Short Summary of work done: My PS-1 role as a Jio QA Team member was to carry out manual testing alongside the QA team on various test settings to confirm the functionality & quality of the software programme JioEvents. Early in the development

phase, I was able to spot potential faults and usability problems by comparing the designs made in Figma to the actual application. I ran numerous complete test scenarios and recorded my test findings, including any flaws or difficulties. I was able to successfully communicate my findings so that the problems could be fixed by keeping track of my test results. I took part in a number of team meetings in addition to my main testing tasks. I developed a thorough understanding of the software development life cycle and the significance of quality assurance throughout my PS-1 experiences, which helped me to produce reliable and user-friendly apps. Not just from functional requirements, but also from usability and user experience, I learnt how to test with the user in mind.

Objectives of the project: Gain hands-on experience of QA processes, enhance technical skills, and develop a deep understanding of teamwork dynamics through daily tasks.

Tool used: Excel and Figma

Details of Papers/patents:None

Brief description of the working environment: The atmosphere at Jio when I interned there was excellent, and everyone got along well. We emphasised teamwork and never-ending improvement. High standards were set by my mentor for us in terms of producing excellent work, meeting deadlines, and contributing to group discussions. I had the chance to learn about industry-recognized quality assurance procedures throughout my internship. I also improved my communication and problem-solving skills, and I received real-world experience with testing methodologies and tools.

Academic courses relevant to the project: TRW and CP

Learning Outcome: Gaining technical knowledge, comprehending quality assurance procedures, boosting cooperation and collaboration abilities, enhancing problem-solving abilities, enhancing communication abilities, and adjusting to changing settings.

PS-I station: Jio Platforms Ltd - III , Hyderabad

Student

Name: RISHI SINHA .(2021A3PS2930H)

Student Write-up:

PS-I Project Title: Quality Assurance- JioEvents

Short Summary of work done: During my PS-1 at Jio Platforms, I worked as part of the Quality Assurance team. My main responsibility was to perform manual testing with the QA team on different testing environments to ensure the quality and functionality of the software application, JioEvents. By closely examining the designs made on Figma and comparing them with the actual application, I was able to identify any discrepancies or inconsistencies. This helped in detecting potential bugs or usability issues early in the development process. I extensively used Excel sheets to document and track my testing activities. I tested various comprehensive test cases and logged the test results, including any defects or issues discovered. By maintaining organized records, I effectively communicated my findings to the development team so that they could work on resolving the identified issues. Apart from my primary testing responsibilities, I actively participated in team meetings and Dry run tests. Throughout PS-1, I gained a deep understanding of the software development life cycle(SDLC) and the importance of quality assurance in delivering reliable and user-friendly applications. I learned how to approach testing from a user's perspective, focusing on not only functional requirements but also usability and user experience aspects. This experience allowed me to enhance my testing skills, collaborate effectively with the team, and gain valuable insights into the quality assurance processes within a professional setting.

Objectives of the project: Gain hands-on exposure to QA processes, enhance technical skills, and develop a deep understanding of teamwork dynamics through daily tasks.

Tool used: (Excel) - for issue tracking, (Figma) - for UI and functionality evaluation and (Microsoft Teams) - for communication with my mentor and team members.

Details of Papers/patents:NA

Brief description of the working environment: It was a professional and cooperative work atmosphere with a focus on teamwork and ongoing development while I was a PS-I at Jio. The mentor established high expectations for us to create excellent work, meet deadlines, and actively participate in team discussions. I had the chance to learn about industry-recognized quality assurance procedures throughout my PS-1, get practical experience with testing techniques and tools, and hone my communication and problem-solving abilities.

Academic courses relevant to the project: Technical Report Writing, CP

Learning Outcome: Obtaining technical knowledge, understanding quality control procedures, improving teamwork and collaboration skills, improving problem-solving skills, improving communication skills, and adapting to changing environments.

PS-I station: Jio Platforms Ltd - III , Hyderabad

Student

Name: Vamsi Krishna Gattupalli(2021A7PS0040H)

Student Write-up:

PS-I Project Title: DEVELOPMENT OF A ONE-ON-ONE VIDEO CONFERENCING WEBSITE

Short Summary of work done: Developed a basic meeting application having Video, Audio and Screen Share streams. Used Angular, TypeScript and PeerJS.

Objectives of the project: To understand the details of how a meeting web application can be developed so that it would be helpful when working on the JioEvents product website

Tool used: TypeScript, Angular, PeerJS

Details of Papers/patents:N/A

Brief description of the working environment: Jio Platforms does not expect any prerequisites from students. Instead, they are given enough time to learn the required technologies which are informed by the company. All along the learning period of technologies, we were given regular tasks in order to check our understanding.

Academic courses relevant to the project: OOP

Learning Outcome: Familiarity with the tech stack used at multinational firms like Jio Platforms and working on projects that might actually get into production

PS-I station: Jio Platforms Ltd - III , Hyderabad

Student

Name: SURYANSH CHANDOLA .(2021A7PS0058H)

Student Write-up:

PS-I Project Title: JioEvents

Short Summary of work done: Learnt front end web development including HTML, CSS and Javascript. Then progressed on to learning the Angular framework. Made a calculator app, a user registration form and preview screen of a video conferencing app

Objectives of the project: Make user interfaces for the JioEvents website

Tool used: VS code, Node Js

Details of Papers/patents:None

Brief description of the working environment: Relaxed working environment without unnecessary pressure.

Academic courses relevant to the project: Object Oriented Programming

Learning Outcome: Learnt web development(front end) and worked with the Angular framework.

PS-I station: Jio Platforms Ltd - III , Hyderabad

Student

Name: VANI JAIN .(2021A7PS2062H)

Student Write-up:

PS-I Project Title: Web development and ML model to classify toxic online comments

Short Summary of work done: For the first half of the internship, I was asked to learn about HTML,CSS, TypeScript and Angular. I was assigned the task to build frontend for Jio Cinema's landing page, which I built using HTML, CSS, JavaScript and Bootstrap. After this I was given a choice to work on an angular project to implement screen share

and camera streams, or work on building a machine learning model to identify and classify toxic comments. I chose the second option and using a dataset from Kaggle, I built a LSTM model for the same.

Objectives of the project: For the first half of the internship the objective was to make a frontend for Jio Cinema's landing page. For the next half the task was build a machine learning model to identify and classify online toxic comments.

Tool used: NA

Details of Papers/patents:NA

Brief description of the working environment: All in all it was fairly okay, I got experienced working under a professional and got to widen my knowledge. My PS faculty was great and helped me improve my soft skills through group discussions and presentations. My company mentor was helpful whenever needed but wasn't much involved. The web development task was pretty easy but the next task helped me read and learn about a new concept and expand my knowledge.

Academic courses relevant to the project: Machine Learning, NLP

Learning Outcome: Learned more about HTML, CSS, JavaScript, Recurrent neural networks, Long short term memory

PS-I station: Jio Platforms Ltd - III , Hyderabad

Student

Name: Patel Teerth Vasant(2021A7PS2090H)

Student Write-up:

PS-I Project Title: Front-end Web Development

Short Summary of work done: We were assigned a mentor from the industry who provided us with a comprehensive overview of the project details. Subsequently, we were allocated time to acquire the fundamentals of web development and put our theoretical knowledge into practice. Additionally, we delved into the intricacies of the Angular framework and commenced our project work. Throughout the duration of the project, we

maintained regular communication with both our company mentor and our Practice School (PS) faculty. The company mentor played a pivotal role in assisting us, addressing our queries, and guiding us on optimizing our work for optimal results.

Objectives of the project: creating movie streaming website similar to Jio Cinema using Angular

Tool used: Used Angular framework

Details of Papers/patents:no papers/patents

Brief description of the working environment: It was a good experience as I got to learn about how a corporate company works and many other technical related stuff. Both industry and faculty mentors were really good and ready to help in case of any doubt.PS-1 helped in improving my technical skills, presentation skills, communication skills and enhanced my knowledge about Web Development. Meeting new people from other campuses was a very nice feeling as well.

Academic courses relevant to the project: no courses relevant

Learning Outcome: The project gave me an opportunity to learn different tools which helps in making web development projects. I learned about tools like HTML, CSS, Bootstrap, JavaScript, and Angular framework and using all the tools together helped me to complete my project successfully.

PS-I station: Jio Platforms Ltd - III , Hyderabad

Student

Name: MAITREYA MANOHAR .(2021A7PS2663H)

Student Write-up:

PS-I Project Title: Jio Cinema Frontend Web Development

Short Summary of work done: I worked on HTML, CSS, Javascript, and Angular, an industry-level front-end framework. For the first two weeks, I learned these tools from

various resources. In the following two weeks, I learned how to build a calculator with plain HTML, CSS, and Javascript. Then, I started by creating a clone of Jio Cinema using Angular and Bootstrap as a CSS Framework. I got the data for the project from a free API source called "The Movie Database." Most of the work was building an interactive web application using angular and giving the user a smooth experience. I was finally assigned a task to remove the green background of a video and display it on a canvas in real-time. This project took more time than expected because there were few resources online to learn from; I had to implement it on my own after some basic understanding. Overall, it was a great experience learning through Jio Platforms.

Objectives of the project: Recreate the Jio Cinema website using angular

Tool used: VSCode, Angular, HTML, CSS, Bootstrap, Javascript, Typescript

Details of Papers/patents:N/A

Brief description of the working environment: The working environment in Jio was great. My mentor was friendly and knowledgeable and helped me with every doubt or query. We met with our mentor twice a week to review our work frequently. He gave us tips and industry-level practices, which made us work more efficiently. I learned many soft skills, such as communication and team building, during the PS-1 course. The company fulfilled my expectations to the maximum. I did expect a machine learning project but was also keen on learning front-end web development. Overall, my experience working in Jio has been incredible.

Academic courses relevant to the project: Computer Programming, Data Structures and Algorithms and Object-Oriented Programming were among the two courses that were very helpful in my project.

Learning Outcome: Proficiency in HTML markup and CSS styling, JavaScript programming for interactivity, responsive design, browser compatibility, web performance optimisation, version control with Git, knowledge of frontend frameworks like Angular, debugging and troubleshooting abilities are among the key learning outcomes in my PS-1 course.

PS-I station: Jio Platforms Ltd - III , Hyderabad

Student

Name: AADIT NAYYAR .(2021A7PS2687P)

Student Write-up:

PS-I Project Title: Jlo Events - Front End Development

Short Summary of work done: We worked on front-end development using Angular. The goal was to replicate the Jio Events website. However, due to time constraints, we could focus only on learning the tech stack through a series of tasks.

Objectives of the project: To create a

Tool used: Angular, HTML, CSS, JavaScript

Details of Papers/patents:NA

Brief description of the working environment: The working environment of the company is very relaxed, maybe even too relaxed. Students will often have to nudge their industry mentors to have a meet and review their work. The mentors are very understanding, and give ample time to complete the tasks.

Academic courses relevant to the project: none

Learning Outcome: Front-End Development using Angular

PS-I station: Jio Platforms Ltd - III , Hyderabad

Student

Name: SUBHRADIP MAITY(2021A7PS2983G)

Student Write-up:

PS-I Project Title: Jiomeet

Short Summary of work done: Made literature reviews, did a case study on a metaverse platform and scraping data using Python

Objectives of the project: Provide case study on metaverse platform

Tool used: Python

Details of Papers/patents:NA

Brief description of the working environment: Good

Academic courses relevant to the project: NA

Learning Outcome: Learnt python and webscraping

PS-I station: Jio Platforms Ltd - III , Hyderabad

Student

Name: VANSH AGRAWAL .(2021A7PS2998H)

Student Write-up:

PS-I Project Title: Study and analysis of different metaverse projects

Short Summary of work done: In the first half I studied about metaverse concepts and terminologies. In the later part I made a web Scraping tool using python to scrape different websites for reviews on different metaverse projects like pokemon Go, VRChat, Roblox,etc, and after which it is used to analyse by using sentiment analysis and topic modeling.Lastly we interpret the gained results to get useful insights for investors and developers for improving metaverse technologies

Objectives of the project: To Study and understand about metaverse concepts and then collect(web scrape) reviews on them to analyse

Tool used: Python(&differnet libraries like beautifulSoup,numpy, etc)

Details of Papers/patents:N/A

Brief description of the working environment: The working environment of company is nice.The mentors were helping and understood the points where we might get stuck while coding,and told alternate ways to do it.

Academic courses relevant to the project: Machine learning

Learning Outcome: Metaverse Concepts, Web Scraping and Topic Modeling

PS-I station: Jio Platforms Ltd - III , Hyderabad

Student

Name: JAIRAM KAUSHIK YALLA .(2021A8PS0789H)

Student Write-up:

PS-I Project Title: FORTNITE AS A METAVERSE - A CASE STUDY

Short Summary of work done: As part of my PS1, there were regular meetings with the company mentor, the first of which was regarding the allocation of projects to different groups of students. The subsequent meetings, which occurred once the allocation of projects was done, were regarding the progress made in the project over the course of PS1. The project topic allocated to me was “Metaverse” and the project description indicated that I had to prepare a Case Study on any Metaverse platform, for which I chose “Fortnite”. For the project I had to collect information about the platform from various research articles and internet sources (which then had to be paraphrased to avoid plagiarism) along with the pre-requisite knowledge I had about the platform. The information collected mostly covered the overview, features (that help us classify it as a Metaverse platform), Year-on-Year (YoY) statistics (revenue generated, age demographics, etc.), platform-specific jargons, pros and cons, side effects along with some of the suggested remedies to mitigate them, and its future potential in an ideal scenario. Relevant images were also collected from the internet to better explain the textual information. Both the textual information and the images had to be cited too in order to avoid plagiarism. Finally, a Project Report was created based on the information collected and submitted in the PSMS and LMS platforms for which we were evaluated. Along with all this, there were quizzes, group discussions, seminars (PPT presentations) as part of the evaluation structure which were conducted by the PS Faculty.

Objectives of the project: Preparing a Case Study on the Metaverse Platform known as "Fortnite"

Tool used: Web Scraping

Details of Papers/patents:None

Brief description of the working environment: The working environment of the company was very good and motivating. Everyone there was always willing to guide and help out regarding the project at any moment of time. The timings of the meetings were also flexible and were often adjusted based on our availability. But the only issue was that unlike the previous year trend, the company allotted the projects to students without consulting them about their domain of interest which I think should not have been the case. Apart from this concern, the company managed to meet my expectations in all the other aspects. Speaking of the learning outcomes of the internship, I gained vital information about my project domain, about which I did not have any idea till the internship began. The Metaverse being an upcoming domain which has a lot of future potential, having sound knowledge about it would certainly help me in my career ahead if I wish to pursue anything related to it in the future.

Academic courses relevant to the project: Artificial Intelligence

Learning Outcome: Understood what a Metaverse platform is, what its advantages and side effects are (and how to overcome them), what challenges (ethical and technological) it faces in the modern world, and what its future potential is if the challenges are overcome.

PS-I station: Jio Platforms Ltd - III , Hyderabad

Student

Name: DIVYAM GUPTA .(2021AAPS2870H)

Student Write-up:

PS-I Project Title: Explainable Detection of Online Sexism

Short Summary of work done: my project “Explainable Detection of Online Sexism (EDOS)” proposes and applies a novel hierarchical taxonomy that includes vectors and categories of sexism to aid explainability. The model can be divided into three tasks: A, B, and C. Task A is binary classification whereas B and C are multiclass classification. Task A simply defines whether the content is sexist or not. If it is sexist then which type of sexism category and vector this content belongs to is defined by Task B & C. I got a

chance to learn various topics for my project. The topics were mostly of domain Machine Learning and Natural Language Processing.

Objectives of the project: To detect sexist content and

Tool used: BERT, spacy, nltk, sci-kit libraries

Details of Papers/patents:None

Brief description of the working environment: The working environment was good enough. We were having meetings with our mentor on a weekly basis. The mentor did clear our doubts but didn't provide or even tell us good resources to study topics that he gave. Also, the GitHub repository he gave us to study was a little bit complex for beginners and in my group we all were beginners. From evaluations like report writing, group discussion, and seminar I was able to improve my interaction and presentation skills.

Academic courses relevant to the project: None

Learning Outcome: I gained experience in ML and NLP domains. I also improved my communication and presentation skills.

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: GAUTAM GARG(2021A3PS2444P)

Student Write-up:

PS-I Project Title: Disaster Management using ML model

Short Summary of work done: First we read up about how the dataset was created. Then we learned basics of machine learning and how to use Google Colab. Then we saw some repositories online similar to the work we were doing. Then we implemented a VGG16 and LSTM model.

Objectives of the project: Training a ML model using images from Twitter to help in disaster management

Tool used: PyTorch, Google Colab

Details of Papers/patents:-

Brief description of the working environment: The working environment was great and the mentor helped us a lot, we were given tasks which we had to complete and the mentor kept tabs on us and we had weekly meets discussing about the work to be done next.

Academic courses relevant to the project: Computer Programming, Machine Learning

Learning Outcome: Learned how to create a Machine Learning model using PyTorch

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: ARVIN DATTA .(2021A7PS0430P)

Student Write-up:

PS-I Project Title: Multimedia Automatic Misogyny Identification

Short Summary of work done: The project was divided into two subtasks, to detect a misogynistic meme and classify it based on the information extracted from the image and text contained. We experimented with different CNN models for text transcription from images and used NLP and sentiment analysis for classification. Depending on accuracy and execution time, layers of pre trained models were frozen to observe varied results. Final task involved selection of appropriate model for both tasks and present a working model for running the test set data.

Objectives of the project: To create a working model for identification of misogynistic memes

Tool used: Python, Google Colab

Details of Papers/patents:<https://aclanthology.org/2022.semeval-1.74>

Brief description of the working environment: The organisation helped in multiple ways, suggesting resources to learn and guide through various approaches of building the model. Weekly meetings ensured proper communication and regular updates of our progress and difficulties faced. The working environment was stress free and deadlines were reasonable with particular emphasis on our learning outcomes.

Academic courses relevant to the project: DSA, AI, ML, NLP

Learning Outcome: Learnt about AI/ML, NLP and Neural networks
Gained insights about ideation and implementation of project

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: AADEESH GARG .(2021A7PS0446P)

Student Write-up:

PS-I Project Title: Multimedia Automatic Misogyny identification

Short Summary of work done: We recieved our project and then started working on the baseline models of the ML Model. We learnt ML and Python through various courses. Then we started working on increasing the efficiency of the baseline model which went up to 76%. We used multiple transfer learning based models like Roberta , Bert , Albert , Electra , Use for text analysis and VGG 16, RESnet , Vit Bert, Inception Net for image analysis.

Objectives of the project: To Train a ML model for identification of misogynistic memes across various social platforms

Tool used: Google Collab and Python on laptops at hand

Details of Papers/patents:NA

Brief description of the working environment: We have been working on the project remotely from our homes. We have our meets with the mentor once a week. All the resources and project details are either sent by email or on WhatsApp groups.

My expectations from the company were bare minimum, I just wanted a project that aligned with major topics in research today and wanted to work on a project which really makes an impact on the society .

Skill development during the PS was exceptional. I have learnt a lot about training a model and now have better proficiency in using libraries like numpy and panda.

Academic courses relevant to the project: Courses on Coursera by Andrew ng on deep learning and machine learning

Learning Outcome: Learnt training a model and libraries like numpy panda tensorflow transformers

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: MANAN GUPTA .(2021A7PS2091H)

Student Write-up:

PS-I Project Title: EXPLAINABLE DETECTION OF ONLINE SEXISM

Short Summary of work done: The model can be divided into three tasks: A, B, and C. Task A is binary classification, whereas B and C are multiclass classifications. Task A simply defines whether the content is sexist or not. If it is sexist, then which type of sexism category and vector this content belongs to is defined by Task B & C.

Objectives of the project: To promote a safer and healthy internet for women.

Tool used: Github, TensorFlow, Kaggle

Details of Papers/patents: None

Brief description of the working environment: As it was an online internship, there was no working environment as such therefore working in a team of 3-4 and doing the tasks allocated on time was pretty challenging.

Academic courses relevant to the project: None

Learning Outcome: Learnt a lot about various Machine Learning techniques as well as Natural Language Processing

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: AGRAWAL VANSI ANIL .(2021A7PS2215P)

Student Write-up:

PS-I Project Title: ML model for determining severity of an calamity

Short Summary of work done: The project aims to develop a multimodal machine learning (ML) model using a provided Twitter dataset. The dataset includes text and visual information, and the goal is to create a comprehensive solution for analysis and prediction. The project begins with examining the dataset, understanding its structure, and performing any necessary preprocessing. Next, a multimodal fusion technique is implemented to integrate the textual and visual features. Techniques like late fusion, early fusion, or attention mechanisms are used to effectively combine the modalities. Feature extraction methods, such as word embeddings for text and CNNs or pre-trained models like ResNet for images, are applied. The ML model is then trained on the dataset. It involves splitting the data, selecting appropriate ML algorithms like RNNs, CNNs, or transformers, and fine-tuning the model parameters. The model is evaluated using metrics such as accuracy, precision, recall, and F1-score. Cross-validation techniques ensure generalizability, and comparisons with existing models provide insights into performance. In conclusion, the project develops a multimodal ML model using the provided Twitter dataset. It includes dataset examination, multimodal fusion, model training, and evaluation. The aim is to build a robust solution for analyzing and predicting outcomes using Twitter data.

Objectives of the project: To use twitter posts to get the details about severity of damage in different regions.

Tool used: S/w

Details of Papers/patents:NA

Brief description of the working environment: In my PS, it was working from home OR in online mode. We generally used to have 2 meetings with the BITS mentor and once with the mentor provided by JIO. The expectation from the was to have a decent project which we had, I expected to have a good mentorship from the company. I got enough mentorship from the station. I learned ML/AI because of this. I worked with a team of 4 members, so I learned about how to work with a team in a project. This were my few learnings.

Academic courses relevant to the project: NA

Learning Outcome: ML, AI, CNN, NLP

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: BHASKAR H IYER(2021A7PS2223P)

Student Write-up:

PS-I Project Title: AI/ML Misogynistic Meme Identification

Short Summary of work done: Completed a course on machine learning specialisations. Built a machine learning model which can identify misogynistic memes with 75 percent accuracy

Objectives of the project: To create a machine learning model that can identify if a meme is misogynistic or not

Tool used: Google Colab, Python

Details of Papers/patents:NA

Brief description of the working environment: The organisation helped in multiple ways, suggesting resources to learn and guide through various approaches of building the model. Weekly meetings ensured proper communication and regular updates of our progress and difficulties faced. The working environment was stress free and deadlines were reasonable with particular emphasis on our learning outcomes.

Academic courses relevant to the project: Machine learning

Learning Outcome: Learnt about ML and deep learning

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: SIDDHARTH S SHAH(2021A7PS2428P)

Student Write-up:

PS-I Project Title: AIML Mysogynistic Meme Identification

Short Summary of work done: Built an ML Model for the beforementioned topic with a 75+% accuracy

Objectives of the project: To create an AI/ML model that can detect and classify memes that are Mysogynistic

Tool used: Google colab, Python

Details of Papers/patents:NA

Brief description of the working environment: The organization offered materials to learn from and provided guidance on various model-building techniques, among other ways of aiding. Weekly meetings made that there was clear communication and frequent updates on our successes and challenges. There was no stress in the work environment, and the deadlines were realistic, with a focus on our learning objectives.

