Birla Institute of Technology & Science, Pilani
Pilani | Dubai | Goa | Hyderabad
Practice School Division

CHRONICLES

Cement, Infrastructure, Mechanical, Textile, and Steel

PRACTICE SCHOOL - I

SUMMER - 2021

From the Desk of the Editor

It is my great pleasure to bring forth the 3rd edition of the PS-I Chronicles. This edition features over 1800 articles from PS-I students sharing their experiences during summer 2021.

The basic premise behind the release of PS-I Chronicles is to document the PS-I learning experience of students keeping the below objectives in view.

- To provide more information on the learning experiences by immediate senior students and PS-I faculty about stations, and thereby enlightening the learning opportunity among the student community.
- To provide the faculty with the enhanced information about the type and nature of work carried out at the organization.
- To transform the knowledge gained at the organization into class room teaching and also to identify the scope of deepening the collaborations with organization.

The articles have been classified into five categories based on the industry domain.

- Chronicle 1: Information Technology
- Chronicle 2: Electronics
- Chronicle 3: Chemical, Mechanical, Cement, Textile, Steel, Infrastructure
- Chronicle 4; Health Care and other
- Chronicle 5: Finance and Management

I would like to thank students for sharing their experiences during their stint at the organization. I would also like to thank Prof. Arun Maity and Prof. M. K. Hamirwasia for reviewing the articles and providing us the feedback. I would also like to extend my thanks to Mr. Om Prakash Singh Shekhawat, Prof. S Murugesan, Prof. G Muthukumar and Mr. Varun Singh of the Practice School Division, of BITS, Pilani – Pilani Campus for their help in bringing out this edition of PS-I Chronicles.

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

Anil Gaikwad

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Domain: Cement, Infrastructure, Chemical, Mechanical, Steel

PS-I station: Adani Power-Chemical (Biogas design) , Tirora

Student

Name: ADITI DASH . (2019A1PS0686P)

Student Write-up

Short Summary of work done: I had to work towards designing a biogas plant for the sewage and horticulture waste. this included research and literature review from scratch and the final model was as detailed as giving the exact dimensions production and cost analysis for the plant.

PS-I experience: The project mentor as well as industry mentor were very supportive and understanding. Luckily my project partner was also a very responsible person so i never faced issues while working with him.

Learning Outcome: It was a great introduction to how the corporate world functions.

PS-I station: Adani Power-Computer science , Tirora

Student

Name: SATYAM GUPTA . (2019B3A71277H)

Student Write-up

Short Summary of work done: It was a web development project. In this project, a responsive website portal is being created which can be used for various purposes such

as: maintaining various battery banks data on a single platform, storing new test or maintenance records, capacity test records etc. For building a complete website , we require the knowledge of both backend and frontend. For developing this portal we used HTML, CSS, JS, Bootstrap, Nodejs, Vue.JS, figma, CMS(Directus), ER diagrams for DBMS . Also we have used some of the frameworks of Node.JS.

PS-I experience: It was a good experience to start with for someone who joined Adani Power for a web development work, it has been a really good learning experience. I came across various technologies and their real life implementations. The people working over here are really helpful and always happy to help when approached.

Learning Outcome: During my PS work I learned both backend and frontend technology. Also, I got to interact with company individuals and enhance my communication and presentation skills .

PS-I station: Adani Power-Electronics , Tirora

Student

Name: AYUSH KUMAR SINGH . (2019A8PS1313H)

Student Write-up

Short Summary of work done: My project was "Real-time tuning of Closed loops of Boiler and Turbine using MATLAB". We had to introduce a closed-loop (configured in DCS) optimization approach by introducing advanced algorithms realized in MATLAB.
For this, we learnt Control Systems and PID Controllers theory in depth and had to learn and get familiar with the vast library of Simulink for implementing various blocks from it using which we designed and simulated the closed loop desired by the company. The blocks which were of utmost importance were PID Controller block, Transfer Function block and the Scope block. After we designed the loop, we had to optimize the PID gains for which we used the PID Tuner application. With the help of this application we were able to optimize the gains, reduce the rise and settling times with the minimum overshoot which was in accordance with the company's requirements. Optimized PID gains generated from advanced algorithms realized in MATLAB helped in the optimization of

closed loops and this will help the company save it's resources(both labour and material) and will aid the company in reduction its carbon footprint.

PS-I experience: The learning experience has been great as we got to know so many new concepts and we learnt about how to use them in real-life situations. We had a goal in sight and worked hard day and night to see the chequered flag. These projects helped us in developing industrial skills which are otherwise very difficult to gain. We learnt many crucial skills which are highly necessary in the industry and in our day to day life like time management, teamwork, problem-solving attitude, etc. We learnt how to work for a company, how to complete work within a given deadline, how to give preferences to different tasks, if ever stuck, how to get through it. This journey was very interesting and fruitful. Sure, we faced some challenges but they were not enough to break us and we went from strengths to strengths to complete the project.

Learning Outcome: We studied Control Systems and how to use it to solve real-world problems; how to use MATLAB to solve various problems; how to create and run open and closed loop simulations using Simulink; explored the vast library of SIMULINK and discovered the various blocks and how to implement them in a closed loops. We came up with several approaches to address the optimization problem, and we learnt about techniques that were previously employed but are no longer applicable due to MATLAB version updates. We also learned about how companies employ reverse engineering methods to solve problems that are difficult to solve due to closed loop complexity. We got an insight on how to read and write current OPC UA server data in this real-time project. We attended webinars linked to core courses in phoenix branch, where we learned about the newest technology breakthroughs in the industry straight from professionals in the field.

Name: KHUSHI BAKLIWAL (2019B2A81018P)

Student Write-up

Short Summary of work done: Real-time tuning of closed loops of boiler and turbine using MATLAB" was the title of my project. By introducing advanced algorithms realized in MATLAB, we were able to implement a closed-loop (specified in DCS) optimization strategy. For this, we had to study Control Systems and PID Controllers in depth, as well as learn and become comfortable with Simulink's enormous library of blocks, which we used to create and simulate the closed loop that the company required. The PID

Controller block, Transfer Function block, and Scope block were the most important blocks. Following the loop design, we needed to tune the PID gains, which we did with the PID Tuner tool. We were able to optimize gains, reduce rise and settling times, and achieve minimal overshoot with the help of this application, which met the company's needs. Optimized PID gains provided by modern algorithms realized in MATLAB aided in the optimization of closed loops, allowing the company to save resources (both labor and material) and minimize its carbon footprint.

PS-I experience: The learning experience was fantastic because we learned a lot of new concepts and how to use them in real-life scenarios. We had a goal in mind and worked diligently day and night to achieve it. This project aided us in acquiring industrial knowledge that would have been impossible to obtain otherwise. We learned a variety of important skills that are useful in the workplace and in everyday life, such as time management, teamwork, and a problem-solving approach etc. We learned how to work for an organization, how to accomplish work within a certain timeframe, how to prioritize work, and how to get untied if we got stuck. This was a fascinating and successful journey. We did confront some problems, but they were not enough to break us, and we were able to complete the project by going from strength to strength.

Learning Outcome: We got to learn about Control Systems and how to use them to solve real-world problems; how to use MATLAB to solve various problems; how to make and run simulations of open and closed-loops using Simulink and explored the vast library of SIMULINK and learnt about the various blocks in it and also how to implement them in the closed loops. To solve the optimization problem we came up with various techniques and also got to learn about the techniques that were used in the past but are no longer applicable because of the update in MATLAB versions. We also learnt about how companies use reverse engineering techniques for solving certain problems which cannot be solved due to the complexity of closed loops.
We also got insight on how to read and write current OPC UA server data in this real-time project. We attended webinars related to core courses in the phoenix branch through which we got to know about the latest technological advancements in the industry directly from the industry experts. We got to know about a new software named TeamViewer from our company mentor which links computers, cellphones, servers and anything else with quick, high-performance connections, even in low-bandwidth areas like outer space.

PS-I station: Adani Power-Mechanical , Tirora

Student

Name: SATWIK ARINDAM HOTA . (2019A4PS0516H)

Student Write-up

Short Summary of work done: The project allotted to us was regarding "study of impact of weight and quality of crusher hammer on product life cycle" in the Tirora thermal power plant where we had to come up with solutions to improve the working hours of the crusher hammers in the ring granulators which will impact the efficiency of the power plant.

PS-I experience: Overall I had a great experience to getting to know what work is going on in the power plant. Theoretically, we do know the procedure being carried out for power generation but the little steps involved here give us practical insights into the industry operation. It was however a much challenging station to complete the assigned work as one cannot access all the machines physically in the power plant in the work-from-home mode but the project had more to do with the design aspects and was a very good industry experience.

Learning Outcome: First couple of weeks involved studying major research papers on coal handling plants and try and come up with solutions to work on. Later on, we also managed to learn the basics of many software like Solidworks, Creo Parametric, MATLAB, Ansys, AutoCAD, Fusion 360 which are going to be very helpful in the design aspect of Mechanical Engineering.

Name: MUJUMDAR ISHWARI AVINASH . (2019A4PS1363H)

Student Write-up

Short Summary of work done: Required size of coal used for steam generation in boiler is below 25 mm and hence coal crushers are needed to get this desired coal particle size before they can be fed into the mill from their initial size of 300 mm.But in many cases the coal crushers break down before their intended life of 2.5-3 months which increases the cost of operation. Hence our work consisted of finding solutions to enhance the life of ring hammers.

PS-I experience: My experience was good.

Learning Outcome: I got to learn new concepts and also learnt some design and simulation softwares which helped our project.

PS-I station: Aditya Birla Science & Technology-Chemical , Mumbai

Student

Name: MIHIR KUMAR JHA . (2019A1PS1050G)

Student Write-up

Short Summary of work done: The project was to create a web-based environment for chemical process monitoring and simultaneous analytics of live video from camera system. The objective of this work is to detect process anomaly, external disturbances, and configuration failure in reactor system. This work will help in developing decision-making strategy and action plan from plant operators standpoint with prior intimation of expected equipment failure.

PS-I experience: Due to the Covid-19 pandemic, PS -1 was work from home, still it did not affect much as the project did not involve on-site work. My mentor used to call regularly to check the progress and clear doubts regarding the project. This helped me to stay focused for completing the project. I believe the knowledge I gained during this project will certainly help me in my future endeavours.

Learning Outcome: My project helped me gain knowledge in Machine Learning and Web Development, and gave me a flavor of using software development for process engineering which helped me explore core chemical engineering from a different perspective.

Name: KHUSHI KHANNA . (2019B4A10850H)

Student Write-up

Short Summary of work done: My project was Optimization of Copper Extraction and the main aim of this project was to get a better understanding of Copper, its ores, extraction processes; mainly focusing on the leaching of slag in Aqueous ammonia.
Further, the project involved studying the different parameters that affect the leaching process and analyzing them. For this, a time-series model was made, based on a past experiment so as to predict and find a better way to find an optimum value to increase the copper extraction.

PS-I experience: My overall PS-1 experience was really good. My mentor & faculty guided me in every possible to complete my project. It was an incredible opportunity, giving me exposure to various things about the working of a company along side giving me practical knowledge.

Learning Outcome: PS -I helped me get a first-hand experience on how the industry works and the work culture. This aided me immensely in getting a better understanding of the industry. This provided a practical learning of the core and other related chemical processes. Besides this, I also got to apply mathematical and other ML related concepts to my project.

PS-I station: Aditya Cement Works-Chemical , Shambupura

Student

Name: NACHIKETA SOURABH . (2019A1PS1046G)

Student Write-up

Short Summary of work done: Learned about the manufacturing of cement and concrete . Made two reports for the company on concrete design mix and raw mill power and heat loss optimization.

PS-I experience: Throughout my internship experience, I was able to develop and foster a truly positive and compassionate learning environment , all through the support and mentorship of my cooperating teacher. Through the application of time management, organization, discipline and consistent practice, my classroom management skills improved greatly. Additionally, my development both with managing the daily processes within the classroom and planning and delivering effective lessons and assessments directly impacted the academic gains of my students .Overall experience was very good thanks to my mentors who were always there to help me

Learning Outcome: Learned about the manufacturing of cement along with the machinery used in a power plant and how to minimize the heat loss in a raw mill power plant

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PS-I station: AECOM Infrastructure-Civil , Mumbai

Student

Name: ATHARVA DINESH GAIKWAD . (2019A2PS0782P)

Student Write-up

Short Summary of work done: I studied the Mumbai Trans Harbour Link. I studied the natural conditions data, Preliminary Design reports, Construction Methodology and the Construction Planning regarding the MTHL.

PS-I experience: It was a good learning experience. My mentor was efficient at providing the neccecary data and report regarding the project.

Learning Outcome: Fundamentals of Foundation Engineering, Fundamentals of Bridge engineering, Construction Methodology and Planning.

Name: ARADHYA SINGH . (2019A2PS0801P)

Student Write-up

Short Summary of work done: I did beam analysis using STAAD.Pro in the first half of the project. In the latter half, I reviewed IRC:6-2017 and used MIDAS Civil to model a simplified Composite-T girder bridge. Self weight, wind load and live load were applied according to IRC: 6 and their effects on the bridge in the form of bending moment, shear force, etc. were found using MIDAS Civil.

PS-I experience: It was pretty good. I got to learn a few things about bridge design that aren't taught in the academic curriculum.

Learning Outcome: I learned how to use STAAD.Pro and MIDAS Civil, both of which were completely new to me. I also learned some concepts that are used in bridge design.

Name: YASH DIXIT . (2019A2PS0865P)

Student Write-up

Short Summary of work done: I learned about the Structural and Geotechnical aspects of UG Pune Metro tunnel construction and Metro Station. Analyzed and understood the design of structures from the documents provided to me by industry mentor which helped me in gaining an in-depth knowledge about the subject.

PS-I experience: It was a great learning trip. Since, no projects were assigned, I got familiarized with the documentation used and analyzed in the industry. I got the opportunity to refine my presentation and communication skills.

Learning Outcome: I learned about the Underground Metro construction as it will plays an important role in the transportation sector as well as forms an important part of smart city like Pune.

PS-I station: Amritha Tool Crafts-Computer science , Hyderabad

Student

Name: AKSHAT SINGH . (2019A7PS0074P)

Student Write-up

Short Summary of work done: Develop a software which can be used by the company to schedule its work.

PS-I experience: A good learning and enriching experience.

Learning Outcome: Improved technical skills, new friends.

Name: ARYAMAN KRISHNA VELAMPALLI . (2019A7PS0140H)

Student Write-up

Short Summary of work done: Amritha Tool Crafts manufactures moulds for different products. It has several machines (resources) used for this purpose such as milling machine, turning machine, etc. Preparation of a mould consists of a sequence of activities, each activity consuming a certain number of hours of a resource. We developed a software to create a macro level schedule based on the moulds to be prepared, the activities involved for each mould, resources needed for each activity and the priority of moulds to be prepared. This schedule would help the management better understand the timelines and enable them to commit realistic delivery dates to the customers.

PS-I experience: I gained invaluable knowledge working at Amritha Tool Crafts, Hyderabad. I got a thorough insight into the scheduling of mould making processes and the variety of machines available to carry out the production. I received extensive help from my PS-1 Faculty Professor Mukesh Kumar Rohil. He constantly gave reviews of our work and offered his insights to our problems. He also gave us access to multiple resources to study which helped us expand our understanding of the problem. Mr.Pardha Saradhi Pal, our mentor from the PS Station was always reachable to us and offered us a lot of help in understanding the project requirements. He consistently set up meetings with our team, reviewed our progress on the project and suggested changes to make.
Pursuing my PS-1 at Amritha Tool Crafts has helped me learn a lot of new things and gain a grip over the Python programming language. It was a fresh experience to be part of a company and know how work in the industry will feel like. A fun and knowledgeable experience indeed!

Learning Outcome: This project gives an overview of how planning software works, how scheduling may broadly be defined as the allocation of resources to tasks over time in such a way that a predefined performance measure is optimized. From the viewpoint of production scheduling, the resources and tasks are commonly referred to as machines and jobs and the commonly used performance measure is the completion times of jobs.
I learnt how to satisfy various constraints like the number of working hours in a day, accommodating off-days and holidays, maintaining the relative order of the processes of a part and many more. Moreover, this project has also exposed me to Jupyter notebooks and its wonderful libraries like NumPy and Pandas showing how easily data can be handled and manipulated. Pyomo library has given me great experience in solving linear optimization and constraint satisfaction problems.

Name: M S VENKATA NARASIMHA HRISHIKESH (2019A7PS0152G)

Student Write-up

Short Summary of work done: Amritha Tools Crafts is a manufacturing company that makes molds at a large scale. The mold making process has a lot of processes that have to be scheduled and a lot of resources that need to be allocated. To help them in this process, they have asked the students to develop a software that takes in inputs as excel files and gives a detailed schedule that isn' too complex and can be used by everyone.