Academic courses relevant to the project: NA

Learning Outcome: Learnt AI/ML, along with NLP, and python libraries such as numpy, pandas, tensorflow etc.

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: HARSHINI MADDALA .(2021AAPS0529H)

Student Write-up:

PS-I Project Title: Explainable Detection of Online Sexism-ML/NLP Project

Short Summary of work done: We were provided with a paper that included our task/project title. It involved the completion of three tasks: Task A: Detecting whether content is sexist or not Task B: Categorical separation into 4 categories Task C: Multi-classification with 11 fine-grained sexism vectors. Our main aim was to successfully complete all of the three tasks, we used traditional models like logistic regression, random forest, decision tree as well as advanced models like BERT to improve the accuracy of all the tasks assigned. We went through various GitHub repositories to finetune and understand relevant implementations. Finally, we drew reports comparing and trying to understand why there were differences in accuracies, f1 scores and other metrics using different models.

Objectives of the project: To successfully create an ML model that explainable detect online sexism, including comments from platforms like Twitter and Reddit.

Tool used: Python, different NLP techniques libraries and algorithms, spaCy and NLTK models

Details

of

Papers/patents: <https://docs.google.com/document/d/14zlnSAq75Pzc93S1pn557mAshVijdjy2XLwr98e8v5k/edit>

Brief description of the working environment: We worked as a team of 4, online. Our mentor was very supportive of the project and helped us explore and expand our interests in the field of Machine Learning. We had a meeting once every week with our mentor, who clarified our doubts regarding the algorithms and gave us information and links to various learning resources.

Academic courses relevant to the project: Machine Learning

Learning Outcome: It is essential to improve prediction quality to improve decision-making such as post-removal, and user ban, among others. The main objective of this work was to propose a methodology and explore the use of different transformers architectures for two tasks: sexism detection and sexism classification.

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: SRILASYA CHENNAREDDY .(2021AAPS0553H)

Student Write-up:

PS-I Project Title: ANALYSIS OF GOVERNANCE IN THE METAVERSE WITH THE CASE STUDY OF DECENTRALAND

Short Summary of work done: This project aims to examine the significance of governance in the Metaverse Platforms. It provides a detailed analysis on decentralized governance while considering the case study of Decentraland, a platform where individuals can generate, explore, and profit from various forms of content and applications. It incorporates metaverse concepts like VR, blockchain technology, user-created content, etc. An organization formed by the users' community called Decentralized Autonomous Organization abbreviated as DAO is responsible for managing the platform.

Objectives of the project: Examine the significance of governance in the metaverse platforms with the case of study of Decentraland which follows DAO- based decentralized governance

Tool used: --

Details of Papers/patents:--

Brief description of the working environment: Mr. Manoj Garg assigned additional mentors, each responsible for four groups. The working atmosphere varies depending on the individual mentor's preferences. While our mentor conducts weekly meetings (occasionally once in two weeks), some other mentors hold daily meetings. Given that our project involves analysis, we are required to extensively review research papers suggested by our mentor and share our insights during the weekly meetings.

Academic courses relevant to the project: --

Learning Outcome: Familiarize ourselves with the advancements in the Metaverse technologies, understanding the importance of a good governance framework in the metaverse platforms.

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: JAYESH TOTLANI .(2021AAPS1815H)

Student Write-up:

PS-I Project Title: Explainable detection of online sexism

Short Summary of work done: Made 3 models Logistic regression, decision tree, random forest tree. Used NLTK library for preprocessing data before apply ML. Highest accuracy we got was 84%

Objectives of the project: Make a NLP model to classify comment into sexist or non sexist, if classified as sexist then into further categories

Tool used: Scikit learn, pandas,numpy,NLTK

Details of Papers/patents:None

Brief description of the working environment: It was online ps, mentor kept meet once in a week, he gave ample amount of time to complete task but he didnt gave directions properly how to learn , we figured out that by ourself

Academic courses relevant to the project: Machine Learning

Learning Outcome: Learnt Basic ML and NLP

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: LOKESH ARAVIND SARAVANAN .(2021AAPS2906H)

Student Write-up:

PS-I Project Title: JiOmele

Short Summary of work done: During PS-I, the focus was on mobile app development, specifically creating a chat-video conferencing app inspired by Omegle. The work involved utilizing technologies like Node.js and React Native for backend and frontend development respectively. Key tasks included setting up app development tools, learning Git and GitHub for version control, exploring React Native CLI and building features like username input, interests selection, matching algorithm, and video call initiation. The internship also involved troubleshooting backend issues, learning Node.js for backend support, and redesigning the frontend with improved UI elements, color schemes, flexboxes, and loading indicators.

Objectives of the project: Our project aims to create a secure and anonymous chat-video conferencing app, inspired by Omegle.

Tool used: Development tools - (laptop), (Node.js, React Native, Git, GitHub, Agora UI Kit, Visual Studio Code, Command-line interface (CLI) tools)

Details of Papers/patents: During the internship, no papers or patents were published or filed. The focus of the internship was primarily on hands-on learning and practical application of app development skills rather than academic research or intellectual property development. The

Brief description of the working environment: The working environment during the PS-I internship was collaborative and conducive to learning. The company set clear expectations for the interns, emphasizing the focus on mobile app development and creating a chat-video conferencing app from scratch. The interns were expected to gain proficiency in relevant technologies such as Node.js and React Native, while also learning about backend integration, API usage, and UI/UX design principles. Throughout the internship, there was a strong emphasis on hands-on learning, allowing interns to apply theoretical knowledge into practical projects. Regular guidance and support were provided by the company's mentors and managers to ensure a smooth learning experience. Interns had the opportunity to work on real-world challenges, troubleshoot issues, and collaborate with their peers to develop the app. The internship encouraged

exploration and self-learning, empowering interns to seek resources, tutorials, and documentation to enhance their skills and overcome obstacles.

Overall, the internship provided a valuable learning experience in mobile app development, teamwork, problem-solving, and project management, setting a solid foundation for future endeavors in the field.

Academic courses relevant to the project: Mobile Application Development,
Web Development,
Software Engineering,
User Interface (UI) Design,
User Experience (UX) Design,
Database Systems,
Networking and Communication,
Algorithms and Data Structures,

Learning Outcome: The major learning outcomes of the internship include gaining proficiency in mobile app development using technologies like Node.js and React Native, understanding the implementation of chat-video conferencing functionalities, learning to work with APIs and backend integration, acquiring knowledge in UI/UX design principles, and honing problem-solving skills in the context of app development.

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: AYUSH NIGAM .(2021AAPS3012H)

Student Write-up:

PS-I Project Title: Jio Matrix

Short Summary of work done: We had to develop an app like Omegle that matches strangers based on their preferences for which we had to use an ML training model Word2vec that creates the characteristic vectors for any word ,in short defining it to the computer in its own way .We also used React and Node for frontend and backend development and also a skeletal framework name Agora that provides a video-conferencing app package on which we can build our project.

Objectives of the project: App Development along with ML models

Tool used: ReactNative, NodeJS, Agora UI Kit, Word2vec

Details of Papers/patents:--

Brief description of the working environment: We had a peaceful working environment ,work-laden obviously but the workload was enough to keep us busy and also didn't threaten us. The Jio mentor and our PS faculty was quite supportive throughout the duration and the company had maintained its standards of delivering a perfect working environment like their Virtual Machine, their server which make us feel a working intern. I also learned taking up challenges, learning new things within short time ,meeting up deadlines that overall open me up to the real industry.

Academic courses relevant to the project: Computer Programming(CS F111)

Learning Outcome: Machine learning, App Development

PS-I station: Jio Platforms Ltd - IV , Hyderabad

Student

Name: AKHIL KUMAR MISHRA .(2021B3A70929H)

Student Write-up:

PS-I Project Title: Jiomeet

Short Summary of work done: We did The project using react native,node.js and Git and used Agora UI kit to integrate video calling facilities if the users interests match . For matching we trained a model with more than 10,000 words to find similarities in the hobby strings.

Objectives of the project: To develop an app that replicates the functioning of Omegle

Tool used: React native,GitHub , node js,Agora,word2vec

Details of Papers/patents:None

Brief description of the working environment: The company is very organized in its working and the mentors were also very supportive.

Academic courses relevant to the project: OOPS

Learning Outcome: Learnt cross platform AppDev and usage of Git

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: PARAM GUPTA .(2021A3PS0236P)

Student Write-up:

PS-I Project Title: JioMeet - Native Android App Development

Short Summary of work done: The work done essentially acted as a form of structured learning. We were able to apply what we learnt in real time, thus cementing the knowledge in our mind through a hands-on approach. Our mentor provided us with learning tasks that taught us industry-standard concepts while we developed simple applications simultaneously to gain practical knowledge. Beginning from Android architectural patterns (MVC, MVP, MVVM), we learnt about the Android Activity Cycle, how to design in XML, perform database management through SQLite, make HTTP requests through Retrofit API calls. Later, we moved on to more complex techniques implementing current industry-level technology, such as using Kotlin instead of Java, designing apps through the Jetpack Compose libraries, data manipulation using Room and Firestore, user authentication through Firebase, Pagination, Navigation in a single Activity format, data sharing through Shared Preferences, and dependency injection using Dagger-Hilt. Most importantly, we learnt in detail about Git Flow and how developers in the industry use GitHub for collaboration. At the end of the project, we have developed a NewsApp as a team, collaborating through GitHub, implementing all of our learnings up till now.

Objectives of the project: To acquire knowledge and skills in native android app development, enabling us to contribute towards the betterment of the JioMeet App.

Tool used: S/w tools used :- IDE = Android Studio; Languages = Kotlin, Java; Important tools and libraries = SQLite, Git, Jetpack Compose, Room, Retrofit, Firebase, etc.

Details of Papers/patents:NA

Brief description of the working environment: The PS station operated in a Work From Home (WFH) manner. We had regular meets (daily) with our mentor, wherein we updated him with our work, and he set the next tasks to be achieved. He had created a good environment for us, being readily available through a variety of platforms at any time, to solve our problems. On receiving the project, I had 2 main expectations from the company: 1) To learn the flow of work in the IT industry. 2) To be able to independently create an Android application in the future.

Both expectations have been met with flying colours. I have a clearer understanding of how software developers collaborate to produce applications as well as now feel confident in my ability to create an Android application to achieve any task I want.

Academic courses relevant to the project: NA

Learning Outcome: The knowledge acquired through the project enables us to be able to create a native Android application from scratch. We are now at a position to be able to further pursue app development and contribute effectively to the Android app developers' community.

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: DEV GALA .(2021A7PS0182H)

Student Write-up:

PS-I Project Title: News App

Short Summary of work done: Developed an app that can fetch, search and save news articles in multiple languages. The app also incorporated Google Auth and saved profile information in firebase.

Objectives of the project: Learn about latest technologies that are used in android development at the industry level

Tool used: Android Studio

Details of Papers/patents:NA

Brief description of the working environment: Mentor kept regular meet and also taught very useful concepts for software industry

Academic courses relevant to the project: Object oriented programming, database management systems

Learning Outcome: Android Development

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: SHETHIA PRIYANK NITIN .(2021A7PS0657P)

Student Write-up:

PS-I Project Title: JioMeet

Short Summary of work done: Learnt various state of the art technologies being used in the industry in the field of app development and used these to implement more than 10 minor projects. Researched on the implementation of few features which can be integrated into JioMeet. Developed a News Application of commercial standard using all the concepts learnt.

Objectives of the project: Make small projects which can be integrated with JioMeet

Tool used: Android Studio, Git

Details of Papers/patents:None

Brief description of the working environment: The mode of operation was online. We worked in a team of 3-4 where each team had been allotted a mentor from the industry. Our mentor had regular meets with us(>2/week). In the meets, he introduced to various concepts and libraries used in the industry, suggested resources and asked us to implement the same in an app. Workload was manageable. The mentor reviewed our work and gave feedback in the next meet. Most meets went on for more than 2 hrs and he put in honest efforts. However, in the later part he wasn't able to dedicate much time

as he was busy. However, the experience varied greatly among teams depending upon their mentor. In all, it was a good experience and I was able to learn App development from scratch to an advanced level. It would have been better if we would have provided more opportunities to work closely with Jio's team on their actual projects.

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

Learning Outcome: 1)Native Android development in Java and Kotlin
2)Got familiarized with android standard technology and used them in making apps. These include MVVM, Jetpack compose, room, retrofit, pagination and many more.
3)How to use Git flow in a real project and the importance of writing clean code
4)Logical thinking that goes in making an App and communication skills

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: PRATYUSH SUVARNA(2021A7PS1441G)

Student Write-up:

PS-I Project Title: Chat App

Short Summary of work done: Leant Flutter and Dart and how an application is built using Flutter. Made a chat application where a user can chat with multiple users. Added reply functionality and local storage using various Flutter packages. Also used BLoC architecture for making the app.

Objectives of the project: Building the frontend of a chat application using flutter and dart

Tool used: Vscode, Android emulator

Details of Papers/patents:N/A

Brief description of the working environment: It was a remote PS. The company assigned us a personal project in a group of three. Most of the projects were some web

or app dev. We were given an app dev project using Flutter. We had to make a chat application and add some basic functionality and a clean UI.

Academic courses relevant to the project: DSA, OOP

Learning Outcome: Learnt Flutter and Dart. Learnt the proper coding practices in a professional environment using proper organization of code.

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: ACHINTHYA HEBBAR S .(2021A7PS1457P)

Student Write-up:

PS-I Project Title: App Development in Flutter

Short Summary of work done: Our team was appointed to the Flutter Development team in Jio, a relatively new unit with an agenda to migrate specific applications to cross-platform solutions. I designed a chat interface leveraging Flutter's capabilities, incorporating functionalities such as reply, delete, local storage, HTTP calls, and emoji reactions. The primary goal was the adoption of efficient strategies to reduce the computational burden on the application engine. This optimization was accomplished through a blend of reactive programming via bloc, coupled with the strategic positioning of listeners at the most feasible points in the widget tree hierarchy. This setup minimized the number of widgets needing repainting by the Flutter engine, significantly enhancing overall performance and efficiency compared to using simple solutions like setState().

Objectives of the project: Construct a sandbox project (Chat Application) using Flutter, incorporating standard practices for state management in accordance with industry norms.

Tool used: Android Studio, Flutter, Packages : BLoC, freezed, hive

Details of Papers/patents:NA

Brief description of the working environment: At the start, our assignment was to contribute to a newly started Flutter project under development by Jio employees.

However, we faced an unexpected challenge: the virtual computers allocated to us possessed insufficient computational capabilities. This limitation prevented the installation of relevant software such as Android Studio and Visual Studio Code, which are crucial to our project work. In response to this hindrance, we devised an alternative approach. We established a 'sandbox' project on our personal computers, with the source code subsequently reviewed by our mentor for approval. To ensure effective communication and regular tracking of project advancements, we initiated meetings on JioMeet, occurring either on a weekly basis or, when necessary, daily.

Academic courses relevant to the project: Object Oriented Programming

Learning Outcome: State Management in Flutter using BLoC

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: VAIBHAV SINGLA .(2021A7PS2227P)

Student Write-up:

PS-I Project Title: Jiomeet

Short Summary of work done: My PS station aimed at training us and developing some technical skills, rather than involving us in their projects. I was asked to learn front-end development in AngularJS. I was given a few self-learning projects to practically apply whatever I learnt. The tasks were categorized separately for HTML/ CSS, Javascript/Typescript and Angular. When I made the basic learning tasks, I showed them to my mentor and then he gave us our final project that was building a basic WebRTC application like Jiomeet with very limited features.

Objectives of the project: Learning and getting experience in front end development with AngularJS as tech stack

Tool used: AngularJS

Details of Papers/patents:NA

Brief description of the working environment: I expected to work on a real company project, but Jio only wanted to train us instead of involving us in their projects. We had a few meetings with the mentor guiding us for making self projects and ensuring learning. Though there were a couple of weeks in between when we could not communicate with him but after that he held a meeting to review all the work we did till that time and explained how we could proceed further. Working hours were flexible as we were assigned some tasks and we didn't have meeting with the mentor everyday, rather we met weekly or sometimes biweekly.

I learnt a lot from my PS. I already had prior knowledge to front-end development but had never worked on Angular. So I learnt Typescript and AngularJS during PS-I. I also practiced that by making projects. I also developed a little bit of understanding how video-conferencing applications work, and about media engines that help establishing connection between calls.

Academic courses relevant to the project: NA

Learning Outcome: HTML, CSS, Javascript, Typescript and AngularJS

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: NISHANT LUTHRA .(2021A7PS2420P)

Student Write-up:

PS-I Project Title: JioMeet

Short Summary of work done: The PS Internship involved learning and applying the concepts of web development using HTML, CSS, JavaScript, TypeScript and then moving on to complex frameworks such as Angular. All these were demonstrated using small projects along the training process. The final project was to build a video conferencing web app using WebRTC and Angular.

Objectives of the project: Understanding and Implementing Real Time Communication

Tool used: HTML, CSS, JavaScript, TypeScript, Angular, WebRTC, Agora

Details of Papers/patents:NA

Brief description of the working environment: Since PS was remote, work environment was not experienced. The industry mentor gave us good training tasks and we learnt web development from scratch to advanced concepts. We also learnt how a platform such as JioMeet works by implementing our own video conferencing application.

Academic courses relevant to the project: NA

Learning Outcome: Web Development Tech Stack with Angular, Conferencing using WebRTC

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: ROSHAN BAGLA .(2021A7PS2538P)

Student Write-up:

PS-I Project Title: JioMeet Application

Short Summary of work done: We were assigned a mentor from the company who used to assign us with tasks as well as provide resources required for learning the technologies related to the task. Built many small applications which assisted in learning web development frameworks such as React and Angular.

Objectives of the project: To Learn the tools upon which the application was built.

Tool used: HTML, CSS, Javascript, Typescript, Angular, React, Websockets, WebRTC

Details of Papers/patents:None

Brief description of the working environment: We were assigned a mentor from the company who used to assign us with tasks as well as provide resources required for learning the technologies related to the task. We were divided into groups so learnt a lot how to coordinate and work with a team. We never really worked on the main project but learnt the things required for working of it and built side projects related to the main project.

Academic courses relevant to the project: None.

Learning Outcome: Learnt many technologies and software used in the project such as WebRTC, Websockets, and different web development frameworks such as Angular, React.

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: ARYAN NAMBIAR(2021A7PS2619G)

Student Write-up:

PS-I Project Title: Jio Meet

Short Summary of work done: Got to implement weather forecast app, todo app and some other small projects

Objectives of the project: Learning frontend development and implementing it efficiently

Tool used: Vs code, api platforms and manager provided sources to learn

Details of Papers/patents:Na

Brief description of the working environment: It would be better if we were provided projects which were related to jio meet

Academic courses relevant to the project: NA

Learning Outcome: Learned concepts of frontend dev and got to implement on real life projects

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: ABHISHEK JOSHI .(2021A7PS2727H)

Student Write-up:

PS-I Project Title: JioMeet

Short Summary of work done: We were asked to learn the different technologies used in JioMeet web application, through various sources given to us by the mentor. We learnt the fundamentals of web development and more advanced technologies like Angular and WebRTC. We built various projects using these to showcase our learnings. Finally we built a video calling app, so that we can understand how to work on the actual product.

Objectives of the project: Learn and implement the various technologies used in JioMeet

Tool used: HTML, CSS, JavaScript, Angular, WebRTC

Details of Papers/patents:none

Brief description of the working environment: Our station worked in online mode, so we had online meets with our mentor. Moreover, most of the communication was done through emails and WhatsApp. We were only expected to complete our learning tasks as the internship duration was not sufficient to allow us to work on the actual product.

Academic courses relevant to the project: Object Oriented Programming, Computer Programming

Learning Outcome: Learnt the basics of web development along with more specialized tools such as Angular and WebRTC

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: ANURAV GARG .(2021A7PS2782H)

Student Write-up:

PS-I Project Title: JioMeet

Short Summary of work done: Very little work was done as we were rarely contacted by the PS station. Our first task was to learn basic HTML/CSS and basic JavaScript with simple sample projects (like a calculator webpage), and then learn basic Angular and use it to make a to-do application frontend. Our second task was to use WebRTC to test a user's webcam and microphone.

Objectives of the project: To get a basic understanding of frontend web development, the Angular framework, and WebRTC

Tool used: HTML, CSS, JavaScript, Angular, WebRTC

Details of Papers/patents:-

Brief description of the working environment: The station rarely ever communicated with us. During our orientation we were told we'd work on the company's codebase for JioMeet, but not only did we never get to do that, we were almost never given any guidance for even our simple learning projects. Our mentor wouldn't reply to our messages for weeks, and didn't look at or give feedback on anything I made. In saying "try make a to-do app in angular, and learn about WebRTC", I have now given you about as much guidance as our mentor gave me during PS-I.

Academic courses relevant to the project: CS F213 - Object Oriented Programming

Learning Outcome: Frontend web development in Angular, and basic WebRTC

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: ADITYA KUMAR SHARMA .(2021A7PS3112H)

Student Write-up:

PS-I Project Title: Jio Matrix

Short Summary of work done: In the initial few weeks were expected to learn various technologies, then we were asked to create layouts of basic apps without any functionality. Later on we added functionalities to them. At last, we made an app implementing basic webRTC.

Objectives of the project: To know about working of single page applications.

Tool used: Angular, typescript etc

Details of Papers/patents:None

Brief description of the working environment: Working environment was good, internship did not go hectic in any way. We were expected to understand how single page web applications work by the end of the internship. For this, we learnt angular, typescript etc and made basic apps.

Academic courses relevant to the project: OOPS

Learning Outcome: Learnt basic web development using Angular.

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: ANKUR LHILA .(2021AAPS0178P)

Student Write-up:

PS-I Project Title: JioMeet Application

Short Summary of work done: We were assigned a mentor from the company who used to assign us with tasks as well as provide resources required for learning the technologies

related to the task. Built many small applications which assisted in learning web development frameworks such as Angular.

Objectives of the project: To Learn the tools upon which the application was built.

Tool used: HTML, CSS, Javascript, Typescript, Angular, WebRTC

Details of Papers/patents:None

Brief description of the working environment: We were assigned a mentor from the company who used to assign us with tasks as well as provide resources required for learning the technologies related to the task. We were divided into groups so learnt a lot how to coordinate and work with a team. Everyone was given small projects to work and learn the techstack.

Academic courses relevant to the project: None.

Learning Outcome: Learnt many technologies and software used in the project such as WebRTC, and web development framework Angular.