PS-I experience: PS1 was a great experience as it gave a wonderful insight into how a manufacturing company works along with general work place ethics. This was a really enriching experience which would not have been possible without BITS and the PS Division

Learning Outcome: 1. How to use python and it's libraries in software development
2. Linear Programming and Constraint Satisfaction Problem Solving
3. NP Hardness of problems and how to overcome NP Hardness
4. How a Manufacturing company produces molds at a large scale

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PS-I station: Amritha Tool Crafts-Mechanical , Hyderabad

Student

Name: MONDRETI SRI LEKHA . (2019A4PS0783H)

Student Write-up

Short Summary of work done: Made a Data Visualization tool (to integrate with scheduling software that gives us an output of the schedule of operations on machines at the company) using Pandas, Plotly and Matplotlib, which could extract data from an excel or .csv file and visualize it as a Gantt Chart.

PS-I experience: It was a nice experience. Our industry mentor was quite supportive and has always been ready to schedule a meeting whenever we asked him to. The quality of the project given was good. Our faculty mentor from BITS has been very helpful and organized meets on weekdays to check up on the progress and suggest improvements. Via the experience of PS-1, I learned multiple soft skills along with exposure to Python programming and some of its libraries, and Data Visualization.

Learning Outcome: Various Domains of Python Programming and Data Visualization using different libraries like Pandas, Plotly and Matplotlib.

PS-I station: Army Base Workshop - App/AR/VR , Pitoragarh

Student

Name: KSHITIJ GUPTA . (2019A3PS0212P)

Student Write-up

Short Summary of work done: I had started our project to learn about databases and their workings to create a project prototype. GitHub was chosen as the working platform to edit, save the source code, and I used VS code to run and save the changes. I have used Flask web framework, SQLite and learned about them individually in the process of developing the application. The inventory data could be stored in an encrypted SQLite Database and can be accessed only by authenticated users. I have implemented cron jobs, which would work in the background. These cron functions would notify the connected devices once the threshold date has been reached. I have even used HTML and CSS, Javascript to create the website and familiarise ourselves with them by doing some small projects. I have made a Flask web application that could be locally hosted on the LAN at the local server present at the Army Base. I have created a login ID system to login into the website and have saved the valid user credentials in the source code. Data related to inventory can be manually fed or removed by the authenticated users and for notifications related to worn out/expired products. Anyone can view the product summary, description, logistics history, and station location on different website pages.

PS-I experience: PS-1 experience was overall a good experience .Though being a work from home PS, it didn't affect the flow of the PS and evaluation components. The quality

of the project given was fine. Also I got to work with wonderful mentor who helped me learn relevant things for the project and guided me throughout the PS-1.

Learning Outcome: I got to learn about many different technologies and software such as Python, HTML, Git, Github, Flask, VS Code. This helped me understand the requirement and utility of each one in the project. Apart from this I also got to learn about how the organisation functions and team coordinates on different projects.

Name: RAY SUYASH PRASAD . (2019A8PS0401P)

Student Write-up

Short Summary of work done: The main objective of our project was to build a platform/application which can receive, amend and sign the received orders by concerned officers and send the reply to the concerned authorities. The application can also maintain a digital ledger, schedule the popups and reminders. The app also keeps track of inventory, spare parts, vehicles etc. in a digital ledger.

PS-I experience: The PS-I experience was very valuable to me. I came to know the difference between academic knowledge and practical application of it in IT industry. PS-I allowed me to sharpen my skills by allowing me to work in the real world environment beyond the classrooms.
The complete application development process was a very informative and enriching experience for me. This was my first experience to work remotely and with professionals. The webinars conducted during the PS period made me aware of industry norms and practices which helped me to prepare myself for future challenges.

Learning Outcome: We learnt about Flask (Web Framework) and SQL (database computer language).
We also learned about HTML (Markup Language) and CSS(Style Sheet Language). We came to know about the various steps to follow while developing an application. We learned how to debug and test an application so that it works under all possible scenarios. We learned how to work remotely from home in an online environment and maintain a professional conduct throughout the same. We also learnt about the art of Collaboration with our teammates and as well as with PS Faculty and Industry Mentor.

PS-I station: Army Base Workshop - Electrical Power Systems , Pitoragarh

Student

Name: Saksham Jain (2019B3A30160P)

Student Write-up

Short Summary of work done: Our team of four had to fabricate an electric all-terrain vehicle (Four-wheel ATV) from scratch. We covered up all the background work required before running software simulations of various drivetrain systems. We studied deep about the construction, working and performance of all the motors and batteries available in the market, compared among them and chose the best variants suiting our needs. The vehicle had a utility in Himalayan regions at a height of at least 18000 ft, at temperatures as low as -40 degree Celsius, and climbing steep hills at 60 degrees angle. We were also required to maintain a payload of at least 200 kg and a capacity for two people. The team also studied motor controllers, BMS, Throttle, Regenarative Braking, battery thermal management and more. We referred to 30+ research papers varying from motors, chassis, batteries, BMS, Thermals, Regenarative Braking, Insulation and all other theories.

PS-I experience: The project and the station were great, and the officers used to help us in making decisions while comparison. They guided our studies in insulation and thermal management as our team had only electronics students. They allowed us to explore and learn everything in our own pace.

Learning Outcome: I learned the working of 6+ motors and 5+ batteries; various methods of ventilation for maintaining motor temperature; various methods and materials used for battery insulation for low temperature compatibility; Regenarative Braking technique for battery recharging while in motion; working of a BMS, motor controller and throttle. This knowledge will aid me in research on power electronics and autonomous vehicles.

PS-I station: Army Base Workshop - Industrial Automation & Control , Pitoragarh

Student

Name: BANNURU VEERA SIDDHARTHA . (2019A8PS0434H)

Student Write-up

Short Summary of work done: Our project was to design an unmanned wireless video surveillance system to monitor the border area.

PS-I experience: It was nice and informative.

Learning Outcome: Learned about security systems and different cameras and telemetry systems. And also improved communication skills and presentation skills

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Name: MHAPSEKAR KAUSHAL SHEKHAR (2019AAPS0188G)

Student Write-up

Short Summary of work done: My work at the PS station was project based. I along with 3 other students had to design a low cost unmanned remote video surveillance system which met the requirements and specifications provided by Army Base Workshop. We divided the surveillance system into 3 parts - Camera, Power Supply & Communications and started working on them.
We first spoke with the Industry mentor from Army Base Workshop and understood the importance and relevance of our project. We also got to know about the geographical and climatic challenges faced by them that we needed to consider in our project.

After this we immediately started researching about the working of military-grade CCTV Cameras, their features and latest technologies and shortlisted the cameras that suited our requirements. We then started making enquiries and asking for quotations.
We then started working on Power Supply, for which we started with Solar Power systems as these can generate power independently at low cost and maintenance. But due to the geographical limitations, we had to look for other alternatives and we decided to use custom battery packs that would work at very low temperatures.
Finally, we worked on the Communications/Transmission part. At first we were thinking of using point to point antenna communication, but due to the mountainous terrain which would cause obstacles in communication we decided to use a LoRaWAN (Long Range Wide Area Network) based system instead.

PS-I experience: A good learning experience and an opportunity to work on practical engineering applications.

Learning Outcome: 1) Technical Knowledge about CCTV cameras, solar power systems, battery packs and Communication devices.
2) Ability to solve practical challenges and find solutions.
3) Professional Communication skills.
4) Reading spec sheets, brochures for relevant information and managing researched data.

Name: TANMAY FULARA . (2019B4A30611P)

Student Write-up

Short Summary of work done: Military personnel as well as the civilians residing in remote areas like high altitude mountain terrains almost always experience low mobile signal/network reception. Consequently, the communication is drastically affected. Relaying of ordinary messages among the army or civilians either consumes a lot of time or is possible only between certain specific locations.
The project aims to achieve its goals by installing receiver antenna at the required low

signal strength area to capture the low strength signal, positioning a signal amplifier of required power at an optimum distance from the antenna and finally positioning a re-transmitter antenna at a certain distance from the amplifier for the re-transmission of the amplified signal.

PS-I experience: It was an immense learning experience while preparing the project. We got the opportunity to explore different disciplines involved in the project.

Learning Outcome: We studied the different types of antennas and their radiation pattern characteristics involved in determining their feasibility in doing various tasks and operations. We observed the radiation pattern of omnidirectional antenna and directional antenna in more detail through HFSS simulation.

Name: NITHYASREE P G . (2019B5A31112H)

Student Write-up

Short Summary of work done: My group was assigned the task of fabricating a Network Booster to be installed at a low signal area for communication in areas of poor network reception.

PS-I experience: PS-1 experience was great in that there was remote coordination among group members, discussions on advantages and flaws in the ideas and methods proposed by members, assessment of technical issues of the device etc.

Learning Outcome: Learning outcomes included basic theory of digital signal processing, working of antenna and amplification of signals. I also learnt professional skills of presenting an idea to a group, discussing and working in a team to achieve a final goal.

PS-I station: Army Base Workshop - Machine Learning , Pitoragarh

Student

Name: ABHIJITH S RAJ (2019A7PS0055P)

Student Write-up

Short Summary of work done: My work involved reading research papers and coming up with new machine learning models for moving object detection on aerial drones and UAVs developed in-house by the Army Workshop.

PS-I experience: Overall, it was a very good experience. I got to work with students from all the three campuses of BITS.

Learning Outcome: I learnt about working with multiple people towards a single goal. It lead to an improvement in my communication skills and also taught me how to read research papers.

Name: BHARGAVA TEJA UPPULURI (2019A8PS1279H)

Student Write-up

Short Summary of work done: Used Computer Vision and Machine Learning to help in motion analysis in drones developed and designed in-house by the army base workshop.

PS-I experience: It was good. The faculty was a CS faculty so he helped us wherever needed. The Army officers are busy at times but will help whenever you need them to.

Learning Outcome: I learnt how to research papers and apply research in real time industrial applications. Also learnt how to overcome industrial application issues. I gained a lot of knowledge in the field of ML and CV.

Name: ADITYA CHORARIA . (2019B1A70734P)

Student Write-up

Short Summary of work done: We were given the task of improving a drone. We had to make a model using ML/DL which could identify stationary and moving objects. Most of our work was based on the OpenCV library.

PS-I experience: It was a good experience. It made me realize the importance of data in Machine Learning and how difficult it becomes to train a model without a lot of data.

Learning Outcome: I learned about CNNs, transfer learning, OpenCV and some algorithms like Motion Compensation, Panorama background subtraction, etc.

Name: S V SHANMUGHA BALAN . (2019B5A30571P)

Student Write-up

Short Summary of work done: We had to develop an application to pinpoint the location of army equipment on a map and to provide notifications if any of the equipment needed servicing.

PS-I experience: PS-I was a very different experience from what I expected it to be. It was a welcome change compared to the monotony of the pandemic and it was quite an

interesting idea to learn something rather different from the usual curriculum and the topic for which I applied for this station. I feel more ready to take on the world having seen what an actual work related role for an organization looks like. The instructors were pleasant and friendly, we had no pressure whatsoever.

Learning Outcome: I learned app development using Flutter and brushed up on my knowledge of SWE concepts.

Name: SNEHASISH KUMAR SHARMAH THAKUR . (2019B5A70411G)

Student Write-up

Short Summary of work done: Problem statement was to track the location of equipment, store their service dates in a database, depending upon expected next service date send notifications to the operators in charge, find secure communication technology and integrate the entire process in a single platform with easy interactive interface. We researched about the different communication technologies and sensors which may be implemented depending upon security, error tolerable, field area, etc. Next we implemented a MySQL database with MySQL for Excel interface for ease of access. Data stored related to real time location and service dates. We also planned how a Flutter based application may read data from this database and send out notifications. We planned how the various components would interact and a flowchart to represent the data flow. Finally we planned on representing the location coordinates on Google Maps API for easy readability. We also researched about methods to increase the security of the process, cloud hosting of the database and automating the prediction of the next service date.

PS-I experience: The experience included understanding the needs of the army base, understanding limitations such as poor connectivity in certain regions and trying to search for technologies to solve them. The data that would finally be used was confidential so we were asked to use dummy data, respecting such confidentiality was an important learning as well. The experience helped me learn new technologies, working in a team and improve my communication skills.

Learning Outcome: I learnt how field data may be communicated to a central database, the importance of security in such communication and possible implementations , how

the data may be stored in a database, read by another application, edited through a user friendly interface, represented on google maps and how the data may be read and notifications may be sent out on the basis of it. I also gained introductory level learning about location technology, MySQL, Flutter and Google Maps API.

Name: TANISHQ HARISH DUHAN . (2019B5A70636P)

Student Write-up

Short Summary of work done: Development of Equvipment tracking and mapping systems

PS-I experience: Good

Learning Outcome: Learnt about Flutter, SQL and some hardware.

PS-I station: Awarpur Cement Works-Electrical & Electronics , Chandrapur

Student

Name: MAUNIL CHOPRA (2019B5A80781P)

Student Write-up

Short Summary of work done: I studied various methods to control the speed of a process fan in Awarpur Industry. I also learned about various types of motors in general.

PS-I experience: It was a wonderful experience.

Learning Outcome: Learnt about various methods of speed control in a cement industry. Learned that in an industry communication skills are very crucial and sometimes even more than the technical skills.

PS-I station: Baga Cement Works-Chemical , Solan

Student

Name: ADITYA AMIYA PANDA . (2019B1A10910G)

Student Write-up

Short Summary of work done: We learnt about the cement manufacturing process in detail. We also learnt about the use of additives in the cement industry and their impacts on the production process and cement strength.

PS-I experience: We learnt the above mentioned things in detail. We also had group discussions, seminars and literature reviews from time to time.

Learning Outcome: We learnt about the abovementioned topics and understood concepts such as clinker, setting time, etc.

PS-I station: Baga Cement Works-Civil , Solan

Student

Name: PADARTI BHANU TEJA . (2019B3A20418P)

Student Write-up

Short Summary of work done: We have mainly worked on the cost estimations of road and colony maintenance. And also got to know about the cement manufacturing process as well. we also worked on the rainwater harvesting techniques that were being implemented at BAGA CEMENT WORKS.

PS-I experience: I can say this PS-1 is like an information gathering period for me, from our work and the very useful PS-1 webinars. It would be even better if the recordings of those PS-1 webinars is also available.

Learning Outcome: Learnt, how actually the cost estimations will be done for a particular project. Also learned about the cement manufacturing processes and some rainwater harvesting techniques.

PS-I station: Baga Cement Works-Electrical & Electronics , Solan

Student

Name: JASREET KAUR BHEORA . (2019A3PS0421H)

Student Write-up

Short Summary of work done: My project was related to automation of water pumping stations at site. Being in a virtual environment, it was difficult to get an idea about the real time situation at the station and work accordingly. Although, I learnt about cement manufacturing process, the equipment involved and GSM based module for wireless communication. I studied about feasibility of automating the water pumps at the station and optimizing them without the help of middlemen.

PS-I experience: The experience was good and having done PS-I improved my interpersonal communication skills. My industry mentor was quite busy so he could not help and guide me thoroughly about the plant and my project, although he tried his best.

Learning Outcome: The overall learning outcome was decent. I learnt about cement manufacturing process and the equipment involved. I also studied about GSM based modules involved in wireless communication.

Name: SAKSHI PANDITA . (2019A8PS0367P)

Student Write-up

Short Summary of work done: The project assigned to me was 'Plant CCTV on wireless systems' . In this project, I had to make a proposal as to how the wireless configuration of CCTV will take place. Presently, the station is using OFC connected CCTV cameras but the cables very often get damaged due to harsh weather conditions. So, the station wants to switch to wireless CCTVs . For this , the master-slave configuration has been used in the proposal . The project report also briefly discusses about the wireless technologies.

PS-I experience: Earlier, due to lack of communication with the PS station , the project started a bit late . But on the other hand, all the evaluatives were conducted smoothly and on time. I gained a few notches in my presentation skills through the seminars. At the same time, the group discussion helped me improve my GD skills. Overall, the experience was good.

Learning Outcome: Although , there were few hard skills that I learned in the project but the PS-1 did help me improve in my presentation skills, GD skills and I learned about wireless technologies .

PS-I station: Bajaj Auto Limited , Pune

Student

Name: GAWANDE SANKALP SUBHASH . (2019A4PS0159P)

Student Write-up

Short Summary of work done: Zero based costing of tyres incorporates all the manufacturing processes of the tyres and makes an attempt to gain the final tyre cost estimation by following the bottom-up approach. Tyre being a proprietary component, there are limitations to the data freely available in the manufacturing of different models. The said project, 'Zero based costing of bias two wheeler tyres' attempts to formulate a template of tyre costing wherein inputting a certain number of derivable variables would lead you up to the estimated cost of the tyre directly. This template enables one to directly get a prospective cost of required bias tyre with minimal effort and is not based on the consideration of a reference tyre being appropriately priced but has all the prices incorporated with logical considerations.

PS-I experience: The overall experience was a pleasing one. We had an onboarding procedure followed immediately at the start of our PS-I program. After waiting for few days, we were allotted projects in our interest areas and were monitored effectively while completion, by the industry mentors. In my experience, I had meets with my industry mentor almost every working day with my industry mentor who ably guided me to sail through the project by solving any issues I faced. I was able to finish my work with a practical solution to a problem posed to me made available in working condition which can be used as and when required in the industry. I'm glad I was a part of this PS station specifically.

Learning Outcome: My learning outcomes include the complete technological processes involved in tyre manufacturing industry. I'm now even able to practically go out and look for tyre markings on any vehicle tyres and can understand what exactly they mean. Apart from this, I have also improved my technical, interpersonal and communication skills with the number of evaluative components which were focused on the same, and my work in the industry which required the same. I have also come to understand the working of an organization from the inside and would definitely thrive better in any of my work opportunities ahead with the knowledge I have gained.

Name: VEDANT JASU (2019A4PS0320P)

Student Write-up

Short Summary of work done: My project was "Thermal shock cycle testing in liquid cooled engines". I read about the cooling system in automobiles, and how the thermal shock cycle test is important for the engine. I was asked to find research papers related to the testing, and I found some related to the testing's simulation. I also developed a layout of the testing, and discussed it with my mentor for changes. Calculations related to the heater and cooler requirements was also discussed.

PS-I experience: It was really enriching to get corporate exposure and some idea about core mechanical work before my third year started. It was a new experience to interact with different industry experts and understand how work is done in the industry.

Learning Outcome: I learnt a lot about thermal shock cycle testing. Apart from that, corporate communication and going through so many research papers were my biggest learning outcomes.

Name: VINAYAK KAPOOR . (2019A4PS0402P)

Student Write-up

Short Summary of work done: 1). I was provided with the actual testing data of 2 models of the Bajaj Triumph engine. I had to calculate the heat rejection curves, engine burn durations and thermal efficiencies for various RPMs.
2). I was supposed to create a web app using django for storing, accessing and meaningfully presenting the engine data provided. This system was supposed to help in comparing different engine parameters and generating reports.

PS-I experience: It was a good learning experience. Bajaj being a very new PS1 station, we faced a few difficulties at the beginning regarding project allocation. But all the issues were handled well by the Bajaj HR team. My industry mentor had over a decade long experience in the R&D industry and was approachable. He was keen to help out and an effective problem solver as well. It was a good learning experience.

Learning Outcome: I gained a lot of knowledge about the working of the internal combustion engine and the django framework. It was a great industry experience as I was able to actually see which parameters differed in actual practice as compared to what we study in the books. I also learnt mathematical modelling in MATLAB, Python and Excel.

Name: GODDANTI AJAY BALAJI . (2019A4PS0463H)

Student Write-up

Short Summary of work done: My Project is develop a methodology for roundness/cylindricity inclusion in slip calculations and find an alternative 1-D calculation. Usually there are predefines formulae to solve the axisymmetric problems. My work is to include the errors like roundness and cylindricity in those formulae and observe the behaviour of the stress interaction in interference fit. I should develop a 1D-calculation model using MATLAB and Python and validate the results of FEA simulations in Ansys.

PS-I experience: I had a wonderful experience in my PS-1 program. I was treated like an employee in the company. Daily interaction with the industry mentor in Microsoft teams. They encouraged and supported me to learn the relevant technical concepts and skills. They Allotted very interesting project to me, so that I acquired some knowledge that helps in my career. They awarded stipend for this Internship. Finally this station helped me to experience the work culture in the corporate automotive company.

Learning Outcome: My learning outcomes of this PS-1 were very Important in my core career. Technical skills like MATLAB, Python, CAD modelling and FEA simulations using Ansys. Apart from the technical skills I also developed some communication and soft skills like participating in group discussions, giving seminars, team work and coordination with higher officials.

Name: MITESH KATARIYA (2019A4PS0531P)

Student Write-up

Short Summary of work done: I worked in the Materials division of the Research and Development department, Bajaj Auto Limited, Pune. My project title was "Light Weighting of Electric Vehicle", which was a study-type (research-based) project. I was guided by my industry mentor Mr. Sandesh L Sawant. My main objective was to focus on the materials aspect of vehicles. The evolution of automotive materials till date, contemporary materials used, need for light-weighting, benefits of light-weighting, different strategies of light-weighting and case studies were the major components of my project. I understood how materials are the most significant element of an automobile and how they can be used for light-weighting vehicles. Why and how light-weighting should be carried out was the basis of my research. As far as the evaluative components were concerned, I participated in two group discussions and two seminars. The first group discussion was on the Future of Electric Vehicles: Global and Indian scenario and the other, on Edge and Cloud computing in Mechanical Industry. The seminar-1 was on Failure Modes and Effects Analysis, and the other was on my main project. I worked sincerely during these components, which helped me grasp new concepts of great significance. Overall, I enjoyed the work during the complete PS-1 program.

PS-I experience: This program took me from reel to the real world, that is, from imagination to application. It proved to be a great experience due to a variety of reasons. Firstly, the support and insights from our BITS faculty Dr. Ganesh M Bapat proved to be very helpful throughout the PS-1 program. The evaluative components like the group discussions, seminars and reports were instrumental in providing me with a memorable academic experience. Though there is the delay in allotment of the project, the PS-1 program being in online mode has given the flavour of industry and understood the importance of communication. It was overall a very good learning curve for me.

Learning Outcome: I learned how soft skills like communication, teamwork, patience and confidence are as important as technical skills for successfully pursuing any endeavour. I learned how research is carried out and how academic reports are written. I improved upon my presentation skills as well as interpersonal skills. I also got to know about materials used in the automotive industry, the significance and application of concepts like failure modes and effects analysis, edge computing and cloud computing. I learned more about electric vehicles and their future scope, along with the current trends and the attempts of the automotive industry to tackle the problems of today and meet the demands of the future.

Name: KUSHAGRA PIPRAIYA . (2019A4PS0540P)

Student Write-up

Short Summary of work done: My project was a research oriented project on various automotive sensors, their working principle, cost, electro-mechanical interface, etc. I had to research on sensors which were mostly related to the autonomous driving aspect and industry 4.0, and Bajaj is not currently utilizing them. The work focused on preparing a report on these sensors and how Bajaj could utilize them in the future.

PS-I experience: It was an enriching experience, even in an online format. My industry mentor was really supportive. College played an amazing role by arranging so many industry expert sessions which widened my perspective towards the upcoming new technologies.

Learning Outcome: Learned how the industry works in reality, how to have formal discussions and prepare presentations with the colleagues. Got to know the tremendous amount of effort that goes into making even the smallest of changes in products.

Name: BAKHSHI MEHUL . (2019A4PS0670G)

Student Write-up

Short Summary of work done: My project was related to the roles on SLA in Investment Casting. I did research from various scholarly articles on casting, investment casting, SLA and roles of SLA in IC. Different aspects of the processes were compared and the regions where development is needed were identified. As well as the process was compared with other additive manufacturing methods.

PS-I experience: PS-1 program was helpful to get familiar with various kinds of fields and opportunities in the industry. The experience at Bajaj Auto was gratifying. The company is very professional and the experience majorly depends on the mentor allotted.

Learning Outcome: I learned about SLA, SLS, DMLS, FDM and investment casting. As well as developed communication skills.

Name: ABHIGYA SINGH . (2019ABPS0637P)

Student Write-up

Short Summary of work done: I was allotted the project "Prediction of Noble Metal Loading of a Catalyst in a Spark Ignited Engine". With increasing awareness about environmental pollution, the emission norms which mandate vehicles to uphold certain emission regulations are getting more stringent. This project dealt with gasoline-run 4-stroke engines and the emission parameters associated with such engines. A majority of the emissions are emitted from the exhaust valve of the engine and, hence, studying exhaust emissions was the primary objective of this project. The carbon monoxide, nitrogen oxides, and hydrocarbons that are present in engine emissions must be subjected to treatment. Catalytic treatment using platinum, palladium, or rhodium is the most sought after method for doing so. However, the high cost of these noble metal catalysts poses a challenge for manufacturers. This project was an attempt to study the parameters on which engine emissions are based and then optimise these in order to achieve high engine performance and efficient emission treatment.

PS-I experience: PS-1 was a fruitful learning experience for me. The numerous group discussions, seminars, and presentations provided incredible insights into the mechanical industry. The seminars organised by PSD featured some of the leading professionals in the industry and were extremely informative. The most valuable lessons I learnt were from the interactions that I had with my industry mentor about the work practices in a leading automobile manufacturer. This exposure will certainly help me make informed decisions about my career.

Learning Outcome: I was able to apply the lessons that I had learnt from my CDCs, particularly Mechanisms and Machines. I learnt about the different emission norms and treatments which are applied in the automobile industry. Some of the soft skills that I developed would be time management, effective communication skills, and public speaking.

Name: GURSHER AUJLA . (2019B2A40961P)

Student Write-up

Short Summary of work done: The title of my project was 'Design guideline and selection methodology of precious metals (Pd, Pt, and Rh and its ratio) and wash coat formulation for emission optimization of gasoline engine catalytic converter.' It involved optimizing the PGM (Platinum Group Metal) ratios & loading of a dual brick catalyst system, focussing on reducing the costs of these converters without sacrificing performance and still being in line with the new BS VI emission standards. During the course of the project, I studied and examined the various parameters such as washcoat composition, PGM loading, and substrate design in relation to the three-way catalyst (TWC) performance, especially the low-temperature activation performance, focusing more on recently published work. In addition, the effect of these parameters with regard to the conversion efficiency of carbon monoxide, unburned hydrocarbons, and nitrogen oxides pollutants was also studied.

PS-I experience: The mentorship and guidance extended by the industrial house and the PS-I faculty were outstanding in all spheres. The program allowed me to gain a tremendous amount of professional experience. Some of the domain-specific industry sessions organized by the Practice School Division helped me learn about new software along with their applications and gave me a glimpse into the core industrial jobs in the Automotive, Design, and Manufacturing sectors. Overall, it was a great learning experience.

Learning Outcome: The entire exercise has been instrumental in shaping my professional outlook and functional ethos in a sublime manner. My project on the Catalytic converter taught me the nuances of research and literature survey related to a topic at the micro & macro level. Moreover, the exposure enabled me to get a congruous insight into the corporate dynamics, particularly when associated with a top-notch company like

Bajaj Auto Ltd. The PS-I program certainly helped me improve my communication and presentation skills as well.

Name: BHAVYA SHANDILYA . (2019B5A80753P)

Student Write-up

Short Summary of work done: I was allotted a project in Bajaj Auto R & D. The project is to develop a machine learning tool to classify bikes' exhaust sounds that can be further extended to customer response also. The cycle started from doing a literature survey, then to classify different ML approaches and collecting sound samples of various bikes available in the market ranging from 50k to 30 lakh. After that, I have to develop a sound classification model that distinguishes bikes into sporty, cruiser, budget categories by taking into account 10-15 different parameters. Overall the project was very interesting, the rewards were great and the mentors were helpful and experienced.

PS-I experience: I really enjoyed the PS-1 project in Bajaj Auto. I was interested in doing some real work and the R & D project was perfectly suited for that. I developed both technical and personal skills during my project. I also made good connections with people in the company and in my station. I would recommend the station to anyone interested in mechanical or non-mechanical projects. Bajaj being a multi billion dollar MNC provides the feel of working in a big company. Overall I liked the project and station and I thank PSD for providing me this opportunity .

Learning Outcome: I dived and learned about machine learning and specifically its use in sound classification. I also learned how work goes in a MNC and what are the different levels of work in Research and Development. I gained technical knowledge in python and cad software. I also developed an understanding of what parameters effect sound of exhaust like engine, material, cylinders and coating. Apart from this, I also gained organizational skills like team work, collaboration, time management and discussions. I developed good communication skills as I have to interact with my industry mentors and HR managers.

Name: BHAVYA SHANDILYA . (2019B5A80753P)

Student Write-up

Short Summary of work done: I worked on a project titled 'Exhaust sound quality classification using machine learning'. The work involved-
1.Doing literature survey of various techniques that can be used in audio classification
2.Collecting exhaust sound samples of motorbikes available in India
3.Performing trimming and editing of sound files
4.Writing python code to convert mp3 files into wav and then plotting the spectrogram using matplotlib.
5. Applying neural networks to extract feature maps from the images. Training model
6. Using K-means clustering and PCA algorithm to cluster and plot data-points on a graph.
7. Extending the classification into more categories and customer study.
The project was very engaging and the I gained good amount of knowledge and skills from it. I used latest technologies like deep learning and ML in python and I got to implement my previous knowledge on a hands on project. Moreover, Bajaj provided a lot of other incentives like a sufficient stipend, access to Bajaj's events and an opportunity to work with the company in future.

PS-I experience: I really enjoyed my PS-1 work. It is a very interesting project. I got the opportunity to work with research engineer and managers from the R&D of Bajaj, and the whole team was very interactive. I learnt some cutting edge AI and ML tools like CNN, spectrogram study, PCA and K-means algorithm and linear regression in Python. I learnt various libraries like panda, NumPy, matplotlib, skit-learn, etc. I also got to know the working of an MNC from inside.
Overall, I had a wonderful time working with Bajaj Auto.

Learning Outcome: In terms of learning outcome, PS-1 was a very enriching experience. I learnt team working skills, leadership, formal communication in a company, process of research and development, time management and patience. Apart from the technical skills that I mentioned, I also developed interpersonal skills like coordination, perseverance, healthy discussions and openness to constructive criticism.

PS-I station: Balaji Cement Works-Chemical , Budawada

Student

Name: H MANIKANDAN . (2019B4A10781G)

Student Write-up

Short Summary of work done: My project was to reduce specific energy consumed in the cement grinding process by improving the operational efficiency of the roller press ball mill combination and vertical roller mill. First, I had to learn about the cement grinding process and about the functionality of the mills mentioned above. Using this information, I tried to locate the processes which were very energy intensive and suggest ways to optimize the process. For the roller press ball mill combination, I observed that the circuit used could drastically affect the power consumption and also the quality of the cement produced. For the vertical roller mill most of the power consumption came from the properties of the raw material fed into the mill. By optimizing various characteristics of the material like size, moisture content and hardness, it was shown to lead to noticeable power saving.

PS-I experience: Overall PS-1 was a great experience. My sincere thanks to my PS-1 instructor and my mentor from Balaji Cement works for their continued support and guidance throughout the period of my study.

Learning Outcome: I got to experience the inner workings of a large cement manufacturing plant and the various machines and processes used. I learnt a lot about cement grinding and the various mill used for this purpose.

PS-I station: Balaji Cement Works-Civil , Budawada

Student

Name: AKSHITH KRISHNA ADEPU . (2019A2PS1523H)

Student Write-up

Short Summary of work done: We learned about the ground working of the cement plant, how the management system is there in the cement plant. Our project is based on Rain water Harvesting sytem for the residential society and the cement plants, we learned about the different kind of systems of rain water harvesting, the ground workings, challenges faced by the rain water harvesting systems. we are asked to design the suitable rainwater harvesting system based on the topographical data available. Our major roles were as a researcher, learner.

PS-I experience: The online mode made us difficult in experiencing the real joy of working in the cement plant, but it made me a strong researcher, a good presentator. The effort put by our faculty members to made us learn made our PS - 1 special, they ensured to make us work and learn with joy.

Learning Outcome: It made me a good researcher, good presentator

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PS-I station: Balaji Cement Works-Electrical & Electronics , Budawada

Student

Name: ARINDAM BANDI . (2019B5A80258G)

Student Write-up

Short Summary of work done: Worked on weighbridge rfid automation. Which is to basically auto mate the process of identification and weighing an industrail vehicle incoming or outgoing the induatrial premises.
The work was to identify what type of rfid system and weighbridge is required to the company.

PS-I experience: It was not too good not too bad since it was online.

Learning Outcome: I learned a lot about rfid systems and weighbridges and the practicalities of working in an industry.

PS-I station: Birla Polyfibers-Chemical , Harihar

Student

Name: CHUNCHU SAI VIVEK . (2019A1PS0724P)

Student Write-up

Short Summary of work done: Our objective of the project is to study the mass and heat balance of conversion of green liquor to white liquor and maximize it's conversion efficiency.

PS-I experience: Working with an industry professional helped me a lot to know more about the working of a chemical industry and what are the main processes involved and how they carry out them with maximum efficiency. The overall experience was good. Lack of physical access to industry was a problem though.

Learning Outcome: I developed and enhanced skills (technical as well as soft skills) such as

1. I got to know the theoretical knowledge of machinery, techniques and research done in an industry.
2. Complete understanding of pulp processing.
3. Efficiency in communication and quality of research needed.
4. MS Office (Documentation & Presentation).
5. Communication and GD skills.