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: DEV PARIKH .(2021AAPS2236P)

Student Write-up:

PS-I Project Title: Jio Meet (Team Collaboration & Video Calling App)

Short Summary of work done: We were tasked with getting familiar with web development tools (majorly Angular and Typescript) and the various technologies upon which Single Page Applications are built. Therefore through the creation of various small projects, we were tasked with first familiarizing with HTML, CSS, and JavaScript. Then, we delved into Angular alongside TypeScript, to develop a To-Do app. We also worked with WebRTC (Web Real Time Communication), a method used for implementing video and audio communication over the web. A brief overview about our work: -> Developed Single Page Applications (ToDo App and WebRTC Tester) using Angular Typescript Language, which is used to build the Jio Meet App. -> Learnt and Experimented with Web

Development tools like HTML, CSS, JavaScript and other tools like Bootstrap Architecture. -> Developed and Implemented basic applications using the above tools to gain a hands-on experience. -> Brainstormed about various new features that could be implemented in Jio Meet web app. -> Reviewed the Jio Meet codebase to gain knowledge about efficient programming practices.

Objectives of the project: Exploring the field of Single Page Applications (SPAs) and their Development, using Angular Web Development Framework and Typescript. Jio Meet, Gmail, Facebook, Google Maps, Twitter etc are all SPAs.

Tool used: 1. Angular (v14.0); 2. NodeJS (v16.2); 3. NPM (Node Package Managers); 4. Git and Github; 5. IDEs (VSCode); 6. Citrix - Reliance's Remote Development Environment; 7. HTML, CSS, JavaScript

Details of Papers/patents:N/A

Brief description of the working environment: I had the opportunity to work in a dynamic and collaborative environment. The working environment was supportive, with experienced professionals who were willing to guide and mentor me throughout my internship.

My expectations from the company were to gain hands-on experience in my chosen field and to learn how theoretical knowledge translates into practical applications. I also hoped to contribute to the company's projects and initiatives in a meaningful way. I anticipated exposure to real-world challenges and the chance to develop relevant skills that would enhance my future career prospects.

Additionally, I improved my communication and collaboration skills by engaging in team meetings, presentations, and brainstorming sessions.

I had access to mentorship and received feedback on my work, which helped me improve my skills and gain insights into best practices in the industry.

Academic courses relevant to the project: Computer Programming and some knowledge of Object Oriented Programming (OOP) would be helpful.

Learning Outcome: 1. Familiarity with Angular Web Dev. Framework.
2. Development using Typescript, for making SPAs interactive.
3. Proficiency in basic frontend tools like HTML, CSS and JavaScript.
4. Professional Communication skills
5. Team work and collaboration.
6. Presentation and Report writing skills.

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: VASUDEV MAJHI .(2021B2A72750P)

Student Write-up:

PS-I Project Title: Building A Web RTC from strach and Using Agora SDK to build a video conferencing web application

Short Summary of work done: Build a Web RTC from strach and also build a Video conferencing web application using Agora sdk

Objectives of the project: To learn how to integrate SDk's and API's with our project. Understand of the web RTC architecture

Tool used: Agora SDK, Html, css, javascript, Signalling servers, WebRtc, figma, github and low code

Details of Papers/patents:Nope

Brief description of the working environment: It was Online. The mentor was supportive helped us continuously in building the project. Hr was approachable and Everyone was kind and friendly with the interns.

Academic courses relevant to the project: Computer programing

Learning Outcome: Api integration and Web RTC architecture

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: ABHAY GUPTA .(2021B3A70971H)

Student Write-up:

PS-I Project Title: Testing Jio Meet

Short Summary of work done: Majority of our time was spent in testing various features of Jio Meet, towards the end we built our own video conference application using html, css, javascript and Agora. We also learnt about API testing using Postman.

Objectives of the project: To test Jio Meet application

Tool used: Html, Css, Javascript, Postman

Details of Papers/patents:None

Brief description of the working environment: The work environment in the company is good and one can maintain healthy work life balance. The chief learning from the PS-1 at Jio Platforms is learning html, css and javascript. From our project we learnt to integrate API and we also briefly looked at API testing using Postman.

Academic courses relevant to the project: Computer Programming

Learning Outcome: Learnt API testing and concept of Media Engines

PS-I station: Jio Platforms Ltd , Mumbai

Student

Name: ANSHUL MAHESHWARI .(2021B5A70900P)

Student Write-up:

PS-I Project Title: JioMeet

Short Summary of work done: We Implemented WebRTC and Agora SDK by making video conferencing applications and also tested the JioMeet Platforms on different Media Engines namely Agora and JM Media

Objectives of the project: UAT Testing and Implementing WebRTC and Agora

Tool used: HTML, CSS, JavaScript, WebRTC API, Agora SDK

Details of Papers/patents:NA

Brief description of the working environment: The Working Environment was good and supportive. I expected some Machine Learning or App Development work but instead we were assigned to a testing Project. However we as a team decided to implement the knowledge of Media Engines that was taught and developed 2 video-conferencing Web Apps. We learned about HTML, CSS, JavaScript, WebRTC API, Agora SDK also we greatly improved our communication and interpersonal skills.

Academic courses relevant to the project: Computer Programming (CS F111)

Learning Outcome: Got to learn HTML, CSS, JavaScript, WebRTC API, Agora SDK ,Postman

PS-I station: LightSpeed Photonics Pvt Ltd , Secunderabad

Student

Name: VASUDEVAN PILLAI A .(2021A3PS0884H)

Student Write-up:

PS-I Project Title: Testing and Quality Check of Optical Interconnect

Short Summary of work done: My project was to test the Lightspeed's optical interconnect product. Through the testing process we learnt many things such how to perform continuity test to breakout boards by reading the schematics. I also developed a code for the company, which helps them read or write to the registers in the optical interconnect.

Objectives of the project: Test and Quality check the company's optical interconnect

Tool used: Arduino IDE, STM32 Microcontroller

Details of Papers/patents:NA

Brief description of the working environment: The startup energy was amazing, got a feel how start-ups work, how much ground work they need put is immense.

Academic courses relevant to the project: DD, MPI, MEC

Learning Outcome: Hardware testing, Arduino IDE, C/C++

PS-I station: LightSpeed Photonics Pvt Ltd , Secunderabad

Student

Name: ROHAN MISHRA .(2021A3PS1394P)

Student Write-up:

PS-I Project Title: Clock IC simulation and generation of their configuration file

Short Summary of work done: The goal was to obtain the configuration files for clocks connected to FPGA which was a part of a much bigger design called LightSiP. Two softwares were provided to me and many resources. The configuration had to be such that it satisfied the phase noise and jitter requirements of the FPGA

Objectives of the project: Understanding Clock distribution network and Performing Clock IC simulation on 'Lab on the Cloud' software by Renesas and analyzing their jitter and noise components. Understanding the clock frequency requirement for our product and generating the configuration files using Renesas RICBox software. (RC32514A & XTL322100)

Tool used: Lab on the Cloud, Renesas IC Box

Details of Papers/patents:None

Brief description of the working environment: The working environment was decent. The people around were friendly and you could easily talk with them. The company is a startup with not many employees and everyone was very easily reachable.

Academic courses relevant to the project: Microelectronic Circuits,Digital Design, Signal and System, IOT

Learning Outcome: My project was a research oriented project. The outcome of my PS-1 might be small I got to learn a lot through the process of research. I learnt about FGPAs, importance of clock in FPGA, how to read a data sheet, how to find the pin configuration. I learnt Static timing analysis and other related topics through the process of figuring out myself.

PS-I station: LightSpeed Photonics Pvt Ltd , Secunderabad

Student

Name: KUSHAL LAXMIKANT LOYA .(2021A3PS2640P)

Student Write-up:

PS-I Project Title: Temperature and Voltage Sensing

Short Summary of work done: Built a temperature and Voltage sensor which would monitor the temperature and voltage. Used Verilog code in order to do so. Also introduced features like ALRTn and Overtempn which would alert the system when the threshold temperature has reached and also can perform functions like shutdown the system or turn on fan.

Objectives of the project: Building temperature and voltage sensor which would be used to read, monitor the temperature and voltage and also alert the device for high temperature.

Tool used: S/w = VHDL, Verilog. H/w = MAX V, Arria 10 FPGA, LTC 2418.

Details of Papers/patents:.

Brief description of the working environment: The environment here is quite good and friendly. The company being a startup, provides personalized guidance but at the same time you need to figure out some things that no one can tell you; they may guide you, but ultimately you are the one figuring it out, and that's the best part of it. That's how you learn and grow!!

Academic courses relevant to the project: DD (Digital Design)

Learning Outcome: Teamwork, Learning new languages which would be of immense help if one wants to pursue a career in electronics core sector.

PS-I station: LightSpeed Photonics Pvt Ltd , Secunderabad

Student

Name: YASH(2021A8PS3049G)

Student Write-up:

PS-I Project Title: FPGA temperature monitoring system and voltage sensing system

Short Summary of work done: I was working for the LightSip product of the company. Developed and implemented an FPGA-based temperature monitoring system using Max 10 FPGA and SMBus interface. Designed and coded VHDL logic to read data from two temperature sensors and successfully displayed the output on the NIOS II console. Worked with Intel Quartus Lite and model-sim/Questasim tools for FPGA development and simulation. The aim was to read the temperature of ICs of Intel Arria 10 through Max 10 CPLD and MAX 1619 Temperature sensor. Demonstrated proficiency in ADC working principles and utilized this knowledge to interface with the temperature sensors. Collaborated with a team to integrate the temperature monitoring system into a larger project, ensuring seamless functionality and compatibility. Our second aim was to sense the voltage of power ICs of FPGA board and communicate it through SPI protocol. Participated in the development of SPI interfaces to monitor voltage sense signals of Power ICs from Max 10 FPGA. Identified and resolved issues related to temperature sensor readings and voltage sensing. Conducted thorough testing and verification of the temperature monitoring and voltage sensing systems, ensuring accurate and reliable data acquisition.

Objectives of the project: Read the data from two temperature sensors using Max 10 via SMBus interface and display the output on NIOS II console and Monitor the voltage sense signals of the Power ICs from Max 10 using SPI interface.

Tool used: Software: Intel Quartus Prime, Model-sim, VHDL, Verilog Programming Platform Designer, Eclipse Ide. Hardware: Intel Arria 10 FPGA, Max 10 CPLD.

Details of Papers/patents:NA

Brief description of the working environment: The working environment was good. Freedom was given to us for deciding our everyday's tasks. At the end of each day, our mentor reviewed the work progress. At the end of each week, we have to give a progress report to our manager in charge. They always monitor our progress and always guided us. Also, we were allowed to the testing lab for implementing the codes on Fpga board.

Academic courses relevant to the project: Digital Design, Microprocessors and Interfacing, Computer Programming, Verilog Programming

Learning Outcome: Learnt FPGA architecture, VHDL and Verilog Programming, Communication Protocol such as SPI and I2C protocol. Testing and Verification in Intel quartus prime, simulation in Model SIm.

PS-I station: Mel Systems and Services Ltd , Chennai

Student

Name: PRITHVI SOWMYA .(2021A3PS1653H)

Student Write-up:

PS-I Project Title: SWAS Board GSM interfacing

Short Summary of work done: The goal of this project was to create a working model for a system which could monitor different aspects of air quality and publish them to a server for global access, via a telecom network enabled device (using a GSM module). •

The GSM module (EC20 in this case) was compatible for the aspects needed to performed, i.e connect to an MQTT broker and publish data periodically. • The BME680 sensor was perfectly compatible with the ESP32 microcontroller • The aforementioned sensor was able to collect fairly accurate measurements of temperature, humidity, pressure, and other aspects of air quality. • The aforementioned microcontroller was able to interface with the GSM module (EC20) seamlessly and publish AT commands to said module, to initialize the module, and perform the other required initialization processes for this project's needs such as connecting to an MQTT broker, setting a ClientID for the SWAS device, and publish data to the broker under a specific topic in a string format. • Data was successfully ported from the BME680 sensor to the ESP32 which then transferred the data to the GSM module EC20 which published this data onto the broker. This was made into a periodic process, with variable periodicities by changing the delay. The EC20 module was successfully interfaced with the existing SWAS board

(Version 2)-Which is only Wi-Fi and LAN compatible. This effectively made this board in a tentative prototype of the 3rd version of the board, which will come with GSM compatibility according to a client's specifications. Schematics have been designed for successful integration of the EC20 module into the existing design of the SWAS board. This results in efficient PCB designing when required.

Objectives of the project: Connecting and interfacing with a GSM module, uploading data to it via MQTT. Experiment on an already existent device for measuring indoor air quality.

Tool used: Arduino IDE, Quectel AT command s/w, ESP32, EC20, UMTS EVB KIT, BME680,

Details of Papers/patents:N.A

Brief description of the working environment: Working environment is decent, and colleagues are pleasant to interact with. Mentor is a really wonderful and helpful person. He clears all doubts a student may have. Project was interesting and quite the learning experience. Work life balance is skewed more towards the work side. The company is extremely strict with respect to timings and the timings are quite long as well (9-6.30 p.m). Expectations with relation to project and mentor were met perfectly, although expectations with respect to the company was not met.

Academic courses relevant to the project: Microprocessing and Interfacing, Microcontrollers, foundations of Data structures and algorithms, Control Systems

Learning Outcome: Microprocessing & Interfacing, Document Referencing, Sensors, Microcontrollers, Arduino IDE.

PS-I station: Mel Systems and Services Ltd , Chennai

Student

Name: SAI SARVESH D S .(2021A3PS2648P)

Student Write-up:

PS-I Project Title: Sixdime SWAS 3.0

Short Summary of work done: In this project, an ESP32 microcontroller is interfaced with an EC20 cellular module and a BME680 sensor. The goal is to transmit environmental data from the BME680 sensor to an MQTT client using a Mosquitto MQTT broker. The ESP32 communicates with the EC20 module over a serial interface, enabling it to access the internet and connect to the MQTT broker. The BME680 sensor measures various environmental parameters such as temperature, humidity, pressure, and air quality. The ESP32 reads data from the BME680 sensor and packages it into MQTT messages, which are then published to the Mosquitto MQTT broker. The MQTT client, which can be a smartphone or computer, subscribes to the relevant topics on the broker and receives real-time environmental data updates. This integration allows for remote monitoring and analysis of the environmental conditions through the MQTT client, making it a versatile and efficient IoT solution. Finally, we also sketched the schematic of the whole project.

Objectives of the project: Interfacing GSM Module with BME680 sensor and ESP32 and send data to MQTT client

Tool used: H/W - ESP32 , EC20 , BME680 ; S/W - Mosquitto MQTT broker , Arduino IDE , KiCad

Details of Papers/patents:-

Brief description of the working environment: There specifically were no pre-requisites mandated by the company. The working environment was good and I learnt a lot from this company. I was assigned to the New Product Development department and all the staffs in this department were helpful. My mentor helped us a lot and cleared all the doubts that we had. I was able to improve and learn on a lot of aspects, including but not limited to things such as the work environment inside a research facility, improved social and presentation skills, etc. The only con that I had was that the working hours were long compared to other PS-1 stations.

Academic courses relevant to the project: Microprocessors and Interfacing was an academic course relevant to the project.

Learning Outcome:

1. Getting to work with microprocessors and sensors
2. Learning to code with Arduino IDE
3. Learning to draw schematic using KiCad
4. Getting to know about MQTT protocol and set up a MQTT client

PS-I station: MELUX CONTROL GEARS PVT.LTD. , Pune

Student

Name: ISHAN AJAY GOKHALE(2021A3PS1536G)

Student Write-up:

PS-I Project Title: SMPS testing data collection using RS-485 protocol, Production of Transformers and Line Filters, Ballasts for lamps, PCB Design and Manufacturing, and design of LED Drivers without the use of Microcontrollers

Short Summary of work done: Mostly worked in testing of SMPs, PCB Design, RS-485 protocol, production of line filters and transformers, attachment of other components like resistors, capacitors, and diodes to the SMPs and ballast PCBs

Objectives of the project: Learning about Production, Communication Protocols, Quality Control, and a bit of digital electronics

Tool used: EAGLE, Python

Details of Papers/patents:NA

Brief description of the working environment: It was fair enough; employees were ok and mentors guided us

Academic courses relevant to the project: Power Electronics, Electrical Sciences, a little bit of Digital Design, and a very tiny amount of Embedded Systems

Learning Outcome: Got an in-depth understanding of the RS-485 protocol and its various applications.

Learn more about SMPs and the types of errors that can occur during their testing.

Got to know about PCB design and how PCBs are made in industry, both manually as well as with CNC milling machines.

Learned about schematic design and the good practices while designing a schematic of a circuit.

Learned about the types of embedded electronics sold by industries and got to learn about the drawing of system function flowcharts.

I learned about Openpyxl and the management of Excel sheets using Python.

Learned about the ISO-9001 protocol for product development and quality standards.

Learned about components like active power line filters, transformers etc. which play a crucial role in running SMPs and ballast circuits.

Gained crucial insights into how one can design circuits without using microcontrollers everytime and enhanced my own digital design and transistor based circuit design skills.

PS-I station: MELUX CONTROL GEARS PVT.LTD. , Pune

Student

Name: SIDDHARTH DESHMUKH .(2021A4PS2672P)

Student Write-up:

PS-I Project Title: Aurduino and Manufacturing

Short Summary of work done: Learned about Manufacturing proceses, hands on PCB making, testing and quality assurance, learned aurduino coding.

Objectives of the project: Learn about making projects in aurduino and learn about the Manufacturing of PCB's, learn about testing and quality assurance of PCB's.

Tool used: Tinker Cad, Aurduino UNO, PCB tester prgrams.

Details of Papers/patents:None

Brief description of the working environment: Working environment was good, safety was taken into account. Comapny wanted us to be disclined be regular.

Academic courses relevant to the project: C programming.

Learning Outcome: Learned about Manufacturing proceses, hands on PCB making, testing and quality assurance, learned aurduino coding.

PS-I station: MELUX CONTROL GEARS PVT.LTD. , Pune

Student

Name: ADITYA VERMA .(2021A8PS2708P)

Student Write-up:

PS-I Project Title: Integrating Hardware and Programming for Enhanced Electrical Systems: Projects on Line Filters, PCBs, Arduino, and STM8 Programming.

Short Summary of work done: My PS-I internship at Melux Control Gears Pvt. Ltd. gave me the chance to learn about a variety of facets of the electronics business. Microcontroller programming and the creation and testing of electronic components were the two main divisions of the internship. I used both Arduino and STM8S microcontrollers throughout the programming process of the microcontroller. Starting with Arduino offered a user-friendly environment for learning the essentials, such as using sensors and digital inputs and outputs. After studying the architecture and peripherals of the more sophisticated STM8S microcontroller, the information obtained was applied there. I worked on line filter design and the creation of common-mode inductor chokes in the production and testing division. In order to ensure exact specifications for the number of turns, winding direction, and speed, I controlled a copper coil winding machine. To fulfil quality requirements, I also performed lead cutting, soldering, and inductor choke adjustment. Additionally, I assisted in testing LED strips and LED driver units for CCTV cameras to ensure operation and performance and attached ferrite cores to transformers to enhance their magnetic qualities. Through debugging and troubleshooting procedures, I improved my problem-solving abilities during the internship. I gained knowledge of technical document analysis and efficient microcontroller feature use. The experience also brought home the value of documentation, which makes it possible to move projects along quickly and make adjustments afterwards. Overall, this internship gave me practical experience in producing electrical components and programming microcontrollers, giving me transferable skills for my future endeavours.

Objectives of the project: The project's goals are to create, develop, and implement a solar-powered LED driver using microcontroller programming techniques and to gain real-world experience manufacturing and testing crucial electronic components, which will help the production department's manufacturing and quality control processes run more smoothly.

Tool used: The following pieces of hardware and software were used: Hardware: Arduino: For prototyping and the early phases of development, Arduino boards were used. For those new to microcontroller programming, Arduino offered a user-friendly platform that made it

Details of Papers/patents:-

Brief description of the working environment: During my internship, Melux Control Gears Pvt. Ltd. provided a vibrant and interesting work atmosphere that encouraged my growth and development. I was inspired to take on a variety of jobs across the production and research & development divisions by the organization's emphasis on innovation and performance. I learned a great deal about programming microcontrollers, designing

embedded systems, and producing electrical components while working on projects using Arduino and STM8S microcontrollers.

I was exposed to every stage of product development throughout my internship, from design and prototyping to testing and quality assurance. It was a revolutionary learning experience that improved my technical knowledge, problem-solving capabilities, and documentation talents.

Academic courses relevant to the project: None

Learning Outcome: Utilising Arduino and STM8S microcontrollers, you may get practical expertise and understanding in microcontroller programming. I gained knowledge about how to implement different features using analogue sensors, digital inputs and outputs, and libraries.

Understanding of microcontroller architectures, GPIO pins, timers, and communication interfaces were among the topics covered in the embedded systems design course.

Debugging and troubleshooting: Through debugging and troubleshooting procedures, problem-solving abilities were developed. I acquired the ability to evaluate datasheets and technical material in order to efficiently use microcontroller capabilities and optimise code.

Production of Electronic Components: Acquired first-hand knowledge of the design, manufacture, and testing of electronic components. performed careful testing on LED strips and LED driver units for functionality and dependability, affixed ferrite cores to transformers, and operated copper coil wrapping machines for the manufacture of inductor chokes.

Testing and Quality Control: To guarantee that products meet standards, careful testing was done while learning quality control processes. LCR metres were used to test inductor chokes, and the operation, output voltage, and current of LED driver units were evaluated.

PS-I station: MELUX CONTROL GEARS PVT.LTD. , Pune

Student

Name: AVI PANDIT(2021A8PS3040G)

Student Write-up:

PS-I Project Title: arduino and stm8 designing and production

Short Summary of work done: the first project of arduino uno and stm8 was really interesting and learned a lot while doing this project. But the other project of production involved a lot of labour work such labeling boxes and cleaning LEDs which i felt was unnecessary and was very repetitive for example we were told to wind 500-600 line filter. Other than that it was good

Objectives of the project: 1)designing of code and circuit to perform certain task.
2)understand the working of production department

Tool used: tinker Cad, cosmic c, st visual programmer, st visual devloper

Details of Papers/patents:none

Brief description of the working environment: the office didnt had proper working space as the R&D and production department was combined. But our mentor was very helpful.

Academic courses relevant to the project: our first project involved the basic understanding of microcontroller

Learning Outcome: learned about basics of arduino Uno and stm8 also learned about how the production department works

PS-I station: MELUX CONTROL GEARS PVT.LTD. , Pune

Student

Name: JOHAN ISAAC(2021AAPS2609G)

Student Write-up:

PS-I Project Title: Implementation of Solar-Powered LED Driver: Microcontroller Programming and Electronic Component Manufacturing

Short Summary of work done: During my PS-I internship at Melux Control Gears Pvt. Ltd., I had the opportunity to explore diverse aspects of the electronics industry. The internship was divided into two key areas: microcontroller programming and electronic component production and testing. In the microcontroller programming phase, I worked with both Arduino and STM8S microcontrollers. Starting with Arduino provided a

beginner-friendly platform to learn the fundamentals, including digital inputs/outputs and working with sensors. The knowledge gained was then transferred to the more advanced STM8S microcontroller, understanding its architecture and peripherals. In the production and testing department, I was involved in line filter design and the manufacturing of common-mode inductor chokes. I operated a copper coil winding machine, ensuring precise parameters for the number of turns, winding direction, and speed. I also carried out lead trimming, soldering, and inductor choke adjustment to meet quality standards. Additionally, I contributed to attaching ferrite cores to transformers to optimize their magnetic properties and conducted testing on LED strips and LED driver units for CCTV cameras, ensuring functionality and performance. Throughout the internship, I honed my problem-solving skills through debugging and troubleshooting processes. I learned to analyze technical documentation and effectively utilize microcontroller features. The experience also emphasized the importance of documentation, enabling efficient project progress and future improvements. Overall, this internship provided valuable hands-on experience in microcontroller programming and electronic component production, equipping me with versatile skills for my future endeavors.

Objectives of the project: The objective of the project is to design, develop, and implement a solar-powered LED driver using microcontroller programming techniques and to gain practical experience in the production and testing of essential electronic components, contributing to the efficient manufacturing and quality assurance processes in the production department.

Tool used: The following hardware and software tools were employed: Hardware: Arduino: Arduino boards were utilized for prototyping and initial development stages. Arduino provided a beginner-friendly platform for microcontroller programming, enabling quick experi

Details of Papers/patents:-

Brief description of the working environment: Melux Control Gears Pvt. Ltd. provided a dynamic and enriching work environment that fostered my growth and development during the internship. The company's focus on performance and innovation motivated me to take on diverse tasks spanning both the research & development and production departments. Working on projects involving Arduino and STM8S microcontrollers, I gained valuable skills in microcontroller programming, embedded systems design, and electronic component manufacturing.

Throughout the internship, I was exposed to the entire product development lifecycle, from design and prototyping to testing and quality assurance. The experience enhanced my technical proficiency, problem-solving abilities, and documentation skills, making it a transformative learning journey.

Academic courses relevant to the project: None

Learning Outcome: Microcontroller Programming: Acquired practical knowledge and experience in microcontroller programming using Arduino and STM8S microcontrollers.

Learned to work with digital inputs and outputs, analog sensors, and libraries to implement various functionalities.

Embedded Systems Design: Explored the fundamentals and advanced concepts of embedded systems design, including the understanding of microcontroller architectures, GPIO pins, timers, and communication interfaces.

Debugging and Troubleshooting: Developed problem-solving skills through debugging and troubleshooting processes. Learned to analyze datasheets and technical documentation to effectively utilize microcontroller features and optimize code for performance and efficiency.

Electronic Component Production: Gained hands-on experience in the production and testing of electronic components. Operated copper coil winding machines for inductor choke production, attached ferrite cores to transformers, and conducted meticulous testing on LED strips and LED driver units for functionality and reliability.

Quality Control and Testing: Learned quality control procedures and conducted thorough testing to ensure compliance with specifications. Tested inductor chokes using LCR meters and assessed the functionality, output voltage, and current of LED driver units.

PS-I station: MELUX CONTROL GEARS PVT.LTD. , Pune

Student

Name: ABHIRAM JUTURU .(2021B4A83143H)

Student Write-up:

PS-I Project Title: Arduino Programming, Simulation and Production of Transformers, Diodes resistors and Testing of LEDs and Power management systems in CCTV and LED chambers

Short Summary of work done: The ps station assigned to me provided a dynamic work environment during the internship, fostering growth and development. The focus on performance and innovation motivated the intern to take on diverse tasks in research & development and production. Working with Arduino and STM8S microcontrollers, they acquired skills in programming, embedded systems design, and electronic component manufacturing. The internship exposed them to the complete product development lifecycle, enhancing technical proficiency, problem-solving abilities, and documentation skills. Overall, it was a transformative learning experience.

Objectives of the project: Exploring basics of arduino simulation and programing .
Learning the basics of production and manufacturing

Tool used: The internship involved using a range of hardware and software tools. Arduino boards were used for prototyping and development, while the Copper Coil Winding Machine enabled precise winding of copper coils. The LCR Meter ensured quality control of inducto

Details of Papers/patents:Referred to data sheets of ATmega8 and STM8s

Brief description of the working environment: During the time period of my PS-I internship at Melux Control Gears Pvt. Ltd., I gained valuable experience in the electronics industry. The internship focused on two main areas: microcontroller programming and electronic component production and testing. I learned to work with Arduino and STM8S microcontrollers, gaining a strong understanding of their functionalities and applications. In the production department, I operated a copper coil winding machine, ensuring precise parameters and quality standards for line filters and inductor chokes. I also conducted testing on LED strips and LED driver units. The internship enhanced my problem-solving skills, technical knowledge, and documentation abilities. Overall, it provided hands-on experience and equipped me with versatile skills for my future career.

Academic courses relevant to the project: EEE , 2-1 course of phoenix

Learning Outcome: I learnt a lot of about how to optimise production which could never been possible if all my project was in computer work.

**PS-I station: Military College of Electronics and Mechanical Engineering ,
Secunderabad**

Student

Name: VITTAL ORUGANTI .(2021A3PS0778H)

Student Write-up:

PS-I Project Title: Advanced Face Recognition for Campus Attendance System

Short Summary of work done: Worked on testing various algorithms for face detection, face feature extraction, and face recognition to eliminate various problems with the older model. Aforementioned problems include high amount of false positives, problems recognizing unregistered faces as unknown, problems recognizing partially covered faces and unreliability during darker lighting conditions. Worked on making a better model to train their images with. Suggested ways to massively improve their dataset of images to eliminate previous problems. (Images of each person with various facial expressions and some features of their faces covered while in varying lighting conditions will provide optimum conditions for the face recognition model to succeed with the most accuracy.)

Objectives of the project: To register and unregister users through a GUI, To detect and identify faces in a group and mark their respective attendance, To detect unregistered users,

Tool used: VS Code, MTCNN, Numpy, Scikit, ArcFace and RetinaFace (in DeepFace library), KNN via face_recognition_api in Python

Details of Papers/patents:None

Brief description of the working environment: The working environment is a library with enough seats for the 22 interns. The expectations from the company are reflected through the Project-Guides / Mentors we were assigned. We were expected to report any progress and were suggested ways forward every 3 days when we met with our mentor.

Academic courses relevant to the project: CS F111 - Computer Programming

Learning Outcome: Coding and programming using Python; Knowledge of what various algorithms do and how to use them in the multiple steps of a face recognition pipeline; Resourcefulness [ability to learn, adapt and overcome difficulties]

PS-I station: Military College of Electronics and Mechanical Engineering , Secunderabad

Student

Name: PRASANTH VV .(2021A3PS0780H)

Student Write-up:

PS-I Project Title: Advanced face recognition with cap and face covered.

Short Summary of work done: The summer internship project aimed to improve the performance of an automatic university attendance system with face verification and detection for registered students and staff. To enhance accuracy of detection pipeline through advanced facial recognition techniques such as DeepFace, ArcFace, FaceNet. We performed comparative analysis between the existing recognition API and RetinaFace, we saw that the latter outperformed the detection performance both in terms of accuracy and also had alignment feature. For face verification, we replaced the current least distance-based approach with a K-NN based algorithm, adding an 'UNKNOWN' user class. This change significantly improved the accuracy of the pipeline in detecting unregistered staff members with good precision.

Objectives of the project: Users are able to register and unregister through a GUI. Faces are identifiable within at least 6 feet. It can detect faces even when they are partially covered. It can identify unregistered users as UNKNOWN. Identification of faces within a group

Tool used: S/w- python3, open cv, DeepFace(from github)

Details of Papers/patents:None

Brief description of the working environment: We worked in a good environment and had lot of expectations (for work to be done)but could not fulfil due to requiring a lot of things to learn(as it is an ongoing project) which was not possible being electrical students with less to none experience in programming ,we learnt python programming, machine learning, open cv, team work and many more useful skills.

Academic courses relevant to the project: Machine learning

Learning Outcome: Python coding, Machine learning, team work

**PS-I station: Military College of Electronics and Mechanical Engineering ,
Secunderabad**

Student

Name: ARYAN VERMA .(2021A3PS2102H)

Student Write-up:

PS-I Project Title: Identification of Target from Thermal Live Video

Short Summary of work done: We started by learning the basics of machine learning, which provided a strong foundation for understanding advanced concepts. Specifically, we explored Convolutional Neural Networks (CNN), a powerful architecture for image processing and analysis. This knowledge proved essential for diving into the practical implementation of our project. We then delved into the OpenCV library, a widely-used tool in the field of computer vision. OpenCV enabled us to apply various techniques for object detection. To further enhance our object detection capabilities, we ventured into YOLO V8, a state-of-the-art object detection algorithm. Through training and testing a custom dataset, we familiarized ourselves with the YOLO V8 architecture and learned how to fine-tune it for our specific application.

Training a Custom Model: Developed a custom model for human detection in thermal live videos. Curated a dataset of 1500 thermal images to train the model. Leveraged the YOLOv8 architecture for training, known for its speed and accuracy.

Robust Testing and Detection: Rigorously tested the model on diverse test cases beyond humans, including animals and environmental elements. Confirmed that the model effectively detected humans while filtering out false positives. Validated the model's reliability and specialization in real-time human identification.

Real-time Implementation: Planned implementation of a real-time video feed for human detection from live video. Utilizing OpenCV functions for video processing, frame capturing, and pre-processing. Integrating the trained model with OpenCV to overlay bounding boxes on the video feed for instant human identification. Generating alerts on another device Integrated Bluetooth functionality to generate alerts on another device. Displayed the alert message on the paired device's screen. Implemented a notification sound to accompany the alert message.

Objectives of the project: Propose a system that should be capable of identifying human targets from the output of a thermal imager. The system should provide detection in real time by taking real time video feed. The system be capable of working in near dark or low light conditions. The system should be capable of generating alerts which would be delivered on to a mob platform or a smart wearable device.

Tool used: 1.Python 2.OpenCV 3.Deep Learning Frameworks 4.YOLO and YOLOv8 Models 5.Communication APIs

Details of Papers/patents:.

Brief description of the working environment: The environment was very friendly and open to discussions. MCEME being an Army organisation; discipline, dedication and consistency were its core structures, which helped me improve in these fields effectively. The project being related to the real-time application inculcated a sense of responsibility

in me as the project being developed would be further used by our soldiers, so providing an optimal solution was a very important aspect. Finally, it helped me learn new skills and put them to use in such a place which will positively affect society.

Academic courses relevant to the project: Machine Learning

Learning Outcome: 1.Computer Vision and Object Detection 2.Deep Learning and Neural Networks 3.Real-Time Processing 4.Alert Generation and Wearable Integration 5.Project Management and Problem Solving

PS-I station: Military College of Electronics and Mechanical Engineering , Secunderabad

Student

Name: VIPUL S PATIL(2021A3PS2564G)

Student Write-up:

PS-I Project Title: Frequency spot jammer

Short Summary of work done: Research oriented. Going through many research papers, finding something related. Modifying the designs to our requirements and combine all the subsystems into one final working design

Objectives of the project: 1) design a jammer 2) select precise frequency in range 30-90mhz 3) Give power spectrum analysis

Tool used: CPP, Matlab, Simulink

Details of Papers/patents:-

Brief description of the working environment: 8am to 1pm. Mon-Fri. Not very strict as long as you show results. But very organised and structured

Academic courses relevant to the project: Communicatio System, Microelectronics, Signals and Systems

Learning Outcome: Simulink, Communication Systems

**PS-I station: Military College of Electronics and Mechanical Engineering ,
Secunderabad**

Student

Name: C DEVANSH REDDY .(2021A3PS2660P)

Student Write-up:

PS-I Project Title: Target Classification in Radar using Deep Learning

Short Summary of work done: We basically had to detect a target coming in a certain distance using the audio signals taken from a radar. We used CNN model to do so. We trained the model first using the samples provided and then got the predictions based on the type of target and its distance from us. This technique could also have been applied to real time analysis but the time was constricting. In the end, the project was really useful and worthy of my time stipulated and also added a lot of useful technical skills onto my resume.

Objectives of the project: 1)Detailed study of various deep learning techniques such as ANN, CNN, etc and their implementation in radar target classification tech 2)Analyse the audio Doppler signals of various target types i.e, crawling man,group of men, light vehicle, heavy vehicle, and tank 3)To obtain spectrograms from the given audio samples of all target types 4)To select a deep learning technique(ANN/CNN) for auto classification of targets in radar 5)Apply the selected technique to the dataset 6)Train the model using the sample and the techniques to get an acceptable accuracy and try to increase it if possible

Tool used: Visual Studio Code, Google Colab, Python tools

Details of Papers/patents:None

Brief description of the working environment: The working environment was comfortable and welcoming to work. All the work for my project had to be done on the laptop itself, so they didn't have to provide anything. The expectations from this particular PS station were mostly inclined towards discipline, patience and hard work considering their strict timings and code of conduct. The mentors assigned were very knowledgeable

and respectable, and they guided me along the journey. I also learnt a lot of technical skills like Deep learning, machine learning, and related techniques apart from these moral ethics.

Academic courses relevant to the project: Signals & Systems, Machine Learning, Artificial Intelligence

Learning Outcome: Understanding radar systems and their operation.

Grasping the fundamentals of deep learning, including neural networks, CNNs, and RNNs.

Preprocessing radar data for deep learning algorithms (normalization, filtering, etc.).

Extracting meaningful features from radar data (time-frequency analysis, spectrograms, etc.).

Designing and training deep learning models for target classification in radar data.

Evaluating model performance using metrics like accuracy, precision, recall, and F1-score.

Applying transfer learning techniques to leverage pre-trained models for radar target classification.

Optimizing model performance for real-time target classification in radar systems.

Conducting experiments to analyze the effectiveness of different techniques and propose improvements.

Gaining practical experience in deploying deep learning models in real-world radar applications.

PS-I station: Military College of Electronics and Mechanical Engineering , Secunderabad

Student

Name: SARANSH PALIWAL(2021A4PS2616G)

Student Write-up:

PS-I Project Title: Velocity estimation of prominent object in view frame using single camera

Short Summary of work done: The project focused on threat estimation using a single camera over a span of 2 months. Extensive research was conducted to understand

computer vision, object detection, and tracking algorithms. The development environment was set up with Python, OpenCV, and TensorFlow. Video data was preprocessed by extracting frames and applying techniques like resizing and noise reduction. Object detection algorithms such as YOLO and SSD were explored and fine-tuned through transfer learning. Object tracking algorithms were implemented to maintain consistent identification of threats across frames. Optical flow estimation was integrated to provide additional context for threat estimation. The system's performance was evaluated using ground truth data, and parameters were adjusted to improve accuracy. A comprehensive report was prepared, documenting the problem statement, methodology, results, and suggestions for future enhancements. Overall, the project successfully developed a threat estimation system that leverages a single camera, combining object detection, tracking, and optical flow analysis to identify potential threats.

Objectives of the project: To develop a an object detection model to identify objects on Indian roads, such as cars and trucks. To develop a threat detection system such as in self driving cars to assist the driver and provide real time feedback on the velocity and distance of the identified objects in the viewframe

Tool used: Work done was mostly software related as the only hardware that was used was our own laptop and a Raspberry Pi in the end to use a dashcam. No specific software was used as it was mainly python related. YOLOv8 was used to custom train the object detection

Details of Papers/patents:We have written a paper along with our project, but it is yet to be published

Brief description of the working environment: We worked in the AI Lab of MCME. We had to use our own laptops as it was a military research centre and hence we could not use their devices. Project was based on machine learning and optics of a camera. Both were completely new to me as I am student of Mechanical Engineering. Learnt python and various object detection models such as YOLO and OpenCV. Wrote a research paper based on our findings and work done. Understood how an organisation works and got the chance to work on a real time project right from day 1. Overall it was a good experience. Had some difficulty in the project initially as it was hardcore coding and ML based but was able to grasp the concepts later and writing a paper on it was cherry on the top as well.

Academic courses relevant to the project: Machine Learning could be a course related to what we did. I don't have a specific idea as the project was based on CS.

Learning Outcome: Project was based on machine learning and optics of a camera. Both were completely new to me as I am student of Mechanical Engineering. Learnt python and various object detection models such as YOLO and OpenCV. Wrote a research paper based on our findings and work done. Understood how an organisation works and got the chance to work on a real time project right from day 1

**PS-I station: Military College of Electronics and Mechanical Engineering ,
Secunderabad**

Student

Name: ANISH NIMMARAJU .(2021A4PS3071H)

Student Write-up:

PS-I Project Title: Low altitude surveillance tethered drone

Short Summary of work done: Our PS-1 project started with research on tethered drone's and their applications. We familiarized ourselves with the control system architecture, used to control the drone copter. We designed a CAD model of the drone frame that can be 3D printed. We carried out extensive research on different components of a drone, their placement in the drone and also came up with ways of cutting costs. We deeply studied the materials that can be used for the making of the tethered drone. The final step of the project included simulation of the tethered drone in Simulink.

Objectives of the project: To develop a low cost high efficiency ground controlled tethered surveillance drone, capable of flying low altitudes, between 20 to 100m.

Tool used: MATLAB, Creo

Details of Papers/patents:-

Brief description of the working environment: I had a very good experience working with MCEME. We were assigned the projects on the first day itself. We had constant support from our PS mentor, co-guides and all the officials in mceme, whose guidance helped us complete our project successfully. I was able to work efficiently and come out with new ideas for the project. We were given the freedom to work at our own pace. Overall, I gained significant industrial knowledge working as an intern.

Academic courses relevant to the project: Microcontrollers, Mechanisms and Machines

Learning Outcome: I gained knowledge on the functioning of a tethered drone. I improved my presentation and communication skills. I learned to maintain a weekly diary,

and learned to write a project report. PS-1 helped me improve my decision making skills. I also learned how to work efficiently as a team. PS-1 also ensured that I am disciplined, as it involved waking up early to start work.

PS-I station: Military College of Electronics and Mechanical Engineering , Secunderabad

Student

Name: RAMYA SRIDHAR .(2021A8PS1616H)

Student Write-up:

PS-I Project Title: Design of Low altitude surveillance tethered drone

Short Summary of work done: 1. For the first week of PS 1, Research was done of different types of surveillance drones, parts of the drone, its working, aerodynamics and control systems 2. Theoretical calculations of power, weight and flight time of tethered drone and in case of cut off of tether after surveillance work 3. CAD model of hypothetical drone and simulation for tethered control system in Simulink, changing parameters based on calculations for surveillance at 20 and 100 m 4. Made presentation of progress and project scope and planned how to finish deliverables required

Objectives of the project: Development of low cost tethered drone capable of surveillance at 20 and 100 m

Tool used: S/w- Simulink, creo

Details

of

Papers/patents:<https://www.sciencedirect.com/science/article/abs/pii/S000510981630526X> :- paper used for simulation of drone

Brief description of the working environment: Working environment is strict in terms of timings, Half day from 8 to 1:30 pm, attendance must be posted to the station from Monday to Friday, Orientation included a tour of the facilities at Faculty of Electronics, the sub division of MCEME under which we worked in, most of the work is done in the library where guides meet up with teams based on their availability and meetings are scheduled days in advance

Expectations:- Learn how to work and organize specific goals in a team, improving soft skills and experience different areas of robotics projects

Learning:- i) Communication within team

ii) Design and planning of tethered drone with necessary components and parameters according to conditions of surveillance

iii) Conduct and discipline in workplace

iv) Functioning of government organization and setting short term goals to complete scope of project

v) Making Gantt chart and how to assign different responsibilities to team members

Academic courses relevant to the project: Electrical machines

Learning Outcome: Learnt about different types of surveillance drones used in the military, power and weight distribution involved when designing a drone, out-of-box creative thinking on how to manage resources when developing a low cost drone and simulation of its control design

PS-I station: Military College of Electronics and Mechanical Engineering , Secunderabad

Student

Name: PERUMALLA ABHIRAM .(2021A8PS2100H)

Student Write-up:

PS-I Project Title: Target Classification in Radar using Deep Learning

Short Summary of work done: We basically had to detect a target coming in a certain distance using the audio signals taken from a radar. We used CNN model to do so. We trained the model first using the samples provided and then got the predictions based on the type of target and its distance from us. This technique could also have been applied to real time analysis but the time was constricting. In the end, the project was really useful and worthy of my time stipulated and also added a lot of useful technical skills onto my resume.

Objectives of the project: 1)Detailed study of various deep learning techniques such as ANN, CNN, etc and their implementation in radar target classification tech 2)Analyse the audio Doppler signals of various target types i.e, crawling man,group of men, light vehicle, heavy vehicle, and tank 3)To obtain spectrograms from the given audio samples of all target types 4)To select a deep learning technique(ANN/CNN) for auto classification of targets in radar 5)Apply the selected technique to the dataset 6)Train the model using the sample and the techniques to get an acceptable accuracy and try to increase it if possible

Tool used: Visual Studio Code, Google Colab, Python tools

Details of Papers/patents:None

Brief description of the working environment: The working environment was comfortable and welcoming to work. All the work for my project had to be done on the laptop itself, so they didn't have to provide anything. The expectations from this particular PS station were mostly inclined towards discipline, patience and hard work considering their strict timings and code of conduct. The mentors assigned were very knowledgeable and respectable, and they guided me along the journey. I also learnt a lot of technical skills like Deep learning, machine learning, and related techniques apart from these moral ethics.

Academic courses relevant to the project: Signals & Systems, Machine Learning, Artificial Intelligence

Learning Outcome: Understanding radar systems and their operation.

Grasping the fundamentals of deep learning, including neural networks, CNNs, and RNNs.

Preprocessing radar data for deep learning algorithms (normalization, filtering, etc.).

Extracting meaningful features from radar data (time-frequency analysis, spectrograms, etc.).

Designing and training deep learning models for target classification in radar data.

Evaluating model performance using metrics like accuracy, precision, recall, and F1-score.

Applying transfer learning techniques to leverage pre-trained models for radar target classification.

Optimizing model performance for real-time target classification in radar systems.

Conducting experiments to analyze the effectiveness of different techniques and propose improvements.

Gaining practical experience in deploying deep learning models in real-world radar applications.

PS-I station: Military College of Electronics and Mechanical Engineering , Secunderabad

Student

Name: SUCHITRA SAHU .(2021A8PS2210H)

Student Write-up:

PS-I Project Title: Target classification in radar using deep learning

Short Summary of work done: We basically had to detect a target coming in a certain distance using the audio signals taken from a radar. We used CNN model to do so. We trained the model first using the samples provided and then got the predictions based on the type of target and its distance from us. This technique could also have been applied to real time analysis but the time was constricting. In the end, the project was really useful and worthy of my time stipulated and also added a lot of useful technical skills onto my resume.