Name: MALLADI SAI GOPALA KOUSHIK . (2019A1PS0766P)

Student Write-up

Short Summary of work done: We had to study about white liquor and green liquor how they are converted and how to increase the efficiency of the conversion.

PS-I experience: There was very less interaction with the industry mentor, would have better if it was offline but nonetheless it was great experience, I had a Complete understanding of pulp processing, also developed some communication skills.

Learning Outcome: I got to know about how industry works and and about our project which was very interesting and we had some good group discussion.

Name: DHARANI AMARAM . (2019B1A11465H)

Student Write-up

Short Summary of work done: My project was in the the domain of process development in the wood pulp manufacturing unit. It was a project taken up by the industry to meet their goals of sustainability and energy conservation. After our formal orientation we had to present a basic idea of how we can go about the project and discuss our ideas for the future. We had interactive sessions with our team members, our PS faculty and our Industry mentor. The Expert Lectures throughout PS -1 have been informative and helpful for the project as well.

PS-I experience: I had an opportunity to interact with people from various domains. Communication through online modes was challenging but a different experience among all. An abundance of knowledge and experience was gained from researching for this project.

Learning Outcome: My main outputs from this project would be communication skills, presentation skills, and interacting with people from various domains. Overall it has been a fruitful experience.

PS-I station: Birla Polyfibers-Mechanical , Harihar

Student

Name: ANIMESH AHUJA . (2019ABPS0958P)

Student Write-up

Short Summary of work done: We did a research about positive displacement pumps and how they can be used in processing viscose material.

PS-I experience: It was a good learning experience.

Learning Outcome: We got to know about the working of positive displacement pumps working and their uses with respect to different industries.

PS-I station: Birla White Cement - Civil , Jodhpur

Student

Name: NITISH KUMAR MISHRA . (2019A2PS0703P)

Student Write-up

Short Summary of work done: My project during the PS – 1 was "recovery of wastewater from the nearby villages". Since my PS station is in Rajasthan, it always have to face the problem of lack of water resources. So, to resolve the problem we came up with the idea to recycle the wastewater from the villages surrounding the Plant. We

decided to setup multiple settling tank(1 for each 3-4 houses) for the purpose of filteration of the wastewater. Later, after filteration we were going to store that water in the villages and then transport them using pipelines to the Birla white cement Plant.
There the water will be completely treated and then it can be used for multiplr purposes like quenching as well as household purposes. This will reduce the diseases caused by the watsewater and reduce the environment and water pollution in the surrounding as well as it will resolve the problem of lack of water.

PS-I experience: The experience of PS - 1 was great but it could have been better if it was offline.

Learning Outcome: 1. Operating mechanics of major industries.
2. Leadership skills
3. How a company operates and executes its projects.

Name: MANDEPUDI PRANESHA (2019B5A20776H)

Student Write-up

Short Summary of work done: The project assigned is wastewater recovery from nearby villages. We were required to provide an optimal solution for wastewater recovery and treatment from the villages. We had discussions with our PS mentor and faculty on how to proceed with the project, identifying the problems of the area and also the general structure of the project. In our initial research, we identified the characteristics of the project area such as population, meteorological factors, and water supply and treatment. Then we were able to group different solutions and arrive at the best optimal solution. For the optimal solution, factors such as the economic condition, water availability, environment friendly, etc are taken into account. Finally, we estimated the cost of the proposed plan. Throughout this project, we read multiple research articles, journals and collected various data.The organisation is present in a water stress zone. The wastewater from the villages can be recycled and used by the organisation for industrial purposes instead of using fresh water.

PS-I experience: My PS-1 experience was good. The entire online PS- 1 is a new experience and found the online sessions very informative. The assigned mentor and

faculty helped us a lot by providing various data and gave advice about the plan to be adopted. It gave a lot information and helped me increase my knowledge.

Learning Outcome: I gained knowledge on wastewater management, different methods of wastewater transportation and treatment. Learned to choose an optimal solution which is not only economically feasible and environment friendly. We also learnt about the cement industry, steel industry, water resources development and management, through online sessions. I was able to improve my soft skills, presentation skills and team work.

PS-I station: Birla White Cement-Mechanical , Jodhpur

Student

Name: BANDARU SATYA ROHITTH . (2019A4PS0541H)

Student Write-up

Short Summary of work done: Project allocated to me was " Clinker grinding Process principle & application, O&M ". it was a study project. I was provided with the study material and resources based on the project. I have gone through the resources and had a meet with PS coordinator for clarifying the doubts and finally generated report.

PS-I experience: Mentor was so supportive during my hard times. my PS coordinator helped me whenever I got stuck with doubts.

Learning Outcome: Understood the difference between theoretical and industrial applications.

Name: PARTHÂ AGRAWAL . (2019ABPS0167P)

Student Write-up

Short Summary of work done: Understanding the working of Crusher and its principle was the main objective of my work. Some side projects were management of its running time and environmental factors.

PS-I experience: Birla white is a cement factory. We were around 6 students in mechanical. We all were allotted a different part of Industry. I was given Limestone Crusher. My PS instructor was very helpful. He sent reading material and explained to me whenever I had any difficulty. Overall it could be compared to an offline experience still it was best what could be achieved in covid-19 scenario.

Learning Outcome: It helped me learn about a crucial part of industry and gave me a virtual experience about it.

PS-I station: Blue star Limited-Mechanical (Air conditining and commercial refrigeration) , Ogli

Student

Name: DHRUV GUPTA . (2019A4PS0462P)

Student Write-up

Short Summary of work done: During this PS at Bluestar, I worked on two projects very closely related to each other, while one focused on reducing defects and the other aimed at increasing productivity. In order to work on both the problems, I first tried to understand the entire air conditioner manufacturing process followed at Bluestar and tried to identify the various loopholes at different steps and how all of them get accumulated and result in a number of defects and poor productivity. During this process the statistics and data provided by the company was really helpful as it gave a better idea of the entire problem and helped to come out with solutions in an organized manner. Followed by the solutions

and hypothesis was the simulations and testing step. After the successful simulations I came out with the final concrete steps to be taken to overcome the problems of the respective projects.

PS-I experience: PS-1 being my first ever industry exposure was really great and I had a lot to learn daily. Hence it made my summer term quite valuable and memorable. Working under the guidance of industry people was indeed an unique experience. For the first time I felt that I was less focused on the marks and more on the learnings that I was gaining from this experience. I wish I had received this experience in an offline term and had gone to the industry and looked at the working of the machines that I saw during the online plant tour.

Learning Outcome: I learnt how to work under the guidance of highly experienced industry people. Being the part of one of the best Indian air conditioners manufacturing companies, I got an opportunity to learn and understand deeply each and every step involved in the AC manufacturing process. I got familiar with various jargons used by the industry people. Some of these jargons were general like the ones used for quality management while others were quite specific to an air conditioners manufacturing unit. While working on the projects and trying to find solutions, I learnt about various quality management tools. Going through and understanding the PPTs and excel sheets shared by the industry and organizing the data received from them was also full of learnings. Finally the evaluations, like the group discussion or the preparation of the project reports and presenting them also added some highly valuable experiences to my PS1 term.

Name: UDAY VINOD NAIR . (2019A4PS0891H)

Student Write-up

Short Summary of work done: During the two months of PS-1, I worked on two projects. The first one was an app development project. We were divided into groups based on our project choices and the app development project had six people working on it. The objective was to create a barcode scanning app which would store data corresponding to that particular barcode, as entered by the user, into an excel sheet. We used android studio to create the app and instead of excel, used google sheets to store the data.

The second project was to increase the productivity of the outdoor production unit line in one of Blue Star's plants. Compared to the app dev project, this was more study oriented

and we were mailed several ppts and other study material over the course of the PS. We had to then apply these newly learned concepts and find solutions that required minimal investments.

PS-I experience: The main objective of PS-1 was to give us a brief insight into how professional organizations work and function, and also to teach us coordination with peers as well. Our PS instructor who was in charge, ensured the smooth flow of the PS throughout the course of the two months and was the primary point of contact with the company. Meetings were held regularly to check on our progress and if any help was required, both by the PS instructor as well as the project mentors from Blue Star.

Learning Outcome: I learned the basics of app dev and how to coordinate with several other members of our group to complete the project within the given deadline. The basics of productivity improvement, particularly how productivity is calculated, the various techniques used to improve a manufacturing line's productivity and how to come up with efficient and realistic solutions that can be employed with minimum investments.

Name: UPPADA HAREESH . (2019A4PS0913H)

Student Write-up

Short Summary of work done: For a more innovative and more efficient manufacturing process, I evaluated and implemented the following concepts:
1.) Productivity Improvement Indices like Labor Productivity, Material Productivity, Machine Productivity, and Capital Productivity.
2.) Innovative Productivity Improvement Techniques Used by Japanese Manufacturers Like JIDOKA, HEIJUNKA, KAIZEN (which includes SPC, SDCA, PDCA, POM, TPM), MOST, and Others
3.) Gained a better understanding of industry problems such as bottlenecks and how to avoid them.

PS-I experience: The overall PS-1 experience was fascinating and educational. The industry mentors and our PS Instructor ensured that I had enough time and resources to complete the projects assigned to me. Furthermore, the Group Discussions were very informative and helped me gain some ground on my project and a few key concepts.

Learning Outcome: PS-1 in Blue Star provided me with in-depth knowledge of the CDC Manufacturing Process (ME F219) and exposure to industrial applications of the concepts taught in the course.

Name: PRANEET PAWAR . (2019A4PS1366H)

Student Write-up

Short Summary of work done: App development for online-automation of Qa-Mis.
We developed an app to select the data for Qa-Mis alongwith barcode scanning functionality to add the model no into the Mis.
The App would use Google sheets as a database, as the datq could be accessed anywhere due to it being cloud based.

PS-I experience: The PS-1 experience was a great. I learnt new things which I hadn't done before. The industry mentors and the faculty were supportive.

Learning Outcome: I learnt many new things during the duration of my PS-I. I learnt basics of app development and also my communication skills improved a lot, as communicating with industry mentors is an important aspect during the project.

PS-I station: Carborundum universal Limited-Mechanical , Chennai

Student

Name: KOTHA SADHVIK REDDY . (2019A4PS0527H)

Student Write-up

Short Summary of work done: The project allotted to us was 'Design of 3D printing for Bonded-Abrasives'. We did research and analysis of various additive manufacturing methods and materials suitable for production of abrasives using those methods. We worked on resin-bonded abrasives and additive manufacturing technologies suitable for production of those abrasives.

PS-I experience: On the whole, it was a productive PS. As it was online, we couldn't visit the factories and production sites. I got to work with industry experts and gained useful insights on Abrasive industries.

Learning Outcome: - Insights on abrasive industries, production methods and supply chain management.
- Info. on developments in additive manufacturing technologies.

Name: AYUSH SONI . (2019A4PS0821G)

Student Write-up

Short Summary of work done: My project was to analyze the conversion of SKO-run furnaces to LPG-run furnaces. The analysis involved logistic and economic effects of the conversion, and predict if the process is industrially viable. I researched about the current industry fuel-market and the alternatives , that are more efficient and economic. Next, I did an exhaustive study to analyze pros and cons of the conversion procedure, including the logistical and environmental effects and compared the total cost of the upgradation and LPG-consumption against the current cost of operations , to draw a definite conclusion backed by facts and figures.

PS-I experience: My PS-I experience was enriching and productive. I actively participated in all the evaluative components moderated by the PS-I faculty and was guided by the Industry mentor, that helped me very much to complete the project.

Learning Outcome: PS-I was a remarkable learning experience, I got exposed to the corporate workflow,formal communication and organizational functioning. I learnt to analyze the industrial processes in great depth, and take decisions based on economic and logistic constraints.

Name: ADITYA RAMESH . (2019A4PS1035G)

Student Write-up

Short Summary of work done: Our project was on conversion from Furnace Oil/SKO/Diesel to LNG or LPG; to explore its merits and demerits and how it affects CUMI business. The work involved in-depth research into fuel from a market and sustainability standpoint, as well as to what degree does the switching improve the productivity of the company while saving on fuel cost. Reading up on research papers, looking at market trends and economic standing of fuels during pandemic took up the bulk of the work, alongside cost calculation and optimisation.

PS-I experience: My PS experience was WFH, so most of the hands on work that I would've had was not available. Regardless, our team made the best of its situation and we had a sufficient information pool to draw from. The workload itself was rather light, and this allowed me to multitask with other courses during my PS.

Learning Outcome: This PS-1 experience helped me understand the nature of large-scale improvements; the intricacies that go into it as well as the ramifications of replacing the original system. It improved my ability to look deeper and identify potential benefits and problems that a factor can provide.

PS-I station: CCS STRATEGY SOLUTION - FLEXSIM , New Delhi

Student

Name: KRTIN KALA (2019A4PS0546P)

Student Write-up

Short Summary of work done: We were divided into groups wherein each group was allotted a case study. The company inculcated an attitude of perseverance and persistence by encouraging us to use different resources to reach the desired outcome of performing a realistic simulation of the problem statement allotted. We had to simulate the most optimized worker distribution for an aircraft manufacturer wherein we were provided with certain constraints to consider.

PS-I experience: The PS station helped us gain perspective and widen our horizon on the factors to consider while consulting to give the most profitable outcome.

Learning Outcome: The PS station helped us in learning perseverance further taught us how to consider various parameters. We gained experience and learnt how to use Flexsim software which was a new experience for us which further widens our perspective on the various possibilities which open their door through this software.

Name: KARTIK ANEJA . (2019A4PS0595P)

Student Write-up

Short Summary of work done: Warehouse Simulation - This project aimed to determine the number of satisfied and unsatisfied orders in the current warehouse design considering the inbound and outbound material handling logistics over a time horizon of 3 months. The primary motive was to assess how the efficiency and effectiveness can be improved further in the present design, identify potential bottlenecks, and provide appropriate recommendations to get rid of them. I had performed a thorough analysis of data to enhance the effectiveness of the design.

PS-I experience: This station was my first preference, and luckily, I also got the project of my choice. I had already decided that I want to make my career in Supply Chain, and my PS-1 exposed me to the real world of it. FlexSim is powerful simulation software.

Having literate in it would give you an edge over your peers who wants to go in Supply Chain or Operations Management.
There were three projects, namely Aircraft Manufacturing Simulation, Automated Manufacturing Layout Simulation, and Warehouse Simulation. One had to choose a formal project out of these three but can pursue all three if one could spare time.
If I am allowed to go back in the past and fill the preference list of PS stations again, I would still love to go for this station no matter what and would have tried to pursue it with much more enthusiasm.
You can always reach out to me on LinkedIn to know more about this station.
LinkedIn : https://www.linkedin.com/in/kartikaneja1612/

Learning Outcome: Supply Chain Logistics Simulation, Data Analysis, Warehousing, Inventory Management

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Name: MEHENA MAJUMDAR . (2019A4PS0741G)

Student Write-up

Short Summary of work done: We have to do aircraft manufacturing simulation using FlexSim software. We have to find out which operator workforce combination in the manufacturing layout will produce the least lead time.

PS-I experience: It was really good. A lot of new features about the FlexSim software was taught. Gained new experiences through presentation and group discussion.

Learning Outcome: Got familiar with a new software which may be helpful for me in the future. Got a little exposure about manufacturing sector.

Name: SATVIK RAM METLA . (2019A4PS1241H)

Student Write-up

Short Summary of work done: Together the team tried thinking around the problem and came up with different solutions and we shared our solutions with each other. We had figured out the basic layout of the manufacturing simulation and were now trying different inputs in the simulation. We also tried to learn about different kinds of simulation and how to classify each. We made progress on our problem statement and had an idea on how to go about it. We had started running simulations by now.

PS-I experience: It was a good brief exposure to industry related work.

Learning Outcome: I've learned about supply chain, operations and completed a project on aircraft manufacturing simulation.

Name: DHARIN NIMISH SHAH . (2019ABPS1074P)

Student Write-up

Short Summary of work done: Simulated a Automated Manufacturing Layout of the Tata cycle company. The layout had many defects, these were computed by bottleneck analysis and resource utilisation analysis.

PS-I experience: It was a great opportunity to interact with industry leaders and have the exposure to the systems and working of corporate sector.

Learning Outcome: Learned about the workflow of the company and most essentially learned the FlexSim software.

Name: VARUN LENKA . (2019B4A40074G)

Student Write-up

Short Summary of work done: My work project was aircraft manufacturing simulation. We had to simulate the manufacturing process through the software flexsim. Out of 3 different cases we had to find out which case of manufacturing layout would be best and the most efficient for the company.

PS-I experience: It was a wonderful opportunity for me to work on this project using this software. The mentors were really helpful I would consider this as a really good learning experience.

Learning Outcome: I got to learn about the software flexsim and how to simulate different manufacturing processes. I also learnt about different kinds of simulations and queueing theory. This project helped me understand how real life industries simulate their work.