Objectives of the project: 1)Detailed study of various deep learning techniques such as ANN, CNN, etc and their implementation in radar target classification tech 2)Analyse the audio Doppler signals of various target types i.e, crawling man,group of men, light vehicle, heavy vehicle, and tank 3)To obtain spectrograms from the given audio samples of all target types 4)To select a deep learning technique(ANN/CNN) for auto classification of targets in radar 5)Apply the selected technique to the dataset 6)Train the model using the sample and the techniques to get an acceptable accuracy and try to increase it if possible

Tool used: Visula studio code,Google colab,Python tools

Details of Papers/patents:None

Brief description of the working environment: The working environment was comfortable and welcoming to work. All the work for my project had to be done on the laptop itself so they didn't have to provide anything. The expectations from this particular PS station were mostly inclined towards discipline, patience and hard work considering their strict timings and code of conduct. The mentors assigned were very knowledgeable and respectable and they guided me all the way along the journey. I also learnt a lot of technical skills apart from these moral ethics like Deep learning, machine learning, and related techniques.

Academic courses relevant to the project: Signal Systems, Machine Learning

Learning Outcome: Understanding radar systems and their operation.

Grasping the fundamentals of deep learning, including neural networks, CNNs, and RNNs.

Preprocessing radar data for deep learning algorithms (normalization, filtering, etc.).

Extracting meaningful features from radar data (time-frequency analysis, spectrograms, etc.).

Designing and training deep learning models for target classification in radar data.

Evaluating model performance using metrics like accuracy, precision, recall, and F1-score.

Applying transfer learning techniques to leverage pre-trained models for radar target classification.

Optimizing model performance for real-time target classification in radar systems.

Conducting experiments to analyze the effectiveness of different techniques and propose improvements.

Gaining practical experience in deploying deep learning models in real-world radar applications.

PS-I station: Military College of Electronics and Mechanical Engineering , Secunderabad

Student

Name: KAUSHIK KADIUM .(2021AAPS0543H)

Student Write-up:

PS-I Project Title: Drone mounted jammers

Short Summary of work done: We researched and implemented two major spoofing techniques : frequency spoofing and GPS Spoofing. Our main objective was to mount a jammer on the drone. We researched on every aspect of the project and provided a well structured and detailed plan on how we can implement the mounting of jammer. We found out ways to safeguard the control signals of our drone while the jammer is working and this found a major push in our project. Also we learned a few methods to perform filtering and spoofing on sophisticated drones. We also learned about SDRs. SDRs (Software Defined Radio) are a significant part in jammers .We explored different types of SDRs available in the market and found out the best ones that fit in our project considering the drone's aerodynamics, its payload limit is crucial. We implemented a basic WiFi Jammer using USRP B210 module on the GNU RADIO platform. The USRP Sink module

generates signals at the required frequency. The USRP Source receives the signals at a particular programmed frequency. We built the jammer to operate at two different frequencies. In Conclusion, we learnt about SDRs....exclusively about USRP B210 series and also learned and implemented techniques like Jamming, filtering GPS spoofing and frequency spoofing.

Objectives of the project: Finding ways to mount a jammer on a drone to jam enemy drones.

Tool used: Hardware : USRP N210 Software : GNU Radio

Details of Papers/patents:
None

Brief description of the working environment: The place of work was so soothing and refreshing. We could learn completely new concepts and hopefully fulfilled the expectations of the company. We learned two major spoofing techniques : frequency spoofing and GPS Spoofing. Our main learning outcome was to mount a jammer on the drone. We learned every aspect of the project and provided a well structured and detailed plan on how we can implement the mounting of jammer. We found out ways to safeguard the control signals of our drone while the jammer is working and this found a major push in our project. Also we learned a few methods to perform filtering and spoofing on sophisticated drones. We also learned about SDRs. SDRs (Software Defined Radio) are a significant part in jammers. We explored different types of SDRs available in the market and found out the best ones that fit in our project considering the drone's aerodynamics, its payload limit is crucial. We implemented a basic WiFi Jammer using USRP B210 module on the GNU RADIO platform. The USRP Sink module generates signals at the required frequency. The USRP Source receives the signals at a particular programmed frequency. We built the jammer to operate at two different frequencies. In Conclusion, we learnt about SDRs....exclusively about USRP B210 series and also learned and implemented techniques like Jamming, filtering GPS spoofing and frequency spoofing.

Academic courses relevant to the project: Digital design , microelectronic circuits

Learning Outcome: We learnt about :
GPS Spoofing.
Frequency Spoofing.

PS-I station: Military College of Electronics and Mechanical Engineering , Secunderabad

Student

Name: **KARANAM ABHIRAM .(2021AAPS0743H)**

Student Write-up:

PS-I Project Title: Drone Mounted Radar Jammer

Short Summary of work done: First, we researched about Software Defined Radio. Learnt how to program them to transmit and receive signals. Learnt about GPS Satellites and methods to spoof them. Additionally we learnt about the inner workings of the drone and its remote controller and how to spoof it .

Objectives of the project: 1)Generation of 2.4 GHz and 5 GHz frequency using a Software Defined Radio. 2) Mounting the SDR on a drone keeping in mind it's aerodynamics, load carrying capacity and power supply requirements. 3)Amplifying and transmitting the generated frequency onto the intended target(Airborne/Grounded) 3)GPS Spoofing 5)Frequency Spoofing at 2.4 GHz and 5 GHz.

Tool used: USRP B210 module, GNU Radio, Universal Radio Hacker , GPS-SDR-SIM

Details of Papers/patents:None

Brief description of the working environment: The PS-1 Experience was very pleasant. We clearly informed about our tasks beforehand and were given feedback on how to progress. All of our mentors were very helpful and gave us valuable feedback. The staff helping us procure the hardware were very quick in responding to our requests. Major Learnings from PS-1 apart from technical skills would be effective communication and technical presentation.

Academic courses relevant to the project: Digital Signal Processing , Communication Systems

Learning Outcome: Learnt about Radio Communication ,SDRs ,GPS satellites and spoofing them and frequency spoofing

PS-I station: Military College of Electronics and Mechanical Engineering , Secunderabad

Student

Name: CHINMAYEE P .(2021B4A82327H)

Student Write-up:

PS-I Project Title: NEAR OPTIMAL INDEX CODE ENCODING AND DECODING OF GROUPCAST INDEX CODING PROBLEMS

Short Summary of work done: This project focuses on studying and understanding index coding problems, including their encoding and decoding techniques. It explores various types of index coding problems and their optimal and near optimal solutions. The project also involves the analysis of minrank and side information graphs. The main objective is to design a near optimal encoding and decoding technique specifically for groupcast index coding problems and implement it using Python. The implemented algorithm will be evaluated to assess its performance and effectiveness. Overall, this work aims to contribute to the field of index coding and provide practical solutions for efficient data transmission to multiple receivers with different demands.

Objectives of the project: Study and understand index coding problems, including encoding and decoding techniques. Explore various types of index coding problems and their optimal and near optimal solutions. Analyze minrank and side information graphs. Design a near optimal encoding and decoding technique for groupcast index coding problems. Implement the algorithm using Python for a given index coding problem.

Tool used: Software-Python, IDE, IEEE Papers

Details of Papers/patents:-

Brief description of the working environment: An internship at a military college in India offers a disciplined and structured working environment focused on fostering leadership qualities and professional development. As an intern, you are expected to demonstrate commitment, discipline, and professionalism by adhering to the college's rules, regulations, and code of conduct. The company (college) expects you to maintain a positive learning attitude, actively engage in teamwork and cooperation, and demonstrate adaptability and resilience in dynamic situations. During the internship, you can expect to gain valuable learning experiences such as leadership skills development, military training, exposure to various departments and units, professional development through lectures and workshops, and the opportunity to build a network within the military and defence sector.

Academic courses relevant to the project: Math F243- Graphs and networks

Learning Outcome: This project will provide a comprehensive understanding of index coding problems, encoding and decoding techniques, and optimal solutions. You will gain knowledge of minrank and side information graphs, develop algorithm design skills for groupcast index coding problems, and implement the designed algorithm using Python. Evaluation and analysis of the algorithm's performance will further enhance your critical thinking and assessment abilities. These outcomes will equip you with valuable skills applicable to communication and network optimization scenarios.

PS-I station: National Atmospheric Research Laboratory , Tirupathi

Student

Name: KRUSHI BEZAWADA .(2021A4PS3069H)

Student Write-up:

PS-I Project Title: Characterization of Atmospheric Turbulence

Short Summary of work done: We attended technical classes for the first two weeks and started working on our project. We made MATLAB scripts that take in the given data and give out analyzed results. From those results, we can draw conclusions about Atmospheric Turbulence

Objectives of the project: To Study Atmospheric Turbulence

Tool used: H/w : 3D Ultrasonic Anemometer, S/w : MATLAB

Details of Papers/patents:None

Brief description of the working environment: Our working environment is a Research laboratory. We were expected to make scripts and use them to analyze the given data.

Academic courses relevant to the project: Fluid mechanics

Learning Outcome: Learnt to use MATLAB, better understanding about Turbulence

PS-I station: National Atmospheric Research Laboratory , Tirupathi

Student

Name: AJEYA HEGADE K R.(2021A8PS3197H)

Student Write-up:

PS-I Project Title: HF Radar Signal Processing And Parameter Retrieval

Short Summary of work done: The data received at the HF radar is in the form of a time series signal which is known as the I (in phase signal) component. The phase of the signal will be shifted by 90 degrees to obtain the quadrature(Q). I and Q elements are combined to obtain a complex signal $I+jQ$ which will be Fast Fourier transformed to get $A+jB$ (spectral Signal). The spectral signal data is in the form of a .d2 file which can be accessed and worked upon with the aid of the MATLAB software application. The file contains data which is in the format such that it consecutively consists of headers (each 128 bytes) and the associated spectral data whose size depends upon the specifications attributed to the header. The header consists of all the data characteristics necessary for the data processing procedure such as baud length, NRGB, NFFT, IPP, time etc. The number of data bytes which need to be read at a time is $NRGB \times NFFT$ in the float 32 format. This process of reading the data contained in the header and the associated spectral data needs to be continued until the file ends. The spectral data is arranged into a 3D matrix of $NFFT \times NRGB \times \text{Time}$. This data can be attributed to the data points contained with regard to the NFFTs at each and every range bin corresponding to each timeline. These 3 parameters NRGB (number of range bins) or heights, NFFT data points at each rangebin or height corresponding to each timeline. All these NFFT data points can be added to get the power associated with each range bin corresponding to each timeframe and the power is converted into db (decibels). So concisely we are converting a 3D matrix into a 2D matrix so that we can plot a graph known as the power spectrum (power in decibels) which is a $NRGB \times \text{time}$ matrix. SNR and Power is the calculated.

Objectives of the project: Extracting the signal from HF radar and reading it to obtain fundamental parameters like signal to noise ratio (SNR), Power

Tool used: Matlab

Details of Papers/patents:Journal of Geophysical Research: Space Physics
RESEARCH ARTICLE

10.1002/2014JA020604

Brief description of the working environment: The working environment was professional but very approachable. The research lab expected us to find it difficult to complete our projects as it involved subjects that will be studied in the third year. I learnt about different types of Radars, Lidars and Sodars used in atmospheric monitoring and probing . I also learnt about MATLAB.

Academic courses relevant to the project: Electronics and Communications, Electronics and Instrumentation

Learning Outcome: Analysis of SNR, Power plot and spectral time intensity graph provides information which can be used to characterize the ionosphere. Learning of MATLAB.

PS-I station: National Atmospheric Research Laboratory , Tirupathi

Student

Name: AABIR ROY .(2021AAPS0021P)

Student Write-up:

PS-I Project Title: Interferometry Analysis with HF Radar Observations

Short Summary of work done: Understanding of radar systems, learning of how to process data and draw inferences from them

Objectives of the project: To find the coherence and phase from 5 channel IQ data to study the movement of the target.

Tool used: MATLAB, Electronics, Python

Details of Papers/patents:-

Brief description of the working environment: Relaxed environment. Can work at own pace.

Academic courses relevant to the project: Signals and Systems

Learning Outcome: To understand the cases that interferometry can help us.

PS-I station: National Atmospheric Research Laboratory , Tirupathi

Student

Name: SHIREEN PRASAD(2021AAPS0022G)

Student Write-up:

PS-I Project Title: Signal Processing and Data Analysis on MST Radar

Short Summary of work done: We were tasked to take a binary time series data file and extract the data stored to perform FFT, Incoherent Integration and finally Decluttering techniques on the data to reduce the noise and clutter of the signal received from the MST Radar. This is a vital step as when the signal is being received from any receiver, various clutter such as ground clutter, stationary clutter, moving clutter are also obtained which are irrelevant to the information we wish to obtain - wind velocity and direction, which are found at the very end of the signal processing steps. We have done the starting steps as per how much time we had.

Objectives of the project: To extract the data and perform Fast Fourier Transformation, Incoherent Integration and Decluttering techniques on the signal data obtained

Tool used: MATLAB (S/w)

Details of Papers/patents:1. AIR Development Report, 17 November 2017, Pg 79 - 82, NARL

2. IP. Srinivasulu, P. Yasodha, P. Kamaraj, T. N. Rao, A. Jayaraman, S. N. Reddy, and S.

Satyanarayana, "1280-MHz Active Array Radar Wind Profiler for Lower Atmosphere: System Description and

Brief description of the working environment: Environment was very good. It had good staff and facilities, very good onsite accommodations were available along with mess food. All staff, including Researchers and Assistants were very supportive of us students. They always were ready to answer any of our doubts and teach us any concepts. The researchers well understand our level of knowledge and adjusted the projects they could

assign us so that we could perform to the best of our abilities instead of us not understanding any of the concepts due to their level of research being extremely high and complicated. Overall it was an eye opening experience to the Radar industry.

Academic courses relevant to the project: Mathematics, ECE, EEE, ENI, Computer Science

Learning Outcome: MATLAB, how the radars, lidars and other instruments of NARL operate, how to read the data files provided and perform necessary steps for signal processing

PS-I station: National Atmospheric Research Laboratory , Tirupathi

Student

Name: Pradyut Sood(2021B3A40974P)

Student Write-up:

PS-I Project Title: Dealiasing Radial Wind Velocity Data Obtained from Doppler Weather Radars

Short Summary of work done: We executed a Velocity Azimuth Display based method to dealias wind radial velocity data obtained from Doppler weather radars.

Objectives of the project: To increase the quality of radial wind velocity data obtained from Doppler weather radars, by rejecting faulty data and dealiasing aliased data.

Tool used: Python, Spyder, X-Band Radar

Details of Papers/patents:Nil

Brief description of the working environment: The environment at NARL fostered scientific inquiry and encouraged asking questions. Being the most advanced facility in India for atmospheric research, the laboratory exceeded all expectations.

Academic courses relevant to the project: Nil

Learning Outcome: Reading research papers, understanding radar systems, coding in MATLAB and Python

PS-I station: National Centre for Polar and Ocean Research (NCPOR) Onsite , Goa

Student

Name: ADARSH DAS .(2021A7PS1511H)

Student Write-up:

PS-I Project Title: Development of web based expedition proposal portal and data analysis

Short Summary of work done: This work involves the creation of a website dedicated to proposal submission for NCPOR (National Centre for Polar and Ocean Research). The website incorporates three distinct user roles: proposal submitters, reviewers, and coordinators. The coordinator oversees the process, managing the submission and review of proposals between the other two parties. Additionally, the website offers data analysis capabilities, featuring an interactive view of BC6 (Black Carbon) concentration data. This multifaceted platform streamlines the proposal submission process and provides a valuable tool for data analysis, enhancing the efficiency and effectiveness of research activities within NCPOR.

Objectives of the project: Creating a website for proposal submission and data analysis for NCPOR

Tool used: Django, Python, Pandas

Details of Papers/patents:N/A

Brief description of the working environment: During my work experience, the working environment was incredibly relaxed and comfortable. Each day, I would have a morning discussion with my mentor to plan and outline the tasks I needed to accomplish. Together, we would set clear goals for the day. At the end of the day, we would meet again to review my progress and discuss any challenges or mistakes I encountered.

My mentor played a crucial role in creating a supportive atmosphere. He was always there to guide me, offer assistance, and help me overcome any mistakes I made along the way. His encouragement and understanding made me feel confident and motivated to tackle my tasks.

I was also fortunate to interact with helpful individuals who made the environment even more enjoyable. I met a peer from another institute and a PhD scholar within NCPOR who were both incredibly supportive. On my first day, they took me on an informal tour, which helped ease my nerves and make me feel more comfortable in the new setting.

Throughout the term, we maintained a friendly and collaborative atmosphere. We frequently engaged in discussions about our respective projects, sharing ideas, and seeking feedback from one another. I found that this camaraderie extended to technical aspects as well. For instance, I often shared my data analysis code with them, and in return, they provided valuable insights and assistance to improve the code.

This sense of teamwork and mutual support not only helped me grow professionally but also made the working environment even more welcoming. The combination of a supportive mentor and helpful peers contributed significantly to my positive experience during the work term. I felt like a valued member of the team, and the exchange of knowledge and assistance enhanced our collective productivity and success.

Overall, the working environment was positive and conducive to my learning and growth. The open communication and supportive nature of my mentor made the experience enjoyable and allowed me to excel in my work.

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

Learning Outcome: Was able to learn fullstack web development in django and numerous data mining methods

**PS-I station: National Centre for Polar and Ocean Research (NCPOR)
Onsite , Goa**

Student

Name: VASHISTH CHOUDHARI .(2021A7PS1989H)

Student Write-up:

PS-I Project Title: Weather Data Analytics Using Deep Learning Techniques

Short Summary of work done: My tasks started with learning more about various types of Neural Network architectures and forming a detailed analysis on their pros, cons and use cases. Post the report I started using those models to forecast temperature and tried to find the best working mode. Once that was done I started working on classifying blizzards using air pressure and windspeed data obtained from the Bharati station in the Antarctic. Since we required future data, to be able to predict blizzards by classifying it based on the future data, I created models to forecast Air Pressure and Wind Speed as well. Finally on combining the various models, I obtained a blizzard prediction model.

Objectives of the project: Prediction of Blizzards in the Antarctic region by classifying data obtained on forecasting Temperature, Air Pressure and Wind Speed

Tool used: Python, Keras, Numpy, Pandas, Matplotlib

Details of Papers/patents:NA

Brief description of the working environment: The working environment at the station was quite homely with all the employees in our lab being very helpful and uplifting. My mentor was also quite approachable and was open to helping us and correcting us based on what his and the projects exact requirements were.

This helped me learn how to present the data and results I obtained in a more formal manner, which would be easy to understand for even those who are not very acquainted with the concepts involved.

Although the expectations were quite high as I was expected to learn about multiple courses and fields that we had not yet been taught, and had to be very regular to work, often having to report on holidays. The learning experience was quite worth it.

Academic courses relevant to the project: Machine Learning, Probability and Statistics Courses that I haven't completed yet by should be relevant due to the titles/content: Deep Learning, Neural Networks, Data Mining.

Learning Outcome: Multiple Neural Network Techniques, Analysis of Data and plotting charts

**PS-I station: National Centre for Polar and Ocean Research (NCPOR)
Onsite , Goa**

Student

Name: ROHAN ARORA .(2021B1A31693P)

Student Write-up:

PS-I Project Title: Phenotypic characterization of siderophore-producing bacterial isolates from the Southern Ocean

Short Summary of work done: During my internship, I had the opportunity to work on an intriguing research project titled "Phenotypic characterization of siderophore-producing bacterial isolates from the Southern Ocean." The main objective was to study the bacterial diversity in the Southern Ocean and explore their ability to produce siderophores, which are iron-chelating compounds with potential ecological and biotechnological significance. To achieve this I first isolated pure cultures of bacteria by carrying out discontinuous streaking. Once the colonies were grown they were refrigerated till further use. Then I moved onto determine the unique physical characteristics of bacterial colonies. For this I performed gram staining. Gram-positive bacteria appear purple following Gram staining, while Gram-negative bacteria appear pink or red. Gram staining provides important information about the bacterial cell wall structure, facilitating the preliminary identification and classification of bacterial species. This was followed by determining the various physical colony characteristics like shape, size, margin, elevation by observation. Then various chemical tests like carbohydrate utilisation test and CAS assay were performed. KB009 HiCarbo Kit were used to carry out the biochemical test of carbohydrate utilisation. KB009 is a comprehensive test system that can be used to study the biochemical profile of a wide variety of organisms. The experiments are based on the pH change and substrate utilisation principles. Further the siderophore production by the bacterial isolates was determined with the help of CAS assay. Thus, the findings of my research contribute to a deeper understanding of microbial diversity and ecological interactions in the Southern Ocean. The discovery of novel siderophores may hold potential applications in biotechnology and bioremediation.

Objectives of the project: The main objectives of the projects were to explore various techniques employed for the phenotypic characterization of siderophore-producing bacterial isolates from the Southern Ocean. This involved various steps like growth of pure bacterial strains, gram staining, assessment of physical characteristics, carbohydrate utilization test and CAS assay.

Tool used: Microbiological Techniques: Techniques for isolating, cultivating, and maintaining bacterial strains under controlled laboratory conditions are fundamental. This involves using petri dishes, agar media, and other laboratory equipment. Instruments like aut

Details of Papers/patents:-

Brief description of the working environment: My PS1 on "Phenotypic characterization of siderophore-producing bacterial isolates from the Southern Ocean" offered an enriching and stimulating working environment. NCPOR provided a well-equipped laboratory with cutting-edge technology and experienced mentors like Dr. Bhaskar and Mr. Rantim who guided and supported me throughout the research process. The team's collaborative spirit and open communication created a positive atmosphere where ideas were welcomed and encouraged. Regular discussions further enriched the learning experience.

Expectations from the company were high, with an emphasis on dedication, attention to detail, and a passion for scientific exploration. I was expected to adhere to strict laboratory protocols and maintain accurate records of my experiments. My mentor encouraged me to take ownership of my work, foster creativity, and approach challenges with a problem-solving mindset.

Throughout the PS, I gained valuable skills and knowledge. They became proficient in microbiological techniques, such as bacterial isolation, cultivation, and maintenance. The characterization of siderophore production involved various chemical and molecular biology techniques, providing hands-on experience in advanced analytical tools. Additionally, I learned to analyze and interpret research data critically, enhancing my scientific reasoning abilities. The PS not only deepened my understanding of marine microbiology but also nurtured essential soft skills such as teamwork, scientific writing, and effective communication. Overall, the PS offered a comprehensive learning experience that has prepared me for future endeavors in the field of environmental research and microbiology.

Academic courses relevant to the project: Mostly courses of Msc. Biological Sciences like Microbiology, Instrumental methods of analysis, Bio Project Lab, GET

Learning Outcome: I learned about the unique bacterial diversity particularly siderophore producing bacteria inhabiting the Southern Ocean. I also got to know about methods to measure siderophore production and apply them in our daily life. I performed various new techniques to carry out the characterization of bacterial classification. This includes performing carbohydrate utilization test and CAS assay for the first time.

PS-I station: National Centre for Polar and Ocean Research (NCPOR)
Onsite , Goa

Student

Name: YATHARTH AGARWAL .(2021B1A82299P)

Student Write-up:

PS-I Project Title: Techniques for Phenotypic Characterization of Siderophore - producing Bacterial Isolates from Southern Ocean

Short Summary of work done: This internship project focuses on the phenotypic characterization of bacterial isolates obtained from the Southern Ocean. The project involves the isolation and culturing of bacterial samples collected from various locations in the Southern Ocean. Comprehensive phenotypic characterization will be conducted, including Gram staining, CAS assay, carbohydrate tests, and analysis of colony characteristics such as morphology and motility. The aim is to understand the morphological, physiological, and biochemical properties of the bacterial isolates. The collected data will be analyzed to identify patterns and correlations, providing insights into the ecological implications of the bacterial isolates from the Southern Ocean.

Objectives of the project: Colony characterization of some bacterial isolates, Phenotypic and biochemical characterization - Gram staining, carbohydrate test, Siderophore tests of select isolates

Tool used: Microcentrifuge, Spectrophotometer, Weighing Scale, Laminar Air Flow, Autoclave, Gradient Incubator

Details of Papers/patents:None

Brief description of the working environment: The atmosphere was characterized by a strong sense of camaraderie and cooperation, as the people I interacted with were friendly, supportive, and approachable. This created a comfortable working environment where I felt encouraged to ask questions, seek guidance, and collaborate with my colleagues.

The company's expectations for the internship were focused primarily on learning and personal growth. Rather than placing heavy emphasis on specific deliverables or predetermined outcomes, the company provided me with the freedom to explore and experiment with new ideas. This approach allowed me to challenge myself, think critically, and take ownership of my projects. I was encouraged to step out of my comfort zone, tackle unfamiliar tasks, and develop innovative solutions. The company fostered an environment where failure was viewed as an opportunity for growth and learning.

I had numerous opportunities to acquire new knowledge and develop essential skills. I gained hands-on experience with various laboratory techniques, learned how to analyze and interpret data, and honed my problem-solving abilities. Moreover, working alongside experienced professionals allowed me to observe their expertise and learn from their insights. Their guidance and mentorship played a vital role in my professional development.

Overall, my PS-I experience provided me with a supportive and engaging environment where I could freely explore, learn, and contribute. It has been an incredibly enriching experience, both personally and professionally, as it has equipped me with the skills, knowledge, and confidence necessary for future endeavors in the field.

Academic courses relevant to the project: Microbiology, Genetic Engineering Techniques

Learning Outcome: Skill Development, Data Analysis, Biological Laboratory Techniques

**PS-I station: National Centre for Polar and Ocean Research (NCPOR)
Onsite , Goa**

Student

Name: MUNISH JAIN .(2021B2A31717P)

Student Write-up:

PS-I Project Title: Extraction of carbohydrates from algae

Short Summary of work done: Saccharina latissima algae was used

Objectives of the project: Extraction of carbohydrates from saccharina latissima

Tool used: Hpaec And Pad

Details of Papers/patents:No

Brief description of the working environment: The working environment was very well and the scientists were very helpful

Academic courses relevant to the project: Courses relevant to chemistry subject

Learning Outcome: Analysis of graphs

PS-I station: National Centre for Polar and Ocean Research (NCPOR)
Onsite , Goa

Student

Name: BHARGAV NUTALAPATI .(2021B3AA0815H)

Student Write-up:

PS-I Project Title: weather analysis, visualization and Temperature prediction

Short Summary of work done: My work can be divided into two parts, the first is plotting a few polar plots of wind direction, wind speed and temperature, and a few other graphs using R (This could get as boring as it could get). the second part is prediction of temperature and classification of a few weather parameters using deep learning algorithms in python.

Objectives of the project: To predict temperature using different machine learning models and vizualization of data using R

Tool used: R studio, Jupiter notebook, VS code.

Details of Papers/patents:none

Brief description of the working environment: work environment is lite, you get to stay on campus, and they provide bus service in morning and in the evening the bus stops at Vasco from where you can get a public bus. As for what they expect, they will expect for you learn something contribute to the project. Most of the work they give us isn't that tough it's doable easily.

Academic courses relevant to the project: ECON F213, ECON F241, BITS F464

Learning Outcome: I learnt a few deep learning algorithms and about openair package in R.

**PS-I station: National Centre for Polar and Ocean Research (NCPOR)
Onsite , Goa**

Student

Name: ANANTSHREE PANDEY .(2021B4A71582P)

Student Write-up:

PS-I Project Title: Remote sensing of sea ice in seas around Antarctica

Short Summary of work done: Wrote a paper that outlined the analysis of Sea Ice over 40 years in seas around Antarctica. Used Global Indices like SAM, IOD, ENSO and also used local wind, heat data to find the correlations between these factors and the sea ice.

Objectives of the project: To calculate the sea ice in different seas around Antarctica, then correlate them with various factors

Tool used: Excel, Python

Details of Papers/patents:Not available as of now

Brief description of the working environment: NCPOR is a small beautiful campus located at the coast of Goa. The environment is really nice and in general the working environment is helpful. It is definitely not as premier as other more significant labs in India. It is however, the only institute in India conducting Polar research and expeditions, so is therefore very good at that niche.

Academic courses relevant to the project: Probability & Statistics, Computer Programming

Learning Outcome: Learnt how to properly handle large data, use python for various operations, used excel. Learnt a lot about Antarctica and Sea Ice. Learnt how to write a research paper.

PS-I station: National Centre for Polar and Ocean Research (NCPOR) Onsite , Goa

Student

Name: SATYA GUDURU .(2021B4A82503H)

Student Write-up:

PS-I Project Title: Remote Sensing in Antarctica

Short Summary of work done: We extracted data sets of the sea ice extent of Antarctic regions over the years 1980-2022 and analysed the variability of this extent over the years. Further analysis was done after dividing the Antarctic sea ice regions into 12 major seas and analysing the monthly as well as seasonal trends in the variability for each sea. These trends in the sea ice variability were correlated with four local climate factor indices (temperature, northerly wind, easterly wind, net surface heat) as well as four global climatic event indices (El-Nino Southern Oscillation, Indian Ocean Dipole, Southern Annular Mode, Interdecadal Pacific Oscillation). Results obtained showed a high correlation between these climatic events and factors and the variability of sea ice, as well as the consequent effect that increased/decreased sea ice levels had on the global energy balance.

Objectives of the project: Observing sea ice trends in different Antarctic seas/regions

Tool used: Coding in Python, Matlab

Details of Papers/patents: Paper regarding trends in sea ice extent in different Antarctic regions and the correlation to different climatic events, both global and local.

Brief description of the working environment: We received sufficient support and guidance from our professor guide at NCPOR, Dr Luis, as well as our faculty, Apurba Sir. The research we ended up doing during PS was well along the lines of what we expected to do once we were informed of the details of our project, and developing the skills while doing the same was highly rewarding.

Academic courses relevant to the project: CS F111, MATH F420

Learning Outcome: Data analysis, statistics, computer programming

**PS-I station: National Centre for Polar and Ocean Research (NCPOR)
Onsite , Goa**

Student

Name: PURU GUPTA .(2021B5A71748P)

Student Write-up:

PS-I Project Title: Remote sensing of sea ice in seas around Antarctica

Short Summary of work done: Wrote a paper that outlined the analysis of Sea Ice over 40 years in seas around Antarctica. Used Global Indices like SAM, IOD, ENSO and also used local wind, heat data to find the correlations between these factors and the sea ice.

Objectives of the project: To calculate the sea ice in different seas around Antarctica, then correlate them with various factors

Tool used: Excel, Python

Details of Papers/patents:Not available as of now

Brief description of the working environment: NCPOR is a small beautiful campus located at the coast of Goa. The environment is really nice and in general the working environment is helpful. It is definitely not as premier as other more significant labs in India. It is however, the only institute in India conducting Polar research and expeditions, so is therefore very good at that niche.

Academic courses relevant to the project: Probability & Statistics, Computer Programming

Learning Outcome: Learnt how to properly handle large data, use python for various operations, used excel. Learnt a lot about Antarctica and Sea Ice. Learnt how to write a research paper.

PS-I station: National Institute of Oceanography , Goa

Student

Name: ARKYA ADITYA .(2021A8PS0276P)

Student Write-up:

PS-I Project Title: Build a Custom Linux Image for custom hardware using Yocto

Short Summary of work done: The decision to enroll in the PS1 course at the prestigious National Institute of Oceanography in Goa was one of the best I've ever made. This course allowed me to work on a project involving the customization of a Linux Image for the popular Raspberrypi 4 using the Yocto framework. In addition to the undertaking, my stay in Goa shaped my professional and personal life in numerous ways. Networking has enabled me to connect with individuals who share my enthusiasm for the subject. Developing meaningful relationships with professionals in one's field is an opportunity that can significantly contribute to one's personal and professional development. In terms of potential collaborations, employment opportunities, and mentorship, a person's network of contacts can be extremely beneficial. Throughout the PS1 course, keeping a diary allowed me to monitor my progress, record my reflections, and document significant events. The diary served as a personal archive of accomplishments, obstacles, and breakthroughs. I anticipated gaining practical experience, exposure to industry professionals, and personal development from the PS1 course. The course exceeded these expectations by providing hands-on instruction, refining technical skills, and cultivating communication, adaptability, and subject matter expertise. After obtaining PS Faculty and adviser comments at NIO, I was able to evaluate my performance and identify areas for improvement. This comments helped me grow professionally and achieve my goals. I learned to communicate and listen patiently. Effective communication, adaptability, and time management were also invaluable. I learned the value of teamwork by working with others. The Practice School course showed how research may solve social problems. It made me appreciate NIO's role in oceanographic research. PS1 taught me perseverance and discipline. Perseverance helped me overcome my weaknesses and improve personally and professionally.

Objectives of the project: To develop a minimal image for Raspberry Pi and Reduce it's boot time

Tool used: H/w: Raspberry Pi 4 and GoPro Hero 4 Camera, S/w: Yocto Project, Python and C++

Details of Papers/patents:No patents or papers published

Brief description of the working environment: Working Environment:
Open communication and collaboration: Researchers feel safe discussing their ideas, even if they're unformed. They can also obtain peer input without judgment.

Colleagues and supervisors support: I feel like a team pursuing a goal.

Availability of Research resources through Funding, facilities, and equipment.

A constant strive for perfection: People here strive to better research and generate new discoveries.

Expectation: Before joining NIO, I anticipated learning about the organization and its contributions to society. I was looking forward to learning about various oceanographic instruments and their engineering. I anticipated studying oceanography as a subject. The NIO experience has exceeded my expectations. I was unfamiliar with oceanography and had limited experience in the scientific workplace. However, after completing PS-1, I have grown as an individual, met my expectations, and gained knowledge that will be useful to me in my future career.

Learning Outcomes: I learned a lot as a research intern. This comprised technical expertise, problem-solving, communication, teamwork, professionalism, and career advancement. I explored several research fields, met other researchers, and grew personally and professionally during my internship.

My internship taught me my field's research methods and procedures. Real-world research challenges tested and improved my problem-solving skills. By presenting my research findings, I improved my communication skills and learnt how to interact with interns, students, and researchers on research projects. I developed professionalism in a professional research setting, which is crucial for my career. This internship gave me vital experience for my future.

My research institute internship was enriching. I got to learn, explore, and network with other scholars. I was introduced to research which opened doors to a great career.

Academic courses relevant to the project: Embedded Systems, IoT

Learning Outcome: 1. Learnt about a new software, Yocto Project

2. Learned about National Institute of Oceanography, Goa's contributions to oceanography and society.

3. Learnt about various underwater technologies and contributed in building on of them

4. Learned skills such as group discussion facilitation, seminar presentation, and professional diary writing.

5. Learnt about Broadcasting, AUVs, Underwater Image Processing, Hydrophones apart from the project given to me

PS-I station: National Institute of Oceanography , Goa

Student

Name: SHOBHIT SHARMA .(2021AAPS0525H)

Student Write-up:

PS-I Project Title: Wave Breaking studies using Hydrophone Array

Short Summary of work done: The project involved designing of hydrophone array using MATLAB's Phased Array Toolbox. The Phased Array Toolbox provides various functions and methods for simulating the behaviour of the phased array antennas. Next part was to give a signal to the hydrophone, simulate the receiving part and apply beamforming techniques. Here we applied two beamforming algorithms, a conventional one known by the name of Phase Shift beamforming, and an adaptive beamforming technique known as MVDR beamforming. It was demonstrated that MVDR Beamforming effectively suppresses interference and enhances the desired signal compared to conventional beamforming. The directivity patterns and signal plots show the ability of MVDR to steer the beam towards the desired signal direction while nullifying interference from other angles. The Phase Shift Beamforming was not able to suppress the interference but gave exact same results for signals without interferences with the added advantage of being computationally lighter than MVDR beamforming. We also studied the effects of variation of element spacing and number of elements on directivity. Increasing any parameter makes the beam more directed but at the cost of increasing number of side and grating lobes. Apart from this project we were given a first-hand experience on the working of the research based industry. We maintained formal diary to keep track of our progress and milestones regularly conducted group discussions and presented seminars on the various aspects of National Institute of Oceanography, Goa.

Objectives of the project: To design a hydrophone array and evaluate its performance. Apply conventional beamforming technique, Phase Shift Beamforming and MVDR beamforming and evaluate the performance by Vary the number of elements and element spacing and check the effect on the directivity of the hydrophone array.

Tool used: MATLAB, Simulink, Phased Array Toolbox

Details of Papers/patents:Nil

Brief description of the working environment: The National Institute of Oceanography (NIO), Goa provided a flexible and engaging working environment. The learning atmosphere was filled with curiosity and inquisitiveness, as I interacted with fellow interns, project associates, and scientists (Sh. Pramod Maurya and Sh. Mascarenhas Antonio) from across India. The exposure to real-world projects, collaborations, and professional research ethics enriched my experience.

NIO surpassed my expectations in bridging the gap between theory and practical applications. Applying my engineering knowledge to my project broadened my perspective and emphasized the importance of campus education. I expected to gain practical experience, exposure to industry professionals, and personal growth, and the

course exceeded these expectations. It provided hands-on learning, refined my technical skills, and fostered communication, adaptability, and domain knowledge.

Maintaining a diary throughout the course allowed me to track my progress, record reflections, and capture significant events. The diary became a personal repository of milestones, challenges, and breakthroughs.

Memorable experiences like designing the hydrophone array, witnessing AUV testing (with interns Jasjappan Singh and Santosh) , and participating in group discussions about NIO broadened my understanding of PS1 and the institution. Communicating with interns, project associates, and scientists from various departments inspired me and exposed me to diverse ongoing projects at NIO.

In conclusion, the PS1 course was a transformative journey, aligning theory with practice, exceeding expectations, and providing valuable experiences. I am grateful for the opportunities, personal growth, and knowledge gained, as it has shaped my aspirations and prepared me for a future career in Electronics and Communication Engineering.

Academic courses relevant to the project: Signals and Systems, Microelectronic Circuits, Electrical Devices, Technical Report Writing, Computer Programming, Electrical Sciences, Control Systems, Microprocessor and Interfacing.

Learning Outcome: Following are my major learning outcomes:-

Ways to conduct an effective group discussion.

How to write a formal Diary Entry

To form connections with various members of the organization.

Technique to write an effective Report.

Strategy for giving a great presentation.

Simulation in MATLAB and phased array toolbox.

Various aspects of testing and trial runs of Automatic Underwater Robotic Vehicles.

PS-I station: National Institute of Oceanography , Goa

Student

Name: AKSHAT ATUL TUBKI(2021AAPS1985G)

Student Write-up:

PS-I Project Title: Underwater image enhancement techniques

Short Summary of work done: Underwater image enhancement is a crucial field of research aimed at improving the quality and visibility of images captured in aquatic environments. Underwater imaging poses unique challenges, such as light attenuation, color distortion, and scattering, which degrade image quality. Several techniques have been developed to address these issues and enhance underwater images for various applications like marine biology, oceanography, underwater robotics, and recreational diving

Objectives of the project: Underwater image enhancement

Tool used: Python Programming Language along with its editor

Details of Papers/patents:None

Brief description of the working environment: During my PS course, I gained several valuable takeaways that have contributed to my professional growth. Firstly, the hands-on experience was invaluable. I had the opportunity to apply the theoretical knowledge gained in the classroom to practical scenarios, allowing me to understand the real-world implications of my field of study. I worked on various tasks and projects, which enhanced my skills and provided me with a deeper understanding of the subject matter.

Secondly, networking played a significant role in my PS course experience. I had the chance to connect with professionals in my field and build meaningful relationships. These contacts may prove beneficial for future collaborations, job opportunities, and mentorship.

Furthermore, my PS course exposed me to industry insights. I learned about the dynamics and processes within the field, gaining a comprehensive understanding of how the industry operates. I was able to identify current challenges and opportunities, which broadened my perspective and equipped me with valuable knowledge for my future career.

Skill development was another crucial aspect of my PS course. I acquired and honed both technical and soft skills, such as research methodologies, data analysis, critical thinking, and communication..

Moreover, my PS course facilitated personal growth. Through engaging with complex concepts, conducting research, and presenting my findings, I developed intellectual curiosity, analytical thinking, and effective communication skills

Lastly, receiving feedback and evaluations allowed me to gauge my performance and identify areas for improvement.

Academic courses relevant to the project: Machine Learning ,Python Programming

Learning Outcome: Machine Learning ,Computer Vision

PS-I station: Odisha Power Generation Corporation (OPGC) , Jharsuguda

Student

Name: SIDDHI BINAYAK MUDULI .(2021A3PS2941H)

Student Write-up:

PS-I Project Title: Overhaul Preparedness Index

Short Summary of work done: We were given a detailed understanding of the Overhauling Process and the various processes that take place in each step. After that we were required to calculate the OPI score of each department and analyse it graphically where it is majorly lacking.

Objectives of the project: Calculating department wise OPI score

Tool used: Excel, Google Sheets

Details of Papers/patents:None

Brief description of the working environment: Working environment is quite good. In the first week there was an orientation program where engineers of each department showed presentations regarding their work in the Power Plant. In the next week we were given our respective projects and did the plant visits for every department and how they function.

In the subsequent weeks our mentor explained us the Overhauling Process and gave us assignments. The company might expect you to know app development and web development.

Academic courses relevant to the project: Thermodynamics, Electrical Machines.

Learning Outcome: Understanding how the management system works in Thermal Power Plants.

PS-I station: Odisha Power Generation Corporation (OPGC) , Jharsuguda

Student

Name: MATHEW THOMAS .(2021A8PS2955H)

Student Write-up:

PS-I Project Title: Rake Movement Analytics

Short Summary of work done: During my PS-I (Practical Summer Internship), I had the opportunity to work in the MGR (Merry Go Round) system, a private railway system. The internship started with a short trip to familiarize ourselves with the facility's layout and operations. It was an essential part of understanding how the MGR system worked and the complexities involved. Throughout the internship, I focused on gaining a comprehensive understanding of railways, including their systems, networks, and signaling mechanisms. This involved studying the signaling panel and relays, which play crucial roles in ensuring safe and efficient train movements. A significant part of my work during the internship involved conducting a turnaround time analysis. I used MATLAB and Excel for data analysis to draw conclusions on the rake movements. This analysis helped identify patterns and areas for improvement in the train movements within the MGR system. By optimizing the turnaround time, we could increase the system's efficiency and productivity. Used different graphs to draw conclusions and give an overall analysis on current inefficiencies in the system.

Objectives of the project: to analyse one month data on movements of rake (which bring coal) from mines to plant - turnaround time analysis

Tool used: Excel, MATLAB

Details of Papers/patents:None

Brief description of the working environment: The internship offers a fantastic and cooperative working environment, fostering a cool and easy-going atmosphere that encourages personal and professional growth. The company holds high expectations from interns, promoting a hands-on approach to learning and active participation in projects.

During the internship, you can expect to gain valuable practical experience, as the company places a strong emphasis on skill development and knowledge enhancement. The supportive team and mentors readily offer guidance, making the learning process helpful and engaging. Collaboration and open communication are highly encouraged, ensuring a rich and rewarding experience for interns.

The accommodation provided is of good, ensuring a comfortable stay throughout the internship. Although situated a little far from the city, the location offers a serene and peaceful ambiance, ideal for focused learning and personal reflection, food is average not many options but good enough.

Moreover, all basic amenities and facilities are readily available, ensuring a smooth and enjoyable stay. From well-equipped workspaces to recreational areas, the company prioritizes interns' needs, creating an environment that balances productivity and well-being.

Overall, this internship offers a unique opportunity to grow both professionally and personally in a supportive and friendly environment, with a focus on practical learning and development. The combination of an enriching experience, cooperative culture, and comfortable accommodation makes this internship an excellent choice for aspiring professionals seeking a rewarding and unforgettable journey

Academic courses relevant to the project: C, Excel, MATLAB; not many academic course

Learning Outcome: how does an company works, corporate culture, govt or large core companies, data analysis

PS-I station: Odisha Power Generation Corporation (OPGC) , Jharsuguda

Student

Name: PRIYANSH MANTRI .(2021AAPS2046H)

Student Write-up:

PS-I Project Title: Rake Movement Analysis

Short Summary of work done: During my PS-I (Practical Summer Internship), I had the opportunity to work in the MGR (Merry Go Round) system, a private railway system. The internship started with a short trip to familiarize ourselves with the facility's layout and operations. It was an essential part of understanding how the MGR system worked and the complexities involved. Throughout the internship, I focused on gaining a comprehensive understanding of railways, including their systems, networks, and signaling mechanisms. This involved studying the signaling panel and relays, which play crucial roles in ensuring safe and efficient train movements. A significant part of my work during the internship involved conducting a turnaround time analysis. I used MATLAB and Excel for data analysis to draw conclusions on the rake movements. This analysis helped identify patterns and areas for improvement in the train movements within the MGR system. By optimizing the turnaround time, we could increase the system's efficiency and

productivity Used different graphs to draw conclusions and give an overall analysis on current inefficiencies in the system.

Objectives of the project: to analyse one month data on movements of rake (which bring coal) from mines to plant - turnaround time analysis

Tool used: Excel, MATLAB

Details of Papers/patents:None

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Academic courses relevant to the project: C, Excel, MATLAB; not many academic course

Learning Outcome: how does an company works, corporate culture, govt or large core companies, data analysis

PS-I station: Odisha Power Generation Corporation (OPGC) , Jharsuguda

Student

Name: STITI SAMBHAB DAS .(2021B4AA0770P)

Student Write-up:

PS-I Project Title: Generation Projection and Performance Analysis

Short Summary of work done: Using the information on Scheduled Generation, Export Generation, Frequency, ECR Rate, DAM, and RTM, the logic has been programmed to determine the profit/loss in accordance with the new laws. To better visualize DSM data, an interactive dashboard has been built in Microsoft Excel. The creation of new tags to maintain a record of the maximum temperature of each different component of the boiler, heaters and condensers in PI AF. The creation of eight alerts that monitor more than 450 tags and send alerts if they exceed their limit in PI Alerts. In PI Vision, 450 tags were linked in order to provide real-time monitoring of the boiler temperatures and maximal temperature at all times. All the Critical Parameters and controllable loss parameters are linked in two different windows respectively for easy overview. Real-time monitoring 2-D model of the milling system and HP heater has been made. A home page is created where all the displays are accessible using hyperlinks. This new company implementation made it simpler for relevant authorities to work accordingly.