Name: AMEY AGARWAL . (2019B4AB0731P)

Student Write-up

Short Summary of work done: We learnt the use of the software 'Flexsim'. We then used the same to make a Warehouse Simulation to solve the problem statement given to us.

PS-I experience: It was a healthy experience. We were allowed to think for ourselves, and using a new software was interesting.

Learning Outcome: We learned the importance of simulation, and the specifics of it's power. Ofcourse, learning the software itself was useful too.

PS-I station: Central Leather Research Institute-Chemical (Unit process & operation) , Chennai

Student

Name: HEMANSH SOLANKI . (2019A1PS0224G)

Student Write-up

Short Summary of work done: The Work in the institute in mainly research based . So if anyone is more interested towards research work they may apply here for PS. There is a great opportunity that your research can be published if you have done a great work in the research topic provided to you.

PS-I experience: PS-1 experience was great. I got to learn various things in this 6 week internship. I had good experiences about learning new stuff and communicating with company people. As my Industry mentor was good. Since I am from chemical background and I got Environmental Engineering research field .He helped me a lot in understanding the Research topic. All the Scientist in CLRI is great.

Learning Outcome: I learnt many thing in Environment point of view. Since my research was on waste management. That is converting waste into clean energy. learn to Explore different dimension on Solar dryer and Pyrolysis.

Name: SARTHAK VATSA . (2019A1PS0610P)

Student Write-up

Short Summary of work done: Read around 20-25 research papers and wrote a mini review article on leather waste derived advanced carbon material and it's application

PS-I experience: Good and wholesome

Learning Outcome: Learnt about research work

Name: DEV CHOUDHARY . (2019A1PS0883G)

Student Write-up

Short Summary of work done: I worked in the Inorganic & Physical Chemistry department of CLRI under Dr. S. Easwaramoorthi, Principal Scientist. My project was on Graphitic carbon nitride based Photocatalytic water splitting for hydrogen production. Photocatalysis, inspired by natural photosynthesis, is one of the most appealing and promising technology for directly harvesting, converting, and storing renewable solar energy for the generation of long-term green energy in form of chemical bonds, such as Hydrogen. Graphitic carbon nitride was studied as a potential photocatalyst and its properties, synthesis, design strategies, and advantages and disadvantages were thoroughly studied. Finally, I was successfully able to write a review paper on my topic.

PS-I experience: PS-I was a highly beneficial experience for me. In 2 months, I got exposed to the research culture and applied the same throughout my project. Though this PS-I was conducted through virtual mode and it was not easy to do research but with consistent efforts from me and by my mentor, I was able to learn and complete my project.

Learning Outcome: Academic Skills:
1. Learnt the fundamentals of photocatalytic water splitting and Graphitic carbon nitride as photocatalysts.
2. Literature Survey and effectively reading research papers.
3. Writing formal reports.

Soft Skills:
1. Effective communication and clear articulation of thoughts.
2. Time management.
3. Effective and engaging presentation.

Name: DIVYANSH D DWIVEDI . (2019A1PS1125G)

Student Write-up

Short Summary of work done: I worked towards studying characteristics of alginate based bioink in 3D Bioprinting and its various applications in tissue engineering and organ repair. In the research field, the cells printed using these inks are worked towards planting them into the patient's body. Bioink has to be selected keeping in mind its low cytotoxicity, along with rheological parameters (viscosity, shear strain) to ensure the most efficient printing. I studied various mathematical models that were proposed to increase the bioink's efficiency. Knowledge gained in 2nd year was helpful in gaining a better idea about the models.

PS-I experience: Overall a great learning experience, I learnt how various departments in the Research Institute work towards promoting scientific endeavors in the country, how they have various dedicated labs specializing in different domains such as polymers, biotechnology, organic and physical chemistry. I learnt how to review and understand research papers, I got a brief idea about how to write one as well, so it would assist me in the future should I decide to write one.

Learning Outcome: I learnt time management skills - it is crucial to juggle personal and work life efficiently. I learnt how to communicate in a formal and professional manner as a representative of the Institute to the PS organization. I learnt how to make good presentations along with portraying their content in the most fluid manner. I also gained insights about how the research field works, giving me a good idea about whether to pursue it as my occupation.

Name: JYOTI DIXIT . (2019B1A10867P)

Student Write-up

Short Summary of work done: My project was basically divided in two parts. The first one was about the literature survey of organic reaction. In this extensive research was done about the industrial applications of the organic reactions and the newer advancements in the field of chemistry. This part of the project was particularly focused on the research papers published in the year 2017 and onwards.
The second part of the project was regarding the experimental analysis. In this I designed a homemade setup for quantitative analysis of absorbance of light in a solution when we change the concentration of solvent. This was a very budget friendly setup in which different concentration and different colour dyes were used as the solutes. This experiment was basically the verification of beer-lambert law and it's applications.

PS-I experience: The PS-1 surely has been a great learning experience for me. Being the starting point of my industrial life, it has great importance and luckily, for me it turned out to be a great one.

Learning Outcome: There were many things that I learnt during the course of PS 1. To list a few, I came to know about the advancements made in the field of chemistry in the recent years and also how simple things from our daily lives can pe put to use to set up an experimental setup. Apart from this, I even learnt soft skills like effective communication among my peers as well as with the senior authorities. PS 1 even helped me improve upon virtues like punctuality and commitment towards a project.

Name: PRANAY VENKATESH (2019B2A11004P)

Student Write-up

Short Summary of work done: Theory of macromolecular crystallography and collagen structural biology. Analysis of the bioinformatics data of protein sequences using ClustalX and generating the 3D structure of collagen-related peptides virtually using tools like Coot, Avogadro and imosflm. Reviewed the various synthetic schemes to generate stable and useful collagen-related peptides for analysing the structural biology of the protein.

PS-I experience: Very enriching experience, despite the online medium. Dr. Jaimohan of CLRI made me feel comfortable and taught me the related concepts of whichever area

I was interested in. I was also sent textual and video content to further my understanding. I learned a lot and felt I could contribute to the scientific community.

Learning Outcome: I learned about the theory of X-Ray Diffractometry. I also learned about the practical details of setting up a diffraction experiment, including purification of a protein sample, detecting denaturing and crystallisation of the protein. Apart from this, I learned how to use the tools that allow us to virtually analyse the structure of proteins including ClustalX, Coot, Avogadro and imosflm. Furthermore, I learned about the CCP4 suite of tools and used it as an intermediary to link the theory of X-Ray Diffractometry experiments and the virtual 3D structure.

PS-I station: Central Leather Research Institute-Chemical(Energy Management) , Chennai

Student

Name: ARYAN CHOUDHARY . (2019A1PS1053G)

Student Write-up

Short Summary of work done: Reviewing research papers on biogas production and upgradation and how the leather industry can provide as being a reliable source for it. Learning extensively about the existing upgradation techniques and how membrane separation technology has proved to be very promising in developing hybrid technological solutions for upcoming industrial challenges.

PS-I experience: It gave me a proper understanding of the professionalism practiced in the academic field and combined with PS evaluative components, an overall solid experience.

Learning Outcome: Learned about how to find resources and then also navigate through them to forge an understanding about new topics.

Name: R ANURAG . (2019A1PS1524H)

Student Write-up

Short Summary of work done: My area of work was to investigate the various applications of nanotechnology in the leather manufacturing process. Leather manufacturing consists of predominantly four stages: Pre-tanning, Tanning, Post-tanning, Finishing. I focused on how nanotechnology was able to aid these processing stages to make them more efficient and sustainable. I also worked on instances where nanotechnology could combine with conventional technologies to enhance the multifunctional properties of leather. Towards the end of PS1, a review paper was written covering all the key aspects of nanotechnology that helped enhance the entire leather processing chain.

PS-I experience: PS1 at CLRI was one of the best experiences I've ever had in my academic life so far. I got to work with the best scientists in the field. Leather is often overlooked upon by most people but there are lots of complex procedures that happen in order to manufacture good quality leather. I got the chance to explore each of these complex procedures in detail and also got to contribute to these procedures to make them more efficient.

Learning Outcome: The main learning outcome of PS1 at CLRI was to understand how leather processing takes place right from procuring the skin/hide and converting them to end user products and how emerging technologies like nanotechnology can be utilized to make the process more efficient and sustainable. I also learnt how to document and write scientific papers.

Name: CYRIL BENNY . (2019B4A10584P)

Student Write-up

Short Summary of work done: I was under Dr. B. Ravikumar, a scientist from the PPBD department of CLRI.
The Topic of my project was: STUDY ON DATA ANALYTICS RELATED TO LEATHER SECTOR
I worked on collecting the data on the natural calamities that had struck India in the timeline of 1950-1970 and also collected and compiled the data on the Livestock death toll in India due to these Natural calamities like Earthquake, Cyclone, Landslide, Hurricane etc. I was also tasked with verification and cross-referencing of the secondary data collected on the Livestock death toll from 1950-2019 in India due to the aforementioned Natural disasters. I helped my mentor in validating a data set on the Human Population among selected districts around India for research purposes at CLRI along with gathering the information on the statistical report on the districts Leh and Kargil of newly formed UT Ladakh. I prepared a literature review on various articles on Data Analytics and understood the tools used in Data Analytics.

PS-I experience: It was wonderful.
The Practice School-I (PS-1) has provided me with a fascinating experience working alongside an exceptionally talented scientist in a topic I am really interested in. I believe that this experience gained will help me with all my future endeavours.

Learning Outcome: I got a grasp of handling Data in MS Excel in a faster and efficient manner. Learned the basics of Statistics, and various tools necessary for Data Analytics and Data Analysis such as knowledge on Linear Regression and Correlation. The work in Data Analytics done in the project only touches the surface of an ocean of knowledge. I believe that by gaining more knowledge in Data Analytics, more accurate predictions and analysis can be done for any datasets.

PS-I station: Central Leather Research Institute-Electronics , Chennai

Student

Name: DEVAANSH CHANDRA GUPTA . (2019A3PS0187P)

Student Write-up

Short Summary of work done: My mentor, Dr. Malathy Jawahar, and I were working on automatic detection of diabetic retinopathy through eye fungus images. The idea was to create a novel deep learning/image processing based algorithm to perform lesion segmentation on a dataset with labels pertaining to the severity of the disease. Along with this, class discovery was being performed so as to automatically grade the severity of the disease. This was solving multiple problems - reduce variance on reliance on human-made datasets; performing self-supervised segmentation without presence of a ground truth labels and a generalisability to other diseases.

PS-I experience: My PS-I experience was surprisingly very enriching. My mentor was very patient and responsive to any questions that I had asked her. She was very helpful with resources that I needed. She also provided the much needed guidance for such an ambitious research project. The station itself was also very flexible with work timings.

Learning Outcome: This was really my first proper experience with deep learning, image processing and research in general. For this, I learned a lot about programming with Python and working with OpenCV, PyTorch and Google Colab. Along with this, I read a lot of research papers every week which gave me an insight into the current SOTA techniques in a lot of different fields. I also learned how to make a research proposal and technical reports.

PS-I station: Century Rayon-Mechanical , Mumbai

Student

Name: MAHIMA PAREEK . (2019A4PS0912H)

Student Write-up

Short Summary of work done: Calculated duct diameters for spinning halls of the plant. And designed the duct system from scratch, taking into account all the losses. Also, calculated efficiencies for various air washers, and gave the plant optimal temperatures for highest efficiency.

PS-I experience: It was nice. Very informative.

Learning Outcome: Learned about HVAC systems. It would be helpful in the industry.

Name: HRIDAY MAHESHWARI . (2019B2A40948P)

Student Write-up

Short Summary of work done: Worked on duct design and calculation of air washer efficiencies for the HVAC(Heating, Ventilation and Air Conditioning) system installed at Century Rayon. Working in a team of two, we were supposed to apply various methods for duct sizing such as Velocity Reduction, Equal friction loss method to calculate various parameters such as air velocity in ducts, duct dimensions, pressure drop etc. Our aim was to design a cylindrical duct system for future reference of the company, as they are currently using a rectangular based duct system. Apart from ducts, we were assigned to calculate air washer efficiencies at various wet bulb and dry bulb temperatures.

PS-I experience: My PS-1 experience ranged form mediocre to good. Due to the PS being online, the lack of communication form the company's side was a challenge in the initial weeks. However, once the meetings got going, our project picked up pace. We were given all the necessary data by our PS mentor. The project was also very exciting which kept us me motivated throughout. Our PS in-charge Dr. Phaneendra Kiran Chaganti was a very big help and support for which I am very grateful.

Learning Outcome: I learnt about the engineering which goes behind making an efficient duct system and the requirements of different industries. Also learnt how to work in a team, time management, resource management, meeting deadlines and how to work manage yourself in crunch situations. Overall it was a mix of technical as well as managerial learnings.

PS-I station: Chemical & Mineral Industries Pvt Limited-Chemical (Unit process & operation) , Jodhpur

Student

Name: OAMKAAR AADITYA MISHRA . (2019B5A11504H)

Student Write-up

Short Summary of work done: We learnt about the pros and cons of the situations and conditions of our company which specializes in quicklime production and is the largest producer in India. The interesting thing is that our company uses solid fuel due to lack of availability of natural gas in Rajasthan. We thus researched on methods to decrease fines generation as that effects the products of the company and also researched on techniques for removal of sulphur from petcoke for further effectiveness.

PS-I experience: It was fascinating and we learnt a whole load of new things, we got to know how a lime kiln works and also the advantages and uses of quick lime in other industries.

Learning Outcome: The uses and production factors of quick lime from limestone. The ways to improve production and also coordinating with colleagues and peers.

PS-I station: Chemsys Process Engineering Pvt Limited_Chemical (Process improvement & utility calculations) , Pune

Student

Name: AYUSHI KUMARI . (2019A1PS0960G)

Student Write-up

Short Summary of work done: I was interning with Chemsys Process Engineering Pvt Limited Chemical Pune. In the span of fifty four days, I learnt to use excel for process improvement and utility calculations using the YouTube playlists for beginner, intermediate and advanced levels provided by Dr. Rajendra Mohite (company mentor). I was assigned the work to design a three phase separator (both horizontal and vertical configurations in SI units as well as field units). Following which I was asked to prepare a process design for batch distillation with rectification (both binary as well as multicomponent systems) and then ,I also prepared the mechanical design for vessels under internal and external pressures .During the past few weeks, I was thoroughly evaluated and guided by Dr. Nilanjan Dey (Institute mentor). My knowledge was tested through a set of quizzes comprising multiple choice questions. My interpersonal and professional skills were assessed through group discussions. Meanwhile Dr. Rajendra Mohite (company mentor) also assessed my designs and calculations from time to time, giving me feedback so as to come up with better designs.

PS-I experience: I developed technical as well as professional skills during my PS-I at Chemsys Process Engineering Pvt Limited Chemical Pune .I learnt how to apply my knowledge in an industrial setup .I learnt excel for process improvement and utility calculations .I also designed three phase separator (both horizontal and vertical configurations) ,then a process design for batch distillation with rectification (both binary as well as multicomponent systems) and then, also the mechanical design for vessels under internal and external pressures .I learnt to take constructive criticism well .I also learnt to work hard even if the task seemed unimportant .My internship taught me to make my own decisions and do things on my own under proper guidance from experienced mentors .It was hence a great learning opportunity for me.

Learning Outcome: One of the most important things I gained from the internship is the newfound knowledge. This included learning the process and plant design and making calculations for various surface production operations. I learnt the ability to speak with people in a professional setting .I learnt to take constructive criticism well .I also learnt to work hard even if the task seemed unimportant. It helped me build a good work ethic .My internship taught me to make my own decisions and do things on my own under proper guidance from experienced mentors .All these showed me how an industry really works ,giving me an experience for the future .

Name: RISHI RAJ AGARWAL . (2019A1PS0698P)

Student Write-up

Short Summary of work done: My project was on process and equipment design. Using different reference books I was to design different processes and equipment or was to calculate operating conditions. All work was done on excel. My first project was design of double pipe heat exchanger. Second project on design of vacuum systems and third project on cooling tower calculations. In particular I had to in excel take some input using some correlations and excel functions give the output values and compare them and configure a system with appropriate values.

PS-I experience: My experience at chemsys was quite good. It was most importantly because of the nice ps faculty as well as industry mentor I got. My ps faculty was Dr. Nilanjan dey who was quite supportive and would conduct meets every now and then to ask whether our ps is going well and what needed to be done to improve. My industry mentor Dr. Rajendra mohite was also quite helpful and was in constant contact with us and took regular meets to stay in contact with us.

Learning Outcome: Because of the internship I feel that my core knowledge has greatly improved along with my communication skills. Working in a company brings discipline as we were given submission dates for submitting our work. All our work was done on excel so for the first week we were given 3 playlists on excel from basic to advance. Working on excel for 2 months nearly vastly improves your skills on it.