Objectives of the project: DSM Report, PI System

Tool used: S/w - PI System, Power BI, MS Excel

Details of Papers/patents: NA

Brief description of the working environment: The company promotes an open-door policy where employees feel comfortable expressing their ideas, concerns, and feedback to managers and colleagues. Effective communication is encouraged across all levels of the organisation. Flexible work hours, remote work options, and adequate time off contribute to a healthy balance between professional and personal lives. Employee contributions are recognised and rewarded. The company fosters an environment of mutual respect where ethical behaviour and integrity are upheld at all times.

Software Skills: I have acquired proficient skills in advanced-level Microsoft Excel, Power BI, and PI Vision software. I have developed a strong command over these tools through dedicated learning and practise, enabling me to effectively manipulate data, create insightful visualisations, and extract meaningful insights for data-driven decision-making purposes.

Domain knowledge: I have developed domain expertise in the specific area or industry the analytics project focuses on. This knowledge allows me to interpret data in a meaningful context and make more informed decisions or recommendations based on the insights derived from the analysis.

Problem-solving skills: Analytics projects often involve solving complex problems or addressing specific business challenges. This experience enhanced my problem-solving skills by breaking down complex problems into manageable components, formulating hypotheses, designing experiments, and evaluating solutions based on data-driven evidence.

Importance of real-time monitoring: Working on generation projection and performance analytics emphasizes the significance of real-time monitoring of power plant operations. Monitoring critical parameters and performance metrics enables me to prompt the identification of deviations, abnormal conditions, or potential equipment failures, allowing for timely corrective actions.

Academic courses relevant to the project: Probability and Statistics

Learning Outcome: Software Skills, Domain Knowledge, Importance of real-time monitoring, and problem-solving skills

PS-I station: P2F Semi Pvt Ltd. - Web Application Development , Bengaluru

Student

Name: PRANETA MAHAWAR.(2021A4PS1432P)

Student Write-up:

PS-I Project Title: Embedded Systems with Computer Vision and Raspberry Pi

Short Summary of work done: We wrote codes for performing different applications like making a QR Code scanner, vehicle detection, License Plate reader, Gaussian operations on images etc.

Objectives of the project: To have a working camera module with a set of pre-decided deliverables

Tool used: Python, OpenCV, Raspberry Pi, Arduino, ESP32

Details of Papers/patents:None

Brief description of the working environment: We were working at a co-working space that accommodated several other startups, which was a unique experience on its own. We had major learning on mainly how a company works and its functioning, how teams work together to get the most complex of tasks done.

Academic courses relevant to the project: Autonomous Mobile Robotics

Learning Outcome: Computer Vision, Raspberry Pi, ESP32 Cam

**PS-I station: P2F Semi Pvt Ltd. - Web Application Development ,
Bengaluru**

Student

Name: AKASH THONSE SHETTY(2021A7PS1457G)

Student Write-up:

PS-I Project Title: Web Development

Short Summary of work done: In this comprehensive web application project, I successfully learned and implemented the MERN stack (MongoDB, Express.js, React.js, and Node.js). The primary objective was to create a simple CRUD Todo List with user authentication and logging features using log4js. We began by understanding and integrating MongoDB, Express.js, React.js, and Node.js to build a full-stack web application. The Todo List allowed users to create, read, update, and delete tasks through a React.js interface, while Express.js provided RESTful APIs to handle backend operations. Integrating log4js enabled us to implement a logging system to track user activities, system events, and errors, contributing to better application monitoring and issue detection. Implementing user authentication was essential to secure the application and offer personalized Todo Lists to authorized users. We addressed challenges related to data privacy, vulnerabilities, and session management. Additionally, we focused on handling edge cases, ensuring the application's stability and reliability, and creating a

seamless user experience. Throughout the project, we encountered and overcame challenges, such as the log4js library integration on the client side, demonstrating adaptability and problem-solving skills. Overall, this project provided valuable learning experiences, showcasing our proficiency in the MERN stack and the successful implementation of user authentication and logging features. The project lays the foundation for future enhancements and deployment considerations on cloud platforms.

Objectives of the project: The primary objective of the project is to create a highly intuitive and user-friendly Todo List App that allows users to easily manage their tasks and boost productivity. The application should have a modern and responsive interface, making it accessible across various devices

Tool used: MongoDB, Express, React JS, Node JS, log4js, Bcrypt, Git, Visual Studio Code, Postman

Details of Papers/patents: Nil

Brief description of the working environment: The working environment during the internship was a very collaborative and supportive atmosphere. Regular team meetings and discussions provided an opportunity to gain insights into the ongoing projects, understand the company's culture, and align efforts with the overall objectives of the organization. The company had clear expectations from us, including being proactive and displaying a strong eagerness to learn and explore new areas. They valued the importance of seeking help when needed. The internship focused on the MERN stack, offering opportunities to gain hands-on experience with MongoDB, Express.js, React.js, and Node.js, which deepened the understanding of full-stack web development. Integrating log4js for logging features and implementing user authentication enhanced knowledge of application security and monitoring.

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

Learning Outcome: MERN Stack Proficiency, Secure User Authentication, Data Filtering and Manipulation, Comprehensive Logging and Monitoring, Project Management and Delivery

PS-I station: Prama Instruments Pvt. Ltd , Navi mumbai

Student

Name: VYOM VYAS .(2021B4A33146H)

Student Write-up:

PS-I Project Title: Weather monitoring station

Short Summary of work done: We created a weather monitoring station and integrated a web dashboard where all the data could be displayed

Objectives of the project: To learn how to integrate sensors with an esp-32 and get comfortable using the Arduino ide

Tool used: Esp-32,lorawan,Arduino idea,easy eda

Details of Papers/patents:-

Brief description of the working environment: It was a good experience overall.got to interact with a lot of people.

Academic courses relevant to the project: -

Learning Outcome: Soldering
Arduino ide
Easy-EDA
Reading sensor data sheets
Web dashboard

PS-I station: Semi- conductor laboratoty , Mohali

Student

Name: ANSH BHARAT WAIKAR(2021AAPS0634P)

Student Write-up:

PS-I Project Title: Electrical Characterization of GaAs based heterojunction solar cells.

Short Summary of work done: I was tasked with measuring IV and CV-f characteristics of heterojunction solar cells. We obtained the plots for cryogenic temperatures (~80K) up to room temperature by using LN2-based cryostats. The characteristics obtained were further analysed and various parameters such as the contact resistance, activation energies from the dark-IV reverse saturation currents, background doping concentration of the junction, shunt and series resistance of the cell, etc. At the end, we were able to construct a full two-diode model of the solar cell using fitting techniques. We also compared the barrier heights offered by different BSF layers such as AlGaAs and InGaP through the use of TCAD simulations. The project involved frequent trips to the clean-room fab as well as packaging and testing labs. I was able to use state-of-the-art equipment like high precision parameter analysers, sophisticated cryostats, SMUs and more.

Objectives of the project: To obtain temperature dependent IV and CV characteristics of GaAs based heterojunction solar cells, as well as frequency dependent CV-T characteristics for a temperature range of 80K to 300K, then finding various parameters to gauge and validate the fabrication process.

Tool used: We used Silvaco TCAD for simulations, and OriginPro for data analysis.

Details of Papers/patents: Cannot Disclose Details to General Public.

Brief description of the working environment: Working hours were 9-5 with three breaks. I was allotted the Compound-semiconductor Electro-Optical Division (CEOD) under the Electro-Optical Process Group (EOPG). The industry mentor was very knowledgeable and easy to approach and discuss ideas. Other members of CEOD were very helpful and provided invaluable feedback/recommendations. There are various other groups working on a broad range of semiconductor devices like MEMS, Analog/Digital VLSI ICs, as well as groups working on CMOS Fabrication, Testing, Packaging, etc.

Academic courses relevant to the project: Primarily required an understanding of Electronic Devices, as well as basics of electrical sciences. A strong background in microelectronic circuits helps in the understanding of the working of various equipment like the B1500A parameter analyser, SMUs, e

Learning Outcome: Was able to obtain a thorough understanding of the device physics of compound semiconductors such as p-n and heterojunctions and the temperature dependence of various parameters such as doping concentrations, activation energies, etc.

PS-I station: Semi- conductor laboratoty , Mohali

Student

Name: PRANJAL DWIVEDI .(2021AAPS1604P)

Student Write-up:

PS-I Project Title: Comprehensive study of CCD detectors and characterization and analysis of PI7700

Short Summary of work done: They provide me with some resources namely a book named 'Scientific Charge Coupled Device' by Janesick , a book on CMOS by Plummer and a European Space Agency paper on CCD detectors. They make me get through the theory portion of CCD and understand basic working before going to lab. After that I tested silicon wafer for its different characteristics under different wavelengths in a prober. They also arranged a fabrication facility visit in which they explained all the steps involved in fabrication of silicon wafer.

Objectives of the project: To evaluate major performance parameters of CCD detectors

Tool used: Hardware and Software

Details of Papers/patents:No

Brief description of the working environment: The working environment is very helpful and enthusiastic. The institute expects you to observe the tests and help them in their ongoing projects. We learn a lot of things from the mentors and the mentors are very helpful.

Academic courses relevant to the project: Microelectronic Circuit, Electronic Devices and ADVD

Learning Outcome: We obtained image of silicon under different wavelengths and also photon transfer curve and Quantum Efficiency.

PS-I station: Siemens , Aurangabad

Student

Name: DHRUV PARASHAR(2021A3PS2233G)

Student Write-up:

PS-I Project Title: Analysis & Optimization of data collected by the maintenance department.

Short Summary of work done: Work was mostly related to creating interactive dashboards on Power BI. Also, spent some time on the shop floor. Mostly, the learnings were by meeting and seeing people work and solve real world problems.

Objectives of the project: Predicting errors before they crop up so as to minimize losses. Increasing transparency and accessibility of data for everyone, right from the top management to blue collar workers.

Tool used: POWER BI, MS EXCEL

Details of Papers/patents:-

Brief description of the working environment: People are really supportive. One can learn a lot of stuff here. Learning People skills is vrtly important in my opinion.

Academic courses relevant to the project: -

Learning Outcome: Learnt power BI
Learnt excel
Learnt how the business works in a factory

PS-I station: Siemens , Aurangabad

Student

Name: VARAD GORANTYAL .(2021A4PS1995H)

Student Write-up:

PS-I Project Title: Seamless Non-Conformance Monitoring: Enhancing Factory Performance with Power BI and Excel

Short Summary of work done: Made an interactive dashboard on Microsoft Power BI and using the data in Microsoft Excel for representing the data of the non-conformances occurring in the factory

Objectives of the project: streamlining the Excel update process through automation, improving communication channels to ensure prompt information exchange, reducing delays in problem resolution, enhancing data representation through visual dashboards, and maintaining accurate non-conformance records in the specified areas.

Tool used: Microsoft Power BI and Microsoft Excel

Details of Papers/patents:None

Brief description of the working environment: During my PS-I at Siemens, I experienced a dynamic and innovative working environment. I had meaningful projects, received guidance from experienced professionals, and made valuable contributions. Siemens emphasized diversity, inclusion, and a strong work ethic. I worked on cutting-edge technologies and gained hands-on experience. The company fostered a learning culture with training programs, mentorship, and resources. Regular feedback helped me track my progress. Overall, my PS-I at Siemens provided valuable industry insights and equipped me with essential skills for my future career.

Academic courses relevant to the project: Technical Report Writing

Learning Outcome: Data Analysis and Data management

PS-I station: Siemens , Aurangabad

Student

Name: ISHITA MOHILE .(2021A4PS2316H)

Student Write-up:

PS-I Project Title: Simplification and Digitization of KANBAN

Short Summary of work done: Initially, I did data entry and analytics, followed by helping my mentor in simplifying the initially laid model to calculate the Kanban cards. In the second half, I learnt multiple softwares like Power BI, Power Apps, Power Automate, and Power Query and used them to create a Kanban Dashboard.

Objectives of the project: The major motive was to simplify the complex calculations needed to make the KANBAN board- a manufacturing planning technique. I further suggested digitizing the board as to reduce inefficiencies of handling a physical board.

Tool used: Excel, Power BI, Power Query, SAP

Details of Papers/patents:NA

Brief description of the working environment: All the employees were very approachable and ready to converse and help. I learnt a lot more than I expected.

Academic courses relevant to the project: Lean Manufacturing

Learning Outcome: I learnt the basics of Lean Manufacturing. I learnt the complexities of Excel. I was exposed to business analytics platforms like the Microsoft Power Platform. I had the opportunity to interact with various people and learn from their experiences.

PS-I station: Siemens , Aurangabad

Student

Name: RISHABH THOLE .(2021A4PS2942H)

Student Write-up:

PS-I Project Title: GIS Switchgear Location Mapping and Building Application to Calculate Greenhouse Gas Emissions

Short Summary of work done: During my Practice School-I (PS-I) at Siemens, I undertook two significant projects: GIS Switchgear Location Mapping and Building a Greenhouse Gas (GHG) Emission Calculator Web Application. For the GIS Switchgear Location Mapping project, I used MyMaps software to accurately locate and document GIS switchgear installations. By integrating photos of the sites, I created comprehensive

visual representations that improved maintenance efficiency and facilitated effective knowledge sharing among teams. In the Greenhouse Gas Emission Calculator Web Application project, I utilized front-end web development technologies to build an intuitive platform. The application allowed users to input data and obtain accurate GHG emission calculations, promoting environmental awareness and sustainability efforts. Throughout the internship, I collaborated with experienced mentors and professionals, learning valuable skills in mapping, web development, and sustainable engineering practices. The dynamic working environment at Siemens encouraged open communication and fostered a spirit of innovation. Overall, my PS-I at Siemens provided transformative learning experiences, enabling me to apply classroom knowledge to real-world projects and contribute meaningfully to the company's objectives. The internship equipped me with practical skills, enhanced problem-solving capabilities, and instilled a deeper understanding of the importance of sustainable practices in engineering.

Objectives of the project: Learn and Utilise MyMaps Software and Learn Front-End Web Development Technologies

Tool used: Html+CSS, Bootstrap , Javascript

Details of Papers/patents:None

Brief description of the working environment: During my Practice School-I (PS-I) at Siemens, I experienced a dynamic and professional working environment that fostered innovation and collaboration. The company's culture was built on a foundation of excellence, and I had the privilege of working with skilled professionals who were passionate about their work. The workplace was inclusive, encouraging open communication and valuing diverse perspectives. Siemens provided a conducive atmosphere for learning and growth, offering access to cutting-edge technologies and resources. The emphasis on teamwork and mutual respect made the working environment supportive and motivating.

Academic courses relevant to the project: None

Learning Outcome: During my PS-I at Siemens, I gained invaluable learning experiences that complemented my academic knowledge. I acquired practical skills in GIS switchgear location mapping, and web development technologies. Working on the Greenhouse Gas Emission Calculator Web Application enhanced my understanding of sustainable practices and environmental impact assessment. I learned to use MyMaps software effectively, which improved my mapping skills. Additionally, I honed my abilities in front-end web development, including HTML, CSS, Bootstrap, and JavaScript. The exposure to real-world projects and collaboration with experienced mentors expanded my problem-solving capabilities and enhanced my overall professional growth. The PS-I at Siemens was a transformative learning journey that equipped me with practical skills, teamwork skills, and a deeper appreciation for sustainable engineering practices.

PS-I station: Siemens , Aurangabad

Student

Name: UTSAV PURKAIT .(2021A4PS3078H)

Student Write-up:

PS-I Project Title: Portfolio Qualification Portal

Short Summary of work done: I was assigned with the responsibility of developing a qualification portal for Siemens' product portfolio. This portal serves as a comprehensive platform to store, manage, and notify test report information for various products. To achieve this, I established a structured database using SharePoint Lists. Furthermore, I enhanced the data representation through visually appealing elements in Power BI. In order to streamline repetitive tasks, I implemented automation using Power Automate. Additionally, I created a user-friendly application with Power App, which facilitated easy access and efficient management of the database. The project revolved around constructing a robust digital infrastructure to accommodate Siemens' product qualification reports effectively.

Objectives of the project: The objectives of the project are to create a centralized platform called the Portfolio Qualification Portal (PQP) to manage and access product qualification information at Siemens, Aurangabad. The platform aims to provide real-time updates on product qualification reports, track their expiration dates, and enable timely access to accurate data for various cross-functional teams in the factory. The project also aims to improve communication and efficiency within the factory by streamlining processes related to product qualification.

Tool used: Microsoft SharePoint Lists, MS Power BI, MS Power Automate, MS PowerApps

Details of Papers/patents:Nil

Brief description of the working environment: The working environment was decent, sometimes boring, but all the people I met were super approachable and very very helpful. They sometimes went out of their way to assist me whenever I needed help or had questions. It was refreshing to see how supportive and collaborative the team was, making it easy to approach them for guidance or advice.

The expectations of our mentors were reasonable but always pushed us to do our best. Working with different cross-functional teams taught me better communication and management.

Overall, the working environment and the people I met made my time there memorable and fulfilling.

Academic courses relevant to the project: Nil

Learning Outcome: I learnt software like Power BI, Power Automate, and Power Apps. Apart from that, I had a chance to look closely into core electrical instruments like switchgear, bushings, instrument transformers and wave traps. Got an overview of their internal workings, manufacturing processes and tests. I also got an overview of how a company as large as Siemens actually works, how different teams like R&D, logistics, production, sales, execution collaborate with each other and function smoothly.

Above that I was also able to brush up on my cognitive skills like teamwork, presentation, group discussion, etc.

PS-I station: Siemens , Aurangabad

Student

Name: AJINKYA DESHMUKH .(2021AAPS0479H)

Student Write-up:

PS-I Project Title: Data Structuring and IIoT

Short Summary of work done: I was given raw data in pdf format, and was asked to organise it through Excel. In the second project, I made connections in a device known as Wilink and connected different control panels through antennas

Objectives of the project: Organizing data and automating control panels

Tool used: Excel

Details of Papers/patents:No papers were included

Brief description of the working environment: Work environment was very good, where all senior officers were keen to help us. Learnt how a big company operates, in terms of production and also organisation.

Academic courses relevant to the project: Internet of things

Learning Outcome: How organized data helps in analysis and automation helps in industry

PS-I station: Siemens , Aurangabad

Student

Name: YASHOVARDHAN NAIK .(2021AAPS0621P)

Student Write-up:

PS-I Project Title: Condition monitoring of high voltage circuit breaker and Marketing inquiry app development in low-code environment

Short Summary of work done: In my work, I focused on advancing the field of circuit breaker condition monitoring by utilizing Arduino micro-controllers and developing a Marketing Inquiry application using the low-code environment of the Microsoft Power Platform. With Arduino micro-controllers, I implemented a real-time monitoring system that captured crucial operational parameters like current, voltage, and contact resistance. By integrating various sensors and leveraging the programming capabilities of Arduino, I successfully collected and analyzed data, enabling early fault detection and implementing preventive maintenance strategies. This approach significantly improved the reliability and safety of circuit breakers, minimized downtime, and optimized maintenance activities based on real-time equipment condition. Simultaneously, I developed a user-friendly Marketing Inquiry application using the low-code environment of the Microsoft Power Platform. With minimal coding requirements, I was able to create an application that streamlined the process of managing customer inquiries, automated lead generation, and enhanced customer engagement. The Marketing Inquiry app significantly reduced development time and costs while seamlessly integrating with other Microsoft services. Through my efforts in integrating Arduino micro-controllers for condition monitoring and utilizing the low-code development environment of the Microsoft Power Platform for the Marketing Inquiry application, I successfully demonstrated the power of technology in driving operational efficiency and improving customer interactions. These advancements

have contributed to enhanced reliability, optimized maintenance strategies, and increased customer satisfaction. Overall, my work showcases the potential of leveraging technology to drive innovation and make a meaningful impact in both industrial monitoring applications and customer-centric processes. By harnessing these tools, organizations can achieve greater efficiency, productivity, and customer satisfaction.

Objectives of the project: Overall, the objectives of the project are to leverage the capabilities of PowerApps, SharePoint, and Power Automate to optimize the management of marketing inquiries, automate workflow tasks, improve response times, and enhance the customer experience. And, to encompass early fault detection, preventive maintenance, performance optimization, safety enhancement, and effective life cycle management. By achieving these objectives, condition monitoring enhances the reliability, safety, and operational efficiency of HVCBs and the power systems they are a part of.

Tool used: Arduino Uno board, ESP32, Breadboard, Connecting Wires (H/w); Arduino Programming and Microsoft Power Platform (S/w)

Details of Papers/patents:None

Brief description of the working environment: During my Practice School Summer Internship (PS-I) at Siemens, Aurangabad, I would have the opportunity to work in a dynamic and innovative environment. Siemens, known for its global presence and expertise in various sectors, provides a conducive setting for professional growth and learning.

In this working environment, I would expect to be exposed to real-world projects and challenges, collaborating with experienced professionals. The company's focus on cutting-edge technologies and solutions would provide a rich learning experience, enabling me to expand my knowledge and skills in areas such as power generation, transmission, and distribution, industrial automation, transportation, and healthcare.

As an intern at Siemens, Aurangabad, I would have certain expectations from the company. Firstly, I would anticipate receiving guidance and mentorship from senior professionals, who can provide valuable insights and support in my assigned projects. Additionally, I would expect to work on challenging assignments that allow me to apply my theoretical knowledge, enhance my problem-solving abilities, and develop practical solutions.

During my PS-I, I would actively seek opportunities to learn and gain hands-on experience in various aspects of Siemens' operations. This could include understanding the company's manufacturing processes, exploring research and development activities, and getting exposure to the company's sustainability initiatives. I would aim to engage with cross-functional teams, participate in workshops or training sessions, and make the most of networking opportunities to broaden my industry knowledge and build professional connections.

Overall, being allotted Siemens, Aurangabad for my PS-I would provide a platform for me to immerse myself in a challenging and rewarding work environment. It would enable me

to contribute to the company's goals while acquiring valuable skills, knowledge, and experiences that would lay a strong foundation for my professional growth.

Academic courses relevant to the project: Power systems, Robotics and Automation

Learning Outcome: Understanding of Arduino Programming and Microsoft Power Platform.

PS-I station: Siemens , Aurangabad

Student

Name: KINSHUK UNNAM .(2021B3A71878H)

Student Write-up:

PS-I Project Title: Documentation of DPR and MySQL

Short Summary of work done: A comprehensive assessment of the DPR software was conducted, thoroughly examining its functionalities and data calculation processes, including the derivation of Standard Man Minutes (SMM) and cycle times for individual machines. Key stakeholders, encompassing supervisors, employees, and management, were engaged in interviews to glean insights into their needs, expectations, and pain points concerning the DPR software's operational facets. Valuable feedback from these discussions was meticulously documented and seamlessly integrated into the functional documentation. Moreover, an exhaustive scrutiny of existing DPR-related materials, such as user manuals and technical specifications, was undertaken to gauge their pertinence and comprehensiveness. Any gaps or areas necessitating enhancement or clarification were duly pinpointed. Drawing upon the stakeholder input and thorough documentation analysis, a definitive set of functional requisites for the DPR software was formulated, encompassing detailed procedural guidelines for accessing and effectively leveraging each component of the site DPR. To effectively navigate MySQL, one must grasp its foundational concepts, encompassing purpose, features, and relational advantages as a database management system. Proficiency in SQL syntax is key for database interaction. Safeguarding the DPR database involves a well-structured backup strategy, including method selection, scheduled backups, and automated processes, alongside regular testing of recovery procedures. Prioritizing data security entails user account setup with precise access privileges, fortified by authentication mechanisms and encryption

methods. Robust user authentication plugins and robust passwords contribute significantly to a secure data environment.