PS-I station: Chemsys Process Engineering Pvt Limited_Chemical (Process modeling & simulation) , Pune

Student

Name: NIRMALYA GHOSH . (2019B2A11149H)

Student Write-up

Short Summary of work done: designing and simulation. i learnt how to calculate material discharge and thermodynamic rates

PS-I experience: It was good, i learnt a lot about chemical

Learning Outcome: i learnt more about the basics of thermodynamics in chemical related fields

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PS-I station: Chemsys Process Engineering Pvt Limited-Chemical (Unit process & operation) , Pune

Student

Name: AKSHAT PATEL . (2019A1PS0664P)

Student Write-up

Short Summary of work done: Basically we were given some design problems that we had to solve in MS Excel. In the first week a playlist was provided with various things to learn about excel. Next week the problems were given. We had problems from Heat transfer, mass transfer and fluid mechanics.

PS-I experience: It was a great experience. The industry mentor was great help, and was usually available to discuss our doubts and problems. Also I felt like we were doing actual work and not just sitting around researching random stuff which i heard was a common thing in other stations. Finally I learned a lot from this station and would recommend it to everyone who wishes to learn about Chemical Engineering consultancy.

Learning Outcome: I learned a lot about excel, its various functionalities and how to use it to solve design problems of various chemical engineering devices like heat exchangers and scrubbers.

Name: VAISHNAVI RAGHAV . (2019B2A10955P)

Student Write-up

Short Summary of work done: I got 3 projects during my PS-1. In all three of them, I had to do design calculations on excel.

PS-I experience: It was a great learning experience.

Learning Outcome: I got to learn so many new things.

PS-I station: Department of Agriculture , Goa

Student

Name: KATUKAM PRANAV SRIVASTAV . (2019A7PS0077G)

Student Write-up

Short Summary of work done: E-Krishi is a Directorate of Agriculture, Goa initiative which was created for one time registering of farmers within the state and delivery of schemes with the help of the E-Krishi Card. Our task was to analyse data that has accumulated over the course of functioning of this initiative and extract trends and patterns from the data by using python language with the help of various data analytics, data manipulation tools such as pandas, numpy and then create a interactive dashboard to showcase these trends and other helpful data using visualization tools such as matplot, tableau. These trends and visualizations will be useful for the Department of Agriculture

in introducing new schemes, modify existing schemes and give an overall insight of the impact of these schemes and how they can be made better to benefit the farmers.

PS-I experience: It was a great experience exploring a new field with only a small drawback being an online experience instead of hands-on, the working hours were flexible and our Industry mentor (Mr. Saieesh Gandhi) gave us a lot of freedom to explore, do changes to the project and both the Industry mentor and PS Faculty (Prof. Rajesh Kumar) provided continuous support and valuable inputs throughout the project.

Learning Outcome: With the help of this project I was able to delve deeper into data analysis with python and visualizations with matplotlib and tableau. Along with the intro to a new field like agriculture, I was also able to gain valuable insights of how a huge organization operates in real life, how a real life data set looks like, and what types of trends and patterns are useful for the department, the key points in the making of a new system and how these interpretations from the data impact major decisions related to the economy itself and the schemes deployment.

Name: VISHNU TEJA SOOREA . (2019A7PS1005G)

Student Write-up

Short Summary of work done: The project was Data analysis and visualization of data related to various schemes introduced in the state of Goa. There were about 15 different scheme related data provided for which trends were to be found. After finding trends and patterns, interactive dashboards were created to display the trends.

PS-I experience: It was a good experience overall. The timings for work were flexible and the PS mentor was very helpful. We had all the freedom to proceed with the project in any manner we wanted. It was the first real world experience and I had a lot to learn. Working in a team and communicating effectively was one of the most important aspect of the work experience. We got to work with real-life data, collected by the Department of Agriculture from the farmers of goa, to find insightful trends and patterns. It is fantastic to help the government with our analysis which would help the farmers of Goa.

Learning Outcome: Technical: Data Analysis, Python, Pandas,Matplotlib,MS Excel
Other: Helped in developing soft skills like communication, presentation skills,responsibility,etc

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Name: DEO ABHIJIT SHREERAM . (2019A8PS0041G)

Student Write-up

Short Summary of work done: Our work was mostly focused on finding trends and patterns in the data. And as a final output we had to prepare a dashboard

PS-I experience: It was very nice experience, now I can easily manipulate data with pandas and numpy and python.

Learning Outcome: I learnt about pandas, numpy and other python libraries.

Name: T P CHANDRA CHUDAN . (2019B1A11030P)

Student Write-up

Short Summary of work done: We were given a data analysis project and were instructed to create a dashboard as the final deliverable.
We were first asked to familiarize ourselves with the domain knowledge of the project ie agriculture in Goa.We learnt about the flagship ekrishi project of the department and all the schemes provided by the government for the benefit of the farmers.
Once the data was given ,we cleaned and prepared it.Then we analyzed the data discovered a lot of trends and built a dashboard showing all the results we found.
This will be used by the DOA to take more informed decisions to help all the farmers in Goa in the future.

PS-I experience: I have had a good introduction to the professional setup outside of college.I have understood how a company works and what is required and expected out of an employee. The mentors were extremely supportive and flexible.They encouraged fresh ideas and wanted us to think differently.They were not demanding and let us work independently as long us we met the stipulated timeline. I would definitely recommend the station if you want to learn individually ,along with your group, without a lot of instructions and guidance (majorly on the technical part).The projects from this station are interesting ,progressive and meaningful as they can help thousands of farmers in Goa.

Learning Outcome: In the due course of the PS1, I was able to learn how to successfully complete a data analysis project on a fixed timeline.
I have learnt python and its associate libraries like numpy,pandas,matplotlib and seaborn for the analysis and Tableau for building the dashboard.
I could improve on my soft skills through the interactions with my group members, presentations and all the different evaluatives that were conducted.

Name: Shagun Somani (2019B5A40756P)

Student Write-up

Short Summary of work done: Department of Agriculture has implemented a project to digitalize the process of the availing subsidies under the name 'e-Krishi' this project has generated an enormous data in the last 5 years, our task was to find the trends and correlations in these datasets through Data Analysis and were asked to present these trends as a visual dashboard as final output which would help the Department in better understanding of insights of the government schemes and which in turn would help them in making and modifying their policies in future.

PS-I experience: For the first 10 days, we were asked to understand the background of Agriculture in Goa so that we can understand and interpret the data better. Then we were given Datasets and we decided to go with python for the data analysis. We learned libraries like NumPy, Panda, and Matplotlib, we also used excel tools to merge and clean the data. Then we presented our trends and analysis through a visual interactive dashboard which we created with the help of Tableau.

It was a great learning experience not only got the exposure to Data Analysis but also got to know about the government functioning, policies, and implementation and most importantly I got to work on an impactful project which would help in better policymaking and thus in turn would help the farmers throughout the state of Goa

Learning Outcome: Data Analysis and Visualisation, Excel, Python, Tableau

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PS-I station: Development Consultants Pvt Ltd-Civil , Mumbai

Student

Name: HITANSHU . (2019A2PS0687P)

Student Write-up

Short Summary of work done: my ps -1 started off pretty well as in the first week itself our work started . First of all we were all required to learn basics of staad pro for which there are many good you tube videos present. Then every week we were provided with one question that we were required to solve and on every Monday we had a meet with ps mentors with whom we discussed the problems that we faced while solving those questions . Besides solving questions there was also continous evaluation like group discussion ,seminar etc .

PS-I experience: My PS-1 experience was pretty good . They gave some good questions on staad pro which required deep understanding to solve those questions . Mentors were also very supportive they were pretty quick in responding to my queries .

Learning Outcome:
Major outcome was learning staad pro . The structural analysis and construction of Staad pro played an important role and helped engineers all over the world. Especially important is that although Staad is increasingly used for various types of engineering structures, namely skyscrapers, bridges, foundations, piles and even pipes. Therefore, today's engineers rely heavily on analysis and design software. We have lost our understanding of design behavior and only deal with numerical results, which will affect the perception

of correct design. Therefore, it should be understood that even the most complex analysis/design packages require skilled civil engineers to operate them.

Name: BHUMIKESH JAT . (2019A2PS0834P)

Student Write-up

Short Summary of work done: I worked on staad pro software. We were given different situations for same structure to help us understand the importance of orientation, supports etc.

PS-I experience: It was a good experience.

Learning Outcome: I learnt about staad pro software and its industrial use.

Name: CHEZERLA SASIDHAR REDDY . (2019A2PS0918P)

Student Write-up

Short Summary of work done: My PS work is mainly about the analysis of structures using StaadPro. In this we use to check the deflection, bending moment, shear force of structure or a building , so that we could know the stability of the structure.

PS-I experience: It was a good one, as the first time speaking in a group discussions and presenting to everyone. It was also good, while knowing the core work in civil engineering field.

Learning Outcome: I learned how to use the software which I have not learned. I learned a part core work done.

Name: PRANJAL VASHISHTHA . (2019B4A20680P)

Student Write-up

Short Summary of work done: The main objective of the the PS project was to understand the basic workings of STAAD Pro software and solving problems with the help of it. The assigned questions included both problems to strengthen the basics as well as problems which uses practical application of STAAD Pro software in industrial work, like analysing a 3D structure and the truss analysis in a bridge construction.
Aside from the project, the PS-I also included tasks such as weekly planning in form of a diary and Group Discussions to encourage social skills.

PS-I experience: The PS-I experience was very good. The faculty as well as the assigned industrial mentors were really encouraging for all of PS work. The instructions provided were clear and easy to understand and they were always there in case of a doubt or just talking about the workings of an Industry.

Learning Outcome: The learning outcome for me is the basic understanding and problem solving ability on STAAD Pro software, increased social and conversational skills, understanding the workings of Industrial environment, as well as the experience of working on a project with a proper schedule and punctuality.

PS-I station: Development Consultants Pvt Ltd-Mechanical (CEMA Std) , Mumbai

Student

Name: MATSA SAI SURESHKUMAR . (2019A4PS0436G)

Student Write-up

Short Summary of work done: We have been taught about belt conveyor, it's components, and calculations using two different standard methods called IS-11592 and CEMA. Learned how to design a belt conveyor using those standards and calculations. Mentor from industry is really a good person, he helped us while doing calculations if we had any doubts, used to conduct session for class and clearing doubts frequently. Totally we were taught about designing a belt conveyor.

PS-I experience: It was really a good experience, thanks to BITS pilani for giving us this opportunity to be a part of it. Though it was online mentor helped us really good and ps-faculty from bits they have provided is really a good person and helped us to learn some good things like, group discussion, giving presentations and seminars.
Thank you

Learning Outcome: Learned about designing a belt conveyor using two different standards. Improved communication skills, excel skills, thought process, presentation skills.

PS-I station: Dhio Research , Bangalore

Student

Name: NIRANJAN NANJAPPA . (2019A4PS0351H)

Student Write-up

Short Summary of work done: The work in the PS 1 station was divided into two phases. The first phase involved course lectures on fem by industry experts. The second phase involved the actual project and was in essence an application of the concepts taught in the first phase.

The project involved a numerical study of farm equipment under given loads and boundary conditions. The project assigned also entailed a short literature review which helped in acquiring a better grasp of the problem. All in all, the experience was enriching

PS-I experience: My ps 1 experience was a learning one as I was able to learn about the working of industries and was able to get some experience outside of pure academia. The projects assigned helped gain some meaningful experience on working on problems with concepts gained during courses and the industry lectures

Learning Outcome: My project involved a static structural analysis in Ansys. This, I was able to gain experience in using Ansys static structural.
The project also involved a literature review. As a result, I was able to gain some experience about the way in which literature review is done

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Name: AYUSH KHAITAN . (2019A4PS0371P)

Student Write-up

Short Summary of work done: Learned FEM, applied it to perform structural analysis of a human teeth on ANSYS.

PS-I experience: Enlightening to the work experience.

Learning Outcome: Learned the how-about of a functioning workspace, be a part of something significant.

Name: ABHIJIT PRANAV PAMARTY . (2019A4PS0824H)

Student Write-up

Short Summary of work done: Training in FEM and ansys. Structural analysis of riveted joint under ramped loads. Calculation of force required for yielding in tension and compression, when using linear and non-linear materials.

PS-I experience: Overall good, if even the PS station was a bit unresponsive and learning was hampered by the online mode.

Learning Outcome: Learnt simulation in ANSYS, time management and prioritization of tasks.

Name: SIDHARTH ENAGALA . (2019A4PS0963H)

Student Write-up

Short Summary of work done: Initially in our PS , we had classes where we learny the Gaussian quadrature rule. We went on to learn about FEM and how to apply it in various physical phenomenon. We solved a lot of problems involving Structural analysis using analytical methods like the FEM.
We then learnt a little about solving the same problems on ANSYS. We were then assigned projects. My project was a thermal - structural analysis of an automotive roof. I had to first deal with a plain cad model, which I then had to simplify and mesh and carry out various simulations on to acquire the end result.

PS-I experience: My PS was quite fruitful. I learnt a lot about the Finite Element Analysis.I also learnt a lot of simulation. I found the work to be quite doable and met the deadlines quite comfortably.

Learning Outcome: Finite Element Method. Ansys.

Name: AKSHAT KALRA . (2019B2A40951P)

Student Write-up

Short Summary of work done: We were taught the pre requisites required for our project and in the last week we were allotted different projects in which we performed different things like cleaning and repairing CAD models for the analysis to be performed for eg. I had to do the structural stability analysis of automotive chassis. The cleaning and repairing was followed by meshing and adding loads and boundary conditions and then solving it.

PS-I experience: It was a good experience, I learnt new things which I hope will help me greatly in the future.

Learning Outcome: I learnt different topics in mechanical and usage of softwares which help in solving real life mechanical problems

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Name: SWAYAMBHU STHITAPRAGNA BHOI . (2019B4A40748G)

Student Write-up

Short Summary of work done: My work was to understand and learn Finite Element Method, which is one of the most commonly used techniques in mechanical simulations. I then applied the theory to do simulations.

PS-I experience: Very Good

Learning Outcome: It was a good experience to know the ins and outs of a mechanical research facility

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PS-I station: DomTech Robotics & Automation-Mechanical , Nashik

Student

Name: SAMAKSH JUDSON (2019A4PS0278P)

Student Write-up

Short Summary of work done: Learnt 3D modelling and CADed robotic postioners.

PS-I experience: Good learning experience, enjoyed it thoroughly.

Learning Outcome: SolidWorks/Fusion 360.

Name: ADITYA NAIR . (2019A4PS0437P)

Student Write-up

Short Summary of work done: DomTech is a young start-up aimed at industrial and home automation. Our team's focus was on welding automation. Initially we had to make a report on automated welding in today's world and then we were given the task of designing a welding positioner which is essentially a platform that can automatically move the workpiece around to make it easier for a robotic arm to weld on it. Our focus was on making a product that offered a creative, commercial or operational advantage over the competitors. We began by making sketches for the design on paper and selecting the appropriate motors, gearboxes, materials etc. We had to make sure our work was mechanically viable, I love zehaan sharma and feasible to fabricate. The next step was 3D modelling in either SolidWorks or Fusion360 to make our designs more life-like. Since

the application was industry oriented, the force/torque demands were immense in some cases and a final stress analysis needed to be done to make sure we designed everything properly and in the end we had to create a bill of materials to predict the cost of our design being implemented. Since our team showed enthusiasm throughout and completed this project ahead of time, we were given another similar task regarding the automation of a punching press machine and we're continuing with this task outside of PS-1.

PS-I experience: The CEO Pranam Rajpurohit and CTO Jubil Mahadevan were our mentors throughout PS-1. After our team showed some pep in the first week by promptly finishing tasks ahead of time, we were assigned this project. Jubil was not much older than us and he was always very approachable and understanding to our concerns. There was clear communication throughout and thus most of our work together was actually a lot of fun. The 3-D modelling period took up a lot of our time because it was something we hadn't been taught in college and in general is a very tedious process. Also, designing something capable of adhering to industry standards, constraints of cost and availability was something very challenging and warranted a lot of time. All in all, it was great learning experience and it kept us hopeful about the jobs possible in the mechanical automation sector. We were also given an opportunity to work with the other teams if we wanted to explore beyond our domain.

Learning Outcome: We became very comfortable with 3-D modelling (SolidWorks/ Fusion360) which is a very essential process in designing. We also learned how to select the best components while designing a product and how to optimize our designs while making them tolerant to bending, torsion, elongation and shearing along with the best methods to fabricate them. We also learned a bit about what it takes to run a start-up in India through our mentors.

Name: ACHYUTH P . (2019A4PS0714G)

Student Write-up

Short Summary of work done: The work involved design and analysis of a robotic positioner with 2 degrees of freedom, that facilitates the automation of welding. The company provided constraints like diameter and maximum weight of workpiece. Initial sketches were given before starting the CADing process. I used the Autodesk Fusion360 to model my design. As a team of 4, we submitted 4 separate designs. The later part of the project was to select the appropriate working parts like motors and gearboxes which

would meet the torque requirement of the designed model and provide the adequate RPM. This required the use of the moment of inertia formula among other theoretical formulas and concepts, basically what we learnt in the previous semesters. Since the assigned station was a startup, we had to consider providing cost effective alternatives to the work parts. A bill of materials was also to be provided at the end of project. About 6 weeks in as this project was about to conclude, the company put forward a 2nd project as well - a gantry system to automate the press machine mechanism which basically is a pick and place system. We were able to give in our inputs over the next week or so, but the project was not concluded completely.

PS-I experience: Overall the PS-1 experience was fairly good. I had Domtech R&A as my 3rd or 4th priority, since I wanted to try out more of the robotics/automation side of mechanical and they had that right in their name. I actually did not expect a design job but I liked it to be honest. I had been trying to learn CAD over my 2nd year and this project provided a major boost since it had a particular goal, deadlines and stuff. The initial 2 weeks were difficult but I was able to work on Fusion360 comfortably after the initial hiccup.
The company mentor was also helping and he tried to meet at least once a week in the first 3-4 weeks and kept deadlines forcing us to work and complete the tasks in time(in a good way obviously).
I think the work was given regularly in the first few weeks in contrast to many other stations, so that's a pro or con depending on what we expect out of PS1 - an easy A or work experience. I wanted the experience and so did my teammates, so it panned out well.

Learning Outcome: The experience helped to get a grip on CAD, I am fairly comfortable with Fusion360 now, I got to try out simulations as well on Fusion. This was also an opportunity to put what we learnt in previous semesters to practical use. It also helped to improve my communication skills since we worked as a team for the project.

Name: AKSHAY GHANSHYAM SHETH . (2019A4PS0797G)

Student Write-up

Short Summary of work done: Designed a 2 degree of freedom welding positioner to aid in automated welding. Calculated motor and gearbox requirements and optimized the design. Analysed structural loads and created a bill of material.

PS-I experience: Very well organised and interesting. The projects were captivating and they helped me think out of the box. The mentors were well spoken and helped us in every stage.

Learning Outcome: Learnt a log about CAD. Also learnt about balancing design and cost and figure of problems in realistic scenarios.

PS-I station: Engineers India Limited-Mechanical , Gurugram

Student

Name: BHANDARI ABHAY NAVIN KUMAR (2019A4PS0452G)

Student Write-up

Short Summary of work done: It was a vocational training program offered by EIL. I was allocated to the Fired Equipment Department, specifically in the steam generation sector. I understood how crucial fired equipment like - Boiler, Heat recovery steam generator, Sulphur recovery unit and many other auxiliary equipments work and their application in various industries. Detailed Engineering drawings of these equipments, how to read them, conventions followed in the Industry were significant learnings. Some basic Heat transfer calculations were also done to support the theory.

PS-I experience: My experience was overall satisfactory, and I gained vital learnings both in technical and soft skills. Since it was online, more focus was only on theory or otherwise there is a lot to be learned about practical field too. Also, it is not precisely an internship but more of a program where you need to apply basic knowledge gained through courses and try to relate with real equipments in the Industry.
More important for me was the exposure I got by interacting with various personnel of the organization.

Learning Outcome: The several meetings or learning sessions with the industry mentor were very productive in terms of Industrial Knowledge. I developed and enhanced skills (Technical as well as soft skills) such as
1. Theoretical knowledge of machinery, techniques and research done in Industry.
2. Efficiency in communication and quality of research needed
3. MS Office (Documentation & Presentation)
4. Communication, Presentation and GD Skills.

Name: SRIDHARA SAI GOPAL . (2019A4PS0544H)

Student Write-up

Short Summary of work done: I was allotted the Static and Machinery Equipment Department (SMED) within the technical directorate at EIL.
The title of my project was “Analysis of equations provided in Appendix-2 of ASME Section VIII Division 1”. ASME Section VIII Division 1 is a popular Boiler and Pressure Vessel Code (BPVC) that is used in industries (especially hydrocarbon based) worldwide. Appendix-2 of this handbook enlists the rules for Bolted Flange Connections with Ring Type Gaskets.
These rules are nothing but formulas (or equations we may say) essential to the design of flanges-a vital equipment in the oil & gas industry. My work was to “derive” these formulas by considering the cross sections, design aspects involved.
Design of a flange included determining the load that was to be applied by bolting, considering the operating conditions and gasket seating conditions. Then, the moments working on the flange due to various axial forces was calculated. Minor details like empirical relations of bolt spacing, gasket & bolt dimensions and their selection etc. were also found. Later, various stresses acting on the flange were elaborately derived. This was a major milestone in this project. Finally, few other minor details like allowable stresses, flanges under external pressure were considered.
Apart from this, I was given Vocational Training by EIL officers in the three sub divisions of SMED-Package Equipment, Rotating Equipment & Static Equipment. Training was given through Google Meet lectures of 2-4 hours every day for a total of 6 weeks (2 weeks each for the three sub divisions).

PS-I experience: My PS-1 journey at EIL was very fruitful-full of learning opportunities literally every day. My company mentor was a senior officer at EIL with decades of industry experience. His industry insights were invaluable for me. I communicated on a regular basis with my guide at EIL who gladly helped me whenever I was stuck at any

point in the flanges project. I had to refer to many textbooks on the topic for learning purpose. All the Vocational Training instructors (13 of them in total) were well qualified engineers having an industry experience of at least 12-14 years. Thus, the clarity and depth of their lectures was enriching for me. They were able career counsellors as well. Overall, PS1 at EIL was a memorable experience.

Learning Outcome: I learnt in depth about the design of integral type bolted flanges and their applications. Vocational Training imparted industry relevant knowledge on an array of topics like HVAC, material handling equipment like cranes, filtration equipment, compressors & pumps, steam & gas turbines, pressure vessels, heat exchangers (shell & tube type, air cooled) and storage tanks.

Name: GANDHI SHUBHAM PARAG . (2019A4PS0610G)

Student Write-up

Short Summary of work done: My project at EIL was a study project about Fired Heaters. I researched about the use and operation of fired heaters in the industry. I studied about auxiliary equipments used in a fired heater and selection of material of tubes inside the heater based on the temperature requirements. Also got to know how different methods are used to increase heater efficiency, air preheater being one of the most commonly used system used in the industry.

PS-I experience: PS-1 was an overall good experience. I gained valuable knowledge from industry experts and the PS faculty. Industry insights from industry professionals and experts helped greatly in understanding the functioning of the industry.

Learning Outcome: API Standards for fired heater, Auxiliary equipments of heater, Analyzing technical drawings of large assemblies, apart from technical skills some soft skills like presentation skills and time management.

Name: ARVIND VERMA . (2019A4PS0770H)

Student Write-up

Short Summary of work done: In EIL I was allotted in SMED(Static and Machinery Equipment Department). In that I was given a project on detailed study of Air Cooled Heat Exchangers (or Air Coolers) and Pressure Vessels and their designing. Some study materials were being provided by the my mentor and some new softwares were demonstrated on how to use them for designing.
Apart from the project I was given general idea about different equipments in the department through webinars by the company.

PS-I experience: Great experience, got to learn a lot and had an invaluable learning experience.

Learning Outcome: I got to learn how the industry works, how professionals conduct themselves. I can say that it was a wonderful experience which will definitely help in my future endeavours.

PS-I station: Gates India Pvt Ltd-Mechanical/Manufacturing , Chandigarh

Student

Name: AVINANDAN NAG . (2019A4PS0550G)

Student Write-up

Short Summary of work done: We learned the basics of visual basic and made a user form for Kaizen Card, making the user form more visually appealing and making the user interface more interactive. Also, conversion to PDF and emailing to a particular mail id was done.

PS-I experience: It was amazing and fun to learn. We interacted with few students of Pilani campus too.

Learning Outcome: Complete learning of Visual Basics in Excel and deep insight about the company

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PS-I station: Grasim Industries Limited-Chemical (Unit process & operation) , Nagda

Student

Name: DIVYANSH KASHYAP . (2019A1PS0937G)

Student Write-up

Short Summary of work done: Learnt about industrial advancements in Auxiliary department of Grasim. We also learnt about various equipment and learnt how to improve their efficiency.

PS-I experience: It was a great learning experience. Although PS-1was online, the exposure was good and I got insights into how organizations function. I also learnt how bookish knowledge isn't sufficient in finding solutions to real world problems and how important it is to manage working and personal life in order to grow as an individual.

Learning Outcome: PS-1 imparted me with practical skills and helped me gain knowledge of chemical industries through well-qualified mentors. It improved my communication skills and helped me establish newfound confidence in myself and my abilities.

Name: YUVRAJ SINGH LATHAR . (2019B2A10941P)

Student Write-up

Short Summary of work done: Work done on Viscose fibre and improving its quality. There were weekly meets organised by the IC to track out progress

PS-I experience: The experience was decent. We got to know how a firm works, and most importantly what how a private firm supports its work force. The support we got from Grasim was also decent.

Learning Outcome: I learnt a few things about Viscose fibre and about the administration of the firm Grasim

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PS-I station: Grasim Industries Limited-Mechanical (Energy Management) , Nagda

Student

Name: TARA SHANKAR TRIPATHY . (2018A4PS0286P)

Student Write-up

Short Summary of work done: It is all mentioned in my report but basically we were assigned research tasks, some data processing, brainstorming improvement to the existence process etc.

PS-I experience: It was great. Learn a lot. Did research, worked on solutions etc.

Learning Outcome: ZLD is the future of ETP.

Name: SANCHIT TIWARI . (2019A4PS0742H)

Student Write-up

Short Summary of work done: Being a part of the plant maintenance group at Grasim Industries Nagda, I developed proposals for introduction of IoT techniques for Predictive Maintenance of plant to improve energy efficiency while utilizing nondestructive testing technologies such as infrared, acoustic (partial discharge and airborne ultrasonic), corona detection, vibration analysis, sound level measurements, oil analysis, and other specific online tests.

PS-I experience: It was the best industry exposure one could ask for. Being from mechanical engineering , the online semester made it difficult for us to have hand on experience but the PS station at Grasim and my instructor and industry mentor were very helpful and resourceful finding new and innovative techniques to impart their know how to us and pushing us to perform our best.

Learning Outcome: The project taught me a great deal about the core sector of mechanical engineering. From the topics ranging from viscose fiber production in which India is a world leader to finding different techniques for plant maintenance, the project contributed to an overall development of a niche for core sector.

Name: KUSH GAMBHIR (2019B1A41040P)

Student Write-up

Short Summary of work done: My project was based on improvements in effluent treatment plant in which I worked majorly on the efficiency of biological reactor. Our group also worked on other aspects of effluent treatment plant such as activated sludge

treatment, bioreactor design and zero liquid discharge process. Zero liquid discharge is an advanced water treatment technique where all water is recovered and contaminants are reduced to solid waste. We accomplished this by analyzing the data provided to us by our mentor at Grasim Industries.

PS-I experience: Our mentor and affiliated faculty were both cooperative and readily available for consultation or doubt clarification. My group members were dedicated towards the allotted project and contributed well to the completion of our project. The virtual mode of PS did not hinder our learning although I believe that onsite visit could have added to our learning more. The project allotted to us aligned well with our disciplines and provided us a real use case to apply the knowledge we have. Our mentor was also very knowledgeable and gave us tasks with easily manageable workload. Also, the webinars conducted throughout PS-1 were very informative and gave us insights of some essential tools that are used in the industry.

Learning Outcome: I gained insights of how my discipline's knowledge can be applied in the real world by using concepts of microbiology in biological reactor design and also how we can improve on the existing effluent treatment plant. Moreover, working on real data from the plant helped me reinforce my confidence in my technical skills. The presentations that we delivered enhanced my delivery skills.

Name: APOORV AWASTHI . (2019B2A41532H)

Student Write-up

Short Summary of work done: I was part of Mechanical Engineering group of Grasim Industries, Nagda and recieved a project on Effluent Treatment Plant and Zero Liquid Discharge . It was an interesting project with alot of research potential and one which is very much part of many physical industries.
I was part of a group of five and we learnt alot about real life indrustry knowledge during the PS-1. Our instructor regularly gave us topics to research and to create presentations to present between all groups present at Grasim . The topics ranged from general studies about Grasim Industries to in-depth research about Effluent treatment plants such as Chemical and Biological methods of Wastewater treatment , detailed study about biological reactors such as thier as efficiency and methods of improvement, detailed analysis of Zero Liquid Discharge Process , its use in Grasim and other major Enterprises , its efficiency and advantages and methods and improvement. We also had Group

discussions about various real life topics. It was a very enjoyable and unique experience .

PS-I experience: It was an interesting experience for me as it was an online PS which I thought was great and lot better than expectations from an online PS. I experinced doing research on real life topics , working on projects with strangers who became friends and giving presentations and generally taking part in the group discussions. It was a great experience.

Learning Outcome: I learnt about the challenges faced in real life industry , how to research and present in consise and clear way the data so as to make it understandable to everyone . I had fun taking part in the group discussions which helped me get confidence in speaking infront of others , the importance of deadlines and time management and coordinating with group memebers on the project . It was a great learning experience for me.

Name: ANSHULÂ SINHA . (2019B2AB0180P)

Student Write-up

Short Summary of work done: My project revolved around understanding the process, functioning and improvement of the Effluent Treatment Plant(ETP) for wastewater treatment at Grasim Industries and exploring the process of Zero Liquid Disposal(ZLD). Analysis and understanding about Activated Sludge Wastewater Treatment, its process enhancements and effectiveness improvement methods along with the design and efficiency of the membrane bioreactor was an integral part of my project work during PS-1.

PS-I experience: My PS-1 was an enriching experience through which I could gain valuable knowledge about the functioning and operations in an industry which is one of the flagship companies of the reputed Aditya Birla Group. I could learn about the products, manufacturing divisions,structure,hierarchy and financial aspects of Grasim Industries and specifically the complete working of the Effluent Treatment Plant(ETP) and the ZLD process. I also got the opportunity to learn about industry protocols,safety and etiquette. The group discussions and presentations conducted played a key role in aiding effective

peer learning and interaction. All this fruitful experience was made possible by the continuous guidance and support of our respected PS-1 instructor.

Learning Outcome: 1) Functioning of the Effluent Treatment Plant(ETP) and the ZLD process.
2) Industrial protocols, safety, functioning and operations in an industry.
3) Enhancement of qualitative and quantitative analysis skills.
4) Enhancement of speaking and presentation skills.

Name: SIDHARTH DINESAN NAMBIAR . (2019B3PS0604G)

Student Write-up

Short Summary of work done: Regarding safety at workplace and incident cost analysis

PS-I experience: Good

Learning Outcome: Learned to work together with peers

Name: MANAN MUKHERJEE . (2019B5A40716P)

Student Write-up

Short Summary of work done: Studying automation and instrumentation was the specified aim of the project, energy centers being the domain. The project was further categorized into several presentations covering different study areas. For our group, it first began with an overview of Grasim Industries. Next, we were made familiar with the concepts of Programmable Logic Control(PLC), Distributed Control Systems(DCS) for boilers and turbines, and valves and instruments used in an industry. Then, we went

deeper into similar topics and analyzed the use of PLCs for boiler control, process parameters for boiler control, digital control for steam turbines, steam turbine governing systems and instrument calibration. Lastly, the project culminated with the study of applications of PLC and SCADA in thermal power plants, ash handling systems in thermal power plants and methods used for protecting instruments from corrosion.

PS-I experience: As far as the overall experience is concerned, it was nice. However, the conduction of PS1 in the online mode seemed to lack the experiential and practical aspects of industrial learning. The learning is valuable, however it's true that it is only theoretical. Presentation skills, communication skills (through group discussions) and team work are the key areas where I find significant improvement in myself. Interaction with the faculty helped me learn a lot. Webinars which consisted of lecture sessions by experts helped me know a good number of things, including the working of many softwares and technologies. However, I still feel it would have been much better in the regular, offline mode.

Learning Outcome: I learnt a lot about the working of a manufacturing industry. What all processes and process parameters are crucial for running an industry, how is industrial load taken care of by automation and what all methods can be used for efficient management of energy in a manufacturing industry were the areas we worked on and learnt about. Specific to Grasim, the distribution of different boilers in various energy centers and the working of a wagon tippler were also studied.

Name: Riya (2019B5TS1255P)

Student Write-up

Short Summary of work done: Our project was based on the “Study of key equipment and automation in energy centers”.

PS-I experience: It was a nice experience overall.

Learning Outcome: Teamwork, Communication Skills, and how people used to work over industries in different sectors.

Name: LOKESH SAINI (2019B5TS1272P)

Student Write-up

Short Summary of work done: I got to know about grasim industries instrument measurement in energy centres, instrument calibration and instrument protection.

PS-I experience: My PS-1 experience was quiet fine, I learned how to do work in group and learned lot of things from industry experts webinar

Learning Outcome: I have learnt how to do group discussion and presentation

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PS-I station: Grasim Industries Limited-Mechanical (Safety and Enviornment) , Nagda

Student

Name: S ADARSH KUMAR REDDY . (2019B1A41054P)

Student Write-up

Short Summary of work done: Project Area: Effluent Treatment Plant and Zero Liquid Discharge Process
We received a detailed description on the Viscose Staple Fiber manufacturing process and a brief insight into the raw materials used. We also learnt regarding the market shares of GRASIM, its various branches, their initiatives and innovations.

Our project (in specific my work in the group)was basically on understanding the working of Effluent Treatment Plant(ETP), various types of ETPs and search for improvements that can be made and suggested for improving efficiency, cut down operational costs.

PS-I experience: It was really great. There was good team work in offer which made the project interesting and the work easy. Our faculty-mentor (Dr.Arun Maity) was especially very helpful. The station-mentor was also very co-operative and we found some of the initiatives taken by GRASIM Industries are very much eco-friendly and sustainable growth promising initiatives and innovations.

Learning Outcome: 1.Learnt regarding ETP working in an Industry
2.Improved my presentation skills and also learnt a lot through the seminars.
3.The webinars planned also helped me out to gain knowledge regarding many aspects of technology and also growth prospects for mechanical engineers in various fields.
4.Learnt how to cope up with the peers in a team and also succeed through teamwork.

Name: ARVIND SAINI (2019B3TS1260P)

Student Write-up

Short Summary of work done: I was in the safety group . I got to know about the safety measures like fire prevention, first aid after any accident , rules and regulations of an industry for a labour etc

PS-I experience: As it was online ps , I got to know many things about GRASIM industries limited. I got to know about its share trends , its safety measures , its management rules , its administrative hierarchy ,it's over all turn over etc

Learning Outcome: I have learnt how to do a group discussion and also learnt how to do a proper presentation.

Name: Pankaj Kumar Saini (2019D2TS1280P)

Student Write-up

Short Summary of work done: I have worked on different types of safety management tips and methods which are necessary in all types of industries.

PS-I experience: It was really a great experience for me working with company mentors and ps mentors, also with my friends team. I have worked on several types of safety management practices and got a good experience of professional life in companies.

Learning Outcome: I have improved myself in communication skills and learned about professional company communication. Also, it has increased my self confidence of expressing myself and thoughts in front of others as it is professional or personal.

PS-I station: Gujarat Cement-Civil , Kovaya

Student

Name: SAMRIDH SRIVASTAVA . (2019B3A20563H)

Student Write-up

Short Summary of work done: My project was related to advanced surveying equipment in which I was required to make a PowerPoint presentation about advanced surveying equipments. We used internet and some books related to surveying such as 'surveying by BC Punmia vol 1 and vol 2. I started my project with an introduction about surveying such as what is surveying and what type of work does a surveyor does such as decision making and field work collection. Then I mentioned about different categories of surveying and various types of surveys and also objectives of surveying. Then we mentioned briefly about the surveying instruments which were used in the past decades. And then we moved onto the surveying equipments such as EDM, theodolites, total station etc. I wrote first about EDM and it's basic principle involved through which we calculate distance. And

then I wrote about how to use EDM and then I wrote about types of errors which occurs while measuring with EDM. Then I wrote about auto level and digital level and how they can be used for leveling and about their accuracy, magnification and range. Then wrote about total station and it's basic principle and also about it's features. Then I made a diagram 9f total station and mentioned it's parts. Then I wrote about it's uses, storage and how to use it.Then I wrote about it's accuracy and range and also about the factors which influence working of total station. At last I wrote about GPS amd then gave the conclusion of my project.

PS-I experience: Learning experience was good for me as I learned new things such as about surveying and equipments used for surveying though as it was online we missed on field experience but still it was a good learning experience.

Learning Outcome: Learning outcome was that surveying is extremely important for planning and execution of any civil engineering project and total station and other equipments have improved accuracy and efficiency of survey outcome.

PS-I station: Hertztech Solutions Pvt Ltd., - AI/ML , Chennai

Student

Name: ROHIT SINGH . (2019A4PS0244G)

Student Write-up

Short Summary of work done: My Project during the ps1 at Hertztech Solutions Pvt Ltd AI-ML , Chennai was a Machine learning project about defect detection by siamese network. Our project is based on a deep learning model called Siamese network. It basically finds the distance between the two classes and tells us the similarity between different classes.A Siamese Neural Network is a class of neural network architectures that contain two or more identical sub networks. ‘Identical’ here means they have the same configuration with the same parameters and weights. Parameter updating is mirrored across both sub-networks. It is used to find the similarity of the inputs by comparing its feature vectors, so these networks are used in many applications.

PS-I experience: As i am from a non tech background i had a little less exposure to technology so it provided me a great opportunity to learn about machine learning and also sparked my interest in the field of AI/ML

Learning Outcome: these are the list of things that I learned:
python
keras lib in ml
machine learning
about improving performance

Name: ADDEPALLI N M PAVAN KALYAN . (2019A4PS0424P)

Student Write-up

Short Summary of work done: In initial few weeks we recreated and tweaked the code of image similarity estimation code. Then we built LSTM model with help of image estimation model. We collected sample datasets and trained our model.

PS-I experience: Initially it was very difficult to adapt to a startup culture because of online PS, but my mentor, groupmates and faculty helped me to adjust the changes quickly.

Learning Outcome: Got to know how to search for ML topics. Got to know how to find datasets, how to learn ML topics. Got more experience of a mechanical startup.

Name: V V RAM SHARAN . (2019A4PS0643G)

Student Write-up

Short Summary of work done: The project was to identify NVH issues in automobiles and their respective solutions. The specific focus area for the project work done is wind noise in automobiles. I identified many causes of wind noise caused in the interior cabin and studied them in-depth, focusing mainly on three areas: the space between the doors and body, the A-pillar region, and the side mirror. I reviewed many design solutions for the issues in these areas, and I have reported the better solutions after analysing them.

PS-I experience: My time working at Hertztech Solutions was delightful and productive. The mentors from both the university and the organization were very helpful and motivating. I learnt a lot about the structure of a startup working in mechanical field which will be very helpful for my future.

Learning Outcome: I learned how to analyse various design solutions and have improved my presentation skills significantly.

Name: RISHAB JAIN . (2019A7PS0124H)

Student Write-up

Short Summary of work done: The team developed a Siamese Network to do Nonlinear analysis for defect detection and image recognition. The Siamese Network is a powerful deep learning network which can learn from only a few instances and work efficiently. These Networks are widely used in face recognition applications in android and in other devices. This project can be used to find the similarities between the ideal machine parts and the non-ideal/ realistic part. If there is a slightest difference between the two beyond the permissible limits, the percentage similarity will help the user of this network to identify the portion of the automobile which is defective and needs to be replaced/repaired.

PS-I experience: It was a good learning curve for me to work with the company, the mentors and faculty allocated did help me through the two month time span.

Learning Outcome: Came to know the basics and details of Machine Learning since i was inexperienced in this domain of computer science. The mentors and faculty allotted helped our team timely whenever we were fixed in our approach and helped us to critically

think and explore details to add to our project. Overall it was a good experience and helped me learn how companies work for solving real life problems.

Name: AYUSH HIRANWAR . (2019B1AA1074G)

Student Write-up

Short Summary of work done: Understood the working of MusicVAE and LSTM encoders and decoders, variational autoencoders and how they used to learn a latent space. Made a sequential ML model to classify the raw Time Series data into 10 classes.

PS-I experience: It was decent.

Learning Outcome: I got introduced to deep learning and machine learning and used tools like Tensorflow, sklearn, Librosa, Pandas, NumPy, Matplotlib to build the model.

Name: MOTA PREYANK BHAVESH . (2019B4A70331G)

Student Write-up

Short Summary of work done: Making a generative deep learning model based on the 'Wavenet' architecture, which was capable of identifying sound anomalies in mechanical and electronic machines. This was done using python on Google Collab notebooks using various python libraries for data manipulation, music file manipulations and tensorflow to develop and train the model.

PS-I experience: The PS-1 was the first industry exposure and a very valuable one. It not only taught how work is done in a professional setting but how people communicate among themselves in a workplace. The company mentors and the faculty in charge were very helpful and available for any queries we had. The whole period had a great learning value to it.

Learning Outcome: The aim of my project was to create a deep learning model, so we learned a lot about different models that are out there and how different models are used for different types of data. To implement the model, we used the Tensorflow framework and for preprocessing and cleaning audio datasets for the models. For this tasks we used python libraries like music21, audio-to-midi and many others. While completing the project as a team, we learned about a lot of things related to the project and the different frameworks around it. It was a good learning experience overall.

Name: SHIVAM VIKRAM CHADHA . (2019B4AA0704G)

Student Write-up

Short Summary of work done: The Purpose of the project is to create generative models capable of identifying sound anomalies in mechanical and electronic machines. The company Hertztech Solutions Pvt. Ltd. provides a service giving recommendations to companies on how to reduce different unwanted vibrations from their vehicles and devices. Here it is important to know if certain implemented changes are increasing noise or decreasing them. With the advances in artificial intelligence, our objective can be achieved using deep neural networks. For this we chose WaveNet, a deep generative model of raw audio waveforms. This model is specifically designed to work on audio signals that require high precision. We used WaveNet to build a generative model of time-series. We used random datasets to test how well the model works and to know what kind of preprocessing audio files require before feeding them to the model.

PS-I experience: PS-1 was my first industry exposure and so was it was a very important program. Overall it was a decent experience. It gave a general idea about how stuff works in the professional world and how to work and communicate in such circumstances. The projects had a lot of potential but there were some gaps in understanding everyone's expectations out of the project.

Learning Outcome: Our project was on WaveNet, so our main learning outcome was how to implement it. Other than that we learnt about various things including Tensorflow, magenta, deep learning in general and audio data-processing.

Name: OM TAYAL . (2019B5A30707G)

Student Write-up

Short Summary of work done: We had to work on one shot learning method for image detection. We used a siamese model for the same. So after understanding siamese network our main job was to optimize the model. We used various methods for optimizing the model. Overall it was a good learning experience.

PS-I experience: My ps experience was quite good. I learnt many new things. Our faculty and mentors were very supportive and all the evaluations were carried out smoothly.

Learning Outcome: Learnt about siamese network and NVH technology used in automobiles. I learnt a lot about deep learning and neural networks. This surely helped to improve my knowledge.

PS-I station: Hertztech Solutions Pvt Ltd.-Manufacturing , Chennai

Student

Name: HARIHARESHWAR R . (2019ABPS0976P)

Student Write-up

Short Summary of work done: Assigned project was based on Noise, Vibration and Harshness analysis of IC (internal Combustion) and Electric Vehicles. Furthermore, issues related to Wind Noise was taken up. Research was done on five subtopics related to Wind Noise:- Generating Mechanism, Problems faced in current market, Design Solutions, Wind Tunnels and other testing methods, Simulations

PS-I experience: PS-1 formalities went smooth and I didn't face much difficulties. Introduction to organization and its hierarchy was clear and we immediately set to work. Both, mentor and faculty from PS station were available and responsive to help clear doubts and offer additional materials. Evaluative components were conducted as per schedule and in a timely manner.

Learning Outcome: I focused on Wind Noise aspect of NVH, especially dealing with Wind Tunnel testing and Simulation theory, although I did go through the Generating Mechanism and Design solutions. The Design Solutions were really informative and I learnt many ways in which a seemingly minor difference in design would bring about noticeable changes. Learning about Wind Tunnel and other testing methods helped me to get better acquainted with the procedures, development time, cost associated with each sessions, while I learnt about a new software where Fluid Theory and Vibration techniques would be merged to produce the desired results.

PS-I station: Hexanika-Mechanical , Pune

Student

Name: MUKHERJEE SASWATA . (2019A4PS0162G)

Student Write-up

Short Summary of work done: I was mainly involved in two projects, both of which were pertaining to automation. In the first project we had to build a solution which would automatically classify customer complaints into certain pre-defined classes of issues related to a particular product of the client company. The aim was to automate this complaint classification so that customer service could be made more efficient.
In the second project we had to build another classification model, this time to predict the action taken on a loan application by a financial institution. Originally 98 attributes were

used by banks to determine whether a loan would be approved or not. The aim was to make a predictive model for predicting this action taken. To make the model both accurate and computationally less expensive; a lot of feature engineering had to be done. By the end of my tenure I had built a working model for the task which had greater than 95% accuracy for new unseen data extracted from the company's database. Currently work is being done to integrate the model with the company's user interface to provide a user-friendly experience.

PS-I experience: A very enriching experience in spite of being a remote internship. The peers with whom I worked at the company were very friendly and co-operative. My senior colleagues were very approachable and always supportive. They always encouraged me to follow my instincts while working on the projects and were always there to cover for me when I made mistakes. I also had the opportunity to interact with many other people from other companies who were associated with the fintech field.

Learning Outcome: My learnings from this internship were both technical and non-technical. In the technical aspect, I learned a bit about natural language processing and techniques involved in implementing it, I became more confident in programming with python as both the projects I worked upon had to be coded with python from scratch. I also learnt some financial terms and their importance in determining whether loans should be approved or not in the U.S. Besides that, my non-technical learnings include teamwork, communication skills and presentation skills.

PS-I station: Hilti (India) Pvt Ltd. , New Delhi

Student

Name: MADEHA GULL . (2019A2PS0008P)

Student Write-up

Short Summary of work done: My project was to understand the different codes and standards used for retrofitting of masonry buildings and as a result draw comparisons between the Indian and International codes and suggest changes, if any, to the Indian Codes. As part of the project, I completely went through Indian codes like the IS 13935:2009, IS 13828:1993 and covered parts of IS 4326:2013, IS 456:2000, IS 9012,

etc. For the International standards, I covered relevant portions of the Eurocode 6, ACI 506, ACI 530, FEMA 547 and so on. Through these, I got to know about the various prevalent techniques for retrofitting, when they are used and how they are used. I then narrowed down my research to three topics for drawing the comparisons, namely shotcreting, connecting walls and diaphragms using ties and adding reinforcements to unreinforced buildings, and made comparisons between the Indian and International standards in the implementation.

PS-I experience: PS1 has been a great learning experience for me. Doing this project has helped me get a better and practical grasp on the concepts I have been learning throughout my courses in Civil Engineering. It has taught me how to dig deeper and come up with solutions on my own and helped incorporate a much-needed understanding on how things work in the real world. The continuous guidance, cooperation and support from not just our Faculty in-charge but also the industry mentors made sure that the experience was a smooth one. They participated in the project with just as enthusiasm as we did which acted as a huge motivating force. Overall, it has been a really enriching experience and I'm indebted to the Practice School Division for providing us with this opportunity. This project acts as the bridge between my theoretical and practical knowledge and is a memoir of my learning experience.

Learning Outcome: This project has been acted as a great starting point for me to learn about retrofitting and strengthening of buildings and will surely give me a headstart in case of any future endeavors in the domain. I've come to learn about many of the retrofitting techniques used not only in India but also internationally, and doing all this with the final aim of comparing the two made sure that I always looked at everything from a critical angle. It has helped incorporate skills of critical analysis and taught me how to dig deeper.

Name: KRISHNAVENI K RAGHAVAN . (2019A2PS0779H)

Student Write-up

Short Summary of work done: My work was on understanding the standards used for post-installed rebar design. Went through some documents to know in detail about post-installed rebar, parameters checked for its design and installation. I also had to compare specifications related to rebars given in IS 456-2000 and Eurocode 2. I arrived at a conclusion that Eurocode 2 was more efficient in development length and lap length

calculation than IS 456 by considering two typical cases. I learnt that there were some gap areas in IS 456 which should be taken up for further research.

PS-I experience: The project topic assigned was entirely new to me. So, I had to refer a lot to get a background knowledge. Biweekly meets were organised with industry mentors and faculty coordinator. In these meets, I presented my progress till date. They pointed out the shortcomings and gave suggestions for improvement. Also, other evaluation components were evenly spaced.

Learning Outcome: Got to know in depth about post-installed rebar connections. Learnt to systematically compare different design standards. I could work on improving my presentation skills.

Name: KURALLA JABILI LAASYA PRIYA . (2019A2PS0928P)

Student Write-up

Short Summary of work done: I had gone through various Indian and international codes for retrofitting of concrete structures and then drew some of the comparison among IS codes, ACI codes and EURO codes.

PS-I experience: I really gained a lot of theoretical knowledge by doing this project. Looking through various codes improved my understanding ability and this project was a memoir if my leaning experience. It has taught me to dig deeper and come up with solutions. I had tackled many problems and gained a lot of knowledge of how things work in real world.

Learning Outcome: It helped me gain both practical and theoretical knowledge. It helped me understand how real-world structures are built. It improved my understanding ability.

PS-I station: Hindustan Colas