Objectives of the project: To document company's site, its functionalities and every single detail and also using learning MySQL along the way.

Tool used: Microsoft Word ,Excel,MySQL

Details of Papers/patents:None

Brief description of the working environment: During my PS-I, I got to work in an exciting environment where I focused on handling documents and managing databases using MySQL. The company wanted me to pay close attention to details, work well with others, and really understand how databases work.

In this interesting place, my main job was to make sure documents were well-organized and to improve the way we handle them. This needed me to be careful and follow a step-by-step method. The company really stressed the importance of making documents clear and accurate, which helps everyone understand things better and keeps projects running smoothly.

I also got to be part of a team that takes care of storing and getting information from databases using MySQL. It was like using a super-organized spreadsheet to keep track of things. I learned a lot from my teammates, and they showed me how the things we learn in class are used in real-life situations.

Academic courses relevant to the project: Computer Science

Learning Outcome: Process of documentation and some basics about excel and MySQL

PS-I station: Siemens , Aurangabad

Student

Name: DHRUV MUKESH CHANDAK(2021B3AA1068G)

Student Write-up:

PS-I Project Title: Centralisation of database and visualising it using Power BI

Short Summary of work done: Studied the project plans of all the projects in Siemens GIS factory, made a database of those and then integrated it with power BI

Objectives of the project: Learning power BI and data analysis

Tool used: Power BI, Microsoft lists , power query

Details of Papers/patents:No paper

Brief description of the working environment: Very good working environment , people are very humble and down to earth

Academic courses relevant to the project: None.

Learning Outcome: Power BI, Microsoft Lists, Power Query

PS-I station: Siemens , Aurangabad

Student

Name: KARTIKEYA TANDON .(2021B5A33183H)

Student Write-up:

PS-I Project Title: Streamlining Business Operations

Short Summary of work done: The work encompassed two automation projects carried out for Siemens Aurangabad's Business Operations department. The first project aimed to automate the cash outflow forecasting process, which previously relied on a manual Excel sheet. The existing system required laborious manual data entry and analysis to predict upcoming payments, leading to potential errors and inefficiencies. The second project involved automating freight and shipping operations management. The team at Siemens Aurangabad previously used a manual Excel sheet for this task, which was time-consuming and prone to errors. To overcome these challenges, the project aimed to minimize manual data entry and integrate delivery locations from a rate card to streamline logistics processes.

Objectives of the project: Automation of Accounts Payable Forecasting and Freight and Shipping Management Database

Tool used: Excel

Details of Papers/patents:None

Brief description of the working environment: Siemens, Aurangabad is situated in the city's industrial area, providing a conducive environment for professional growth. The team at the company is incredibly supportive and interactive, making us feel welcomed from the start. During the orientation, they actively involved us in getting familiar with the different plants and workshops, allowing us to gain a comprehensive understanding of the organization and its vision. This experience was a valuable opportunity to immerse ourselves in the corporate culture of a multinational corporation, learning about its values and principles. It was a great learning experience that provided insights into how a successful MNC operates and fosters a collaborative and innovative work environment.

Academic courses relevant to the project: Fundamentals of Finance and Accounting

Learning Outcome: Managing and optimizing large excel databases. Understanding day to day business operations of a multinational company.

PS-I station: Siemens , Goa

Student

Name: ADITYA SHARMA .(2021A3PS2446P)

Student Write-up:

PS-I Project Title: Control Relay Panel

Short Summary of work done: Testing of different types of panels and configuration of relays. Also worked on the automation of the panels using SCADA

Objectives of the project: Testing of Control Relay and protection panels

Tool used: SCADA,Digsi

Details of Papers/patents:NA

Brief description of the working environment: Nice working environment and overall very helpfull company employeesn

Academic courses relevant to the project: Power Systems

Learning Outcome: Electrical Core

PS-I station: Siemens , Goa

Student

Name: VAASU GARG .(2021ABPS2007P)

Student Write-up:

PS-I Project Title: Material Replenishment

Short Summary of work done: Designed a 3 dashboard system from scratch leveraging various programming tools. Post that, I worked hard on implementing the software on the shop floor. Till now, I have given training to more than 15 people for the software. The implementation is ongoing. The software has been installed in more than 15 PCs.

Objectives of the project: Developing a technology to considerably reduce lead time for material request generation

Tool used: Python, Django, PyQt, QtDesigner, Visual Studio Code

Details of Papers/patents:NA

Brief description of the working environment: The working environment has been very positive. I was able to learn a lot not only from the internet, but also the mentors and everyone around me. The environment was really healthy and fostered good relationships with industrialists.

Academic courses relevant to the project: Computer Programming, Operations Management

Learning Outcome: The key learnings from the project were how to build a backend and front end with the help of Django, PyQt, Python and various issues that can occur in the manufacturing setting.

PS-I station: Siemens , Goa

Student

Name: SIFAT SINGH .(2021B1AB2729P)

Student Write-up:

PS-I Project Title: Secure Assembly Concept Prototyping and OEE Tracking Tool

Short Summary of work done: During Orientation, we were introduced to SIEMENS' four plants: GIS, PA, VI, and SYS. Each plant had its distinct products and assembly processes. My journey started in GIS under the guidance of Gaurav Bansod Sir, an exceptional mentor always eager to assist with any questions. The learning experience was hands-on and engaging, starting with learning PLC Circuits. The Prototyping Lab served as our playground where we learned the assembly and wiring of PLC circuits and delved into the programming aspect using SIEMENS SIMATIC Software. The most exciting part was working on two enthralling projects. We collaborated on concept visualization, sketching out prospective designs for the company's future endeavors. It was inspiring to contribute our creative ideas to real-world applications. Additionally, I had the opportunity to undertake a personal project, the OEE Analytical Tool. This tool, a versatile spreadsheet, became applicable across various divisions of the company. It empowered teams to calculate and track equipment efficiency while providing valuable insights through simple, dynamic graphs that updated with new data each day. The experience was both intellectually stimulating and rewarding as I honed my skills, contributed to meaningful projects, and witnessed the practical application of our work in enhancing processes throughout SIEMENS.

Objectives of the project: The first project: OEE Tracking Tool. OEE is used in Lean Manufacturing companies for answering two questions: 1) Is the machine/production line working effectively? 2) Where should we focus to improve the efficiency metric? SECOND PROJECT: Brief: Computer Vision Based system to be implemented on the assembly station to prevent operator errors that can result in part losses going up to 40,000/piece. I helped them pitch their idea to the contractors with the help of an animation I created.

Tool used: Microsoft Excel: Basic VBA and Intermediate Graphs, MagicaVoxel and Blender

Details of Papers/patents:-

Brief description of the working environment: Everything was satisfactory. We even got our own desks towards the end :)

Academic courses relevant to the project: Not answering this since I have not started most of my manufacturing courses.

Learning Outcome:

- Introduction to Lean Principles in Manufacturing,
- Brief overview of the 4 plants within the complex responsible for different products
- Basics of PLC Circuits, Wiring, and Assembly
- Ideation for making a particular workstation faster
- Concept of OEE, implementing that into MS Excel for Data Visualisation and Report Generation for everyday use
- Prototyping, Modelling, and Animation with simple but effective tools

PS-I station: Siemens , Mumbai

Student

Name: PRATHAM ANIL JIWANANI(2021AAPS1972G)

Student Write-up:

PS-I Project Title: Designing of Programmable variable ac/dc power supply

Short Summary of work done: During my PS-I internship, I focused on power supply-related work. I gained experience in simulating power supplies using LTspice software. Additionally, I familiarized myself with various electrical appliances, such as contactors and transformers. Overall, the internship provided valuable practical knowledge and enhanced my understanding of power supply systems.

Objectives of the project: To learn About power supply and components used

Tool used: S/w-LTspice

Details of Papers/patents:NA

Brief description of the working environment: As an intern or trainee during your PS-I, the company would have expected you to be open to learning, proactive in asking questions, and willing to contribute to projects or tasks assigned to you. They might have wanted you to demonstrate good teamwork skills and professionalism, while also being receptive to feedback and constructive criticism.

Overall gaining practical insights into the field of power supply and contactors, and meeting the company's expectations during your time there.

Academic courses relevant to the project: Power Electronics

MUE

ED

Electrical Machines

Learning Outcome: Learnt About power supply and components used

PS-I station: Siemens , Mumbai

Student

Name: RISHA NAHATA .(2021B1A32275P)

Student Write-up:

PS-I Project Title: Designing and Optimisation of a Programmable Logic Controller (PLC)-Based Control System for Contactor Testing: Enhancing Performance, Reliability, and Test Efficiency using Ladder Logic and Function Block Diagram

Short Summary of work done: I learned the fundamentals of control systems, ladder logic programming, and function block diagrams and applied them to programme a PLC (programmable logic controller) for an electric endurance of Siemens contactors.

Objectives of the project: The goal of my project was to create and optimise a cutting-edge contactor testing control system based on a Programmable Logic Controller (PLC). The major goal was to improve contactor evaluation performance, reliability, and test efficiency by implementing advanced control algorithms using Ladder Logic and Function Block Diagram (FBD) programming. We hope to shorten contactor testing operations,

increase measurement accuracy, maintain safety compliance, and pave the path for continued innovation in the field of industrial automation by establishing a user-friendly and versatile control system.

Tool used: LOGO! Soft, ladder logic programming, function block diagrams

Details of Papers/patents:-

Brief description of the working environment: The PS station offered an encouraging learning atmosphere. The mentors were always willing to assist. It exposed us to real-world challenges and helped us boost our personal and professional development.

Academic courses relevant to the project: Electrical Sciences, Control Systems

Learning Outcome: Some of the key learnings from working closely in the R&D test lab at Siemens were:

- PLC Programming Skills
- Integration of Hardware and Software
- Understanding Contactor Testing Requirements
- Iterative Design and Optimization

PS-I station: Siemens , Mumbai

Student

Name: MANAV GANESH .(2021B3AA1069P)

Student Write-up:

PS-I Project Title: Designing an AC-DC power supply for the testing of contactors

Short Summary of work done: We had to do a lot of research as we didn't have prior knowledge of a lot of concepts as we had not learnt electronics as we are dual degree students. We were given a problem statement and we had to suggest an optimal solution by proposing a block diagram to tackle the problem. We then started to simulate the circuit and managed to get the desired output.

Objectives of the project: The main objective of the project was familiarize us with the process of designing a power supply, encourage us to learn about various electronic components and make an attempt to design and simulate a circuit which would take in an input of 230V AC and give an output ranging between 0-450V and this can be AC or DC depending on what the user wants

Tool used: Ltspice, arduino (c/c++)

Details of Papers/patents:no papers/patents

Brief description of the working environment: The working environment was great. We felt comfortable to approach the employees of the company for any issues or queries we had. We did not get choose the project we wanted. They were allocated based on branch.

Academic courses relevant to the project: ECE F211,ECE F215, ECE F214, ECE F241, ECE F244

Learning Outcome: We gained a lot of knowledge about various electronic components, learned circuit simulation using LTspice, and learned about the general design and research process while approaching such a problem.

PS-I station: Siemens , Mumbai

Student

Name: ATHARVA PANKAJ DESHPANDE(2021B4A82309G)

Student Write-up:

PS-I Project Title: Data Analytics to improve Breaker Productivity

Short Summary of work done: I visited the production line to understand how contactors and circuit breakers are manufactured right from scratch. It helped me visualize the various tests that take place before dispatching any product.As a part of the Industrial Engineering Department, my task was not only understanding the project on data analytics but also the various aspects of Time Study, Resource Planning, Productivity Improvement, and Capacity Planning. I learnt new tools like Power BI and SQL and

implemented the commands in it. I learnt about Fishbone Analysis, Root Cause Analysis, Digital Twin Technology and Radio Frequency Identification.

Objectives of the project: Visualizing and Assessing the Warehouse data of Air Circuit Breakers using Power BI and SQL

Tool used: Power BI, SQL , DAX

Details of Papers/patents:NA

Brief description of the working environment: The working environment was quite friendly. The managers made me feel comfortable with the corporate setup for the initial week and asked me about my interests and skills. Based on the same, a project was allotted. I was given the required resources to study and develop the additional skill which the project required. Power BI and SQL were very new tools for me which I learnt during the PS-I tenure. The managers considered the fact that we as second year students didn't have much knowledge of the core subjects required to solve a problem statement and assigned the tasks accordingly.

Academic courses relevant to the project: Power BI can be used to aid data science although I am unsure of any specific course offered and related to this.

Learning Outcome: Efficiency Improvement, Inventory Management, Process Optimization, and Performance Monitoring.

PS-I station: Siemens , Mumbai

Student

Name: PARSHAV JAIN(2021B4AA3024G)

Student Write-up:

PS-I Project Title: Designing a programme power supply

Short Summary of work done: There was a commercial power supply ordered from an external vendor, we designed an analogue and digital version of the same programmable power supply

Objectives of the project: Get a simulation of a power supply which is programmable

Tool used: Lt spice, c , c++, java

Details of Papers/patents:None

Brief description of the working environment: Good kind and knowledge able people about electrical engineering. Great food, and a good office.

Academic courses relevant to the project: Electrical sciences, computer programming

Learning Outcome: Ltspice, arduinos, electrical equipment

PS-I station: SPENTA INTERNATIONAL LTD. , Palghar

Student

Name: MADHAV SINGAL .(2021A7PS0447P)

Student Write-up:

PS-I Project Title: Market Research on Sports Garment Manufacturers in India with Emphasis on Socks

Short Summary of work done: 1. Conduct in-depth desk research to gather relevant information on the sports garment manufacturing industry in India. This will include analyzing industry reports, market studies, trade publications, and online databases. 2. Identify and compile a list of garment manufacturers in India specializing in sports garments, particularly socks. Gather information about their production capacities, infrastructure, technology adoption, certifications, and client base. 3. Analyze the competitive landscape by evaluating the strengths, weaknesses, opportunities, and threats (SWOT analysis) of the identified manufacturers. 4. Identify and study the selection criteria used by international sports brands when choosing suppliers for socks. This may involve analyzing case studies, industry publications, and interviewing industry experts if feasible. 5. Summarize the findings and insights derived from the research in a structured report, including detailed profiles of manufacturers, key market trends, and supplier selection criteria. 6. Present the research findings to the project stakeholders, highlighting actionable recommendations for our company to improve our market position and attract more international sports brands as clients.

Objectives of the project: Gain a comprehensive understanding of the sports garment manufacturing industry in India, with a specific focus on socks.

Tool used: N/A

Details of Papers/patents:N/A

Brief description of the working environment: Through this research, I gained valuable insights into the sports garment manufacturing industry in India. I developed an understanding of the competitive landscape and identified key players in the market, including renowned brands like Nike, Adidas, and Puma. Additionally, I learned about the emerging trends and advancements in sports garment manufacturing, such as sustainable practices, innovative materials, and technological integration. This initial research phase provided me with a solid foundation for the upcoming weeks of my project. It helped me recognize the importance of staying updated with industry trends and understanding consumer preferences to deliver high-quality products that meet the demands of global sports brands.

Academic courses relevant to the project: Manufacturing Related Courses

Learning Outcome: Develop research and analytical skills by gathering and organizing information from various sources, such as industry reports, market databases, and manufacturer websites.

PS-I station: SPENTA INTERNATIONAL LTD. , Palghar

Student

Name: DHRUV TANDON .(2021A8PS1221P)

Student Write-up:

PS-I Project Title: Spenta International

Short Summary of work done: During my PS-I (Practical Training Phase I) in the sock manufacturing industry, I conducted in-depth research on the sports garment manufacturing industry in India, with a focus on sustainable practices. I gained a deeper understanding of the key players in the Indian market, industry trends, and the factors driving growth. Challenges during the research process included gathering up-to-date information and sorting through vast amounts of data to prioritize relevant findings. Despite these challenges, I successfully compiled a concise and informative research summary. Throughout the experience, I learned valuable lessons, such as the significance of adapting to changing trends, collaborating with stakeholders, and staying informed through continuous learning. The importance of sustainability in business practices also made a profound impact on me, prompting me to seek out environmentally conscious brands and products in my personal life. Furthermore, I recognized the importance of timely delivery and adherence to deadlines in the fast-paced sports industry. Understanding the impact of a manufacturer's location on logistics and supply chains influenced my decision-making as a consumer. Additionally, the emphasis on quality, branding, and storytelling in business success inspired me to be more discerning as a consumer and appreciate the efforts behind successful brands. Overall, this PS-I not only enriched my knowledge of the sports apparel industry but also influenced my personal choices and perspectives, making me a more informed and conscious individual.

Objectives of the project: , the information about the sock manufacturing industry has not only provided me with insights into the business world but has also influenced my personal choices and perspectives. I now strive to be a more informed and conscious consumer, considering sustainability, quality, and brand values in my decisions. Additionally, the emphasis on time management and adaptability has encouraged me to be more organized and open to learning in all aspects of my life.

Tool used: Presentation microsoft

Details of Papers/patents:No particular papers

Brief description of the working environment: During my PS-I (Practical Training Phase I) in the sock manufacturing industry, the working environment was dynamic and fast-paced. As a researcher, I was expected to stay updated with the latest industry trends, customer preferences, and sustainability practices. I had to adapt quickly to changing demands and be flexible in my research approach to ensure the accuracy and relevance of information. The company had a strong emphasis on sustainability, and this learning experience made me more conscious of the environmental impact of products and the need for eco-friendly practices in business operations.

In the company, I was encouraged to collaborate with various stakeholders, including retailers, distributors, and potential clients, to expand market reach and build strong relationships. Timely delivery and adherence to deadlines were crucial in this industry, and it instilled in me the importance of effective time management.

Throughout my PS-I, I gained valuable insights into the significance of quality, branding, and storytelling for business success. As a result, I became a more discerning consumer, seeking products that align with my values and connecting with brands that have compelling narratives.

The experience also piqued my interest in entrepreneurship, as I learned about starting a sock manufacturing business and the considerations involved in running a successful venture.

Overall, this PS-I not only provided me with industry-specific knowledge but also influenced my personal choices and perspectives. I now strive to be an informed and conscious consumer, while also valuing adaptability, time management, and sustainable practices in both my personal and professional life.

Academic courses relevant to the project: Supply Chain Management

Learning Outcome: During the research process for this project, I gained a deeper understanding of the sports garment manufacturing industry in India and its dynamics. I learned about the key players in the market, industry

trends, and the factors driving growth. This research experience expanded my knowledge of the global

sports apparel industry and allowed me to explore the unique aspects of the Indian market.

I also learned about the significance of sustainable manufacturing practices in the industry. The growing

emphasis on eco-friendly materials and processes highlighted the importance of environmental

consciousness in business operations. This learning experience has made me more aware of the need for

sustainable practices across various industries.

PS-I station: SPENTA INTERNATIONAL LTD. , Palghar

Student

Name: NEIL CHATURVEDI .(2021AAPS0026P)

Student Write-up:

PS-I Project Title: Conducting comprehensive market research on garment manufacturers specializing in sports brands, with a specific focus on socks.

Short Summary of work done: Week 1: Orientation and Research • Conduct initial research on the sports garment manufacturing industry in India. • Explore key players, industry trends, and market dynamics. • Summarize the findings in a research summary. Week 2: Manufacturer Profiling • Create a list of sports garment manufacturers in India, focusing on socks. • Gather information on production capacities, infrastructure, technology adoption, certifications, and client base. • Prepare detailed profiles for each manufacturer. Week 3: Competitive Analysis • Perform a SWOT analysis for each identified manufacturer. • Evaluate their strengths, weaknesses, opportunities, and threats in the market. • Prepare a comparative analysis report. Week 4: International Brand Supplier Selection Criteria • Analyze the selection criteria used by international sports brands when choosing suppliers for socks. • Identify common factors and create a comprehensive list. • Summarize your findings in a document. Week 5: Research Report • Summarize research findings, including manufacturer profiles, market trends, and supplier selection criteria. • Prepare a detailed report highlighting key insights and recommendations.

Objectives of the project: Conducting market research and performing business analysis with regards to the Sports Apparel Manufacturing industry in India.

Tool used: PowerPoint, Word, Google Docs, Google Search

Details of Papers/patents:None

Brief description of the working environment: Remote work, favourable discussion environment that fostered an environment of learning and group discussion. Not too time consuming, which was good, and we learnt how to perform research, as opposed to being spoon fed everything.

1. The project has allowed me to receive a broad overview of the sports apparel industry, both in India and worldwide - this includes researching market trends, researching competitors and competitive strategies, government initiatives and analyzing the sectors from the point of view of an investor or analyst.
2. The project has also allowed me to research into a sector that is not very popular at the very least, as an object of study, thus helping me differentiate myself and my skill set from that of my peers.
3. I have gained an understanding of consumer preferences in India, understanding how and why they buy what they choose to buy. This is extremely important for virtually every company, and is a skill that will really help me in the future.
4. The research has also given me insight into the basics of Competitive Analysis- a tool which is currently underutilized but will be in greater demand across industries.
5. The project has helped give me a basic understanding of quality control, something that is extremely important in effectively every industry, from FMCG to Software,

6. The research has also helped me understand how to analyze and grow a business. Horizontal and vertical integration are concepts I had not even heard of before this project, and is something that will definitely help me in the future.

Academic courses relevant to the project: Supply Chain Management

Learning Outcome: Market Research, Business Analysis, Supply Chain Analysis, Competitive Analysis, SWOT Analysis, PESTLE Analysis

PS-I station: SPENTA INTERNATIONAL LTD. , Palghar

Student

Name: AGARWAL LUVISH GIRISH .(2021AAPS0627P)

Student Write-up:

PS-I Project Title: Supply chain management

Short Summary of work done: Report has it all

Objectives of the project: To understand supply chain via company analysis

Tool used: Analytics, excel, ppt, word, crunchbase

Details of Papers/patents: Report submission and seminar presentation

Brief description of the working environment: Very good work environment and faculty support

Academic courses relevant to the project: Supply chain management and research abilities either good communication skills

Learning Outcome: Exposure, research, presentation, supply chain and manufacturing knowledge

PS-I station: SPENTA INTERNATIONAL LTD. , Palghar

Student

Name: PRANAV PRASHANT KOTI .(2021B1AB1289P)

Student Write-up:

PS-I Project Title: Manufacturing case study with soecial emphasis on socs

Short Summary of work done: Learned about sock manufacturing

Objectives of the project: Understanding sock manufacturing

Tool used: Presentations

Details of Papers/patents:None

Brief description of the working environment: Good working environment , to learn sock manufacturing

Academic courses relevant to the project: Manufacturing

Learning Outcome: Understanding sock manufacturing

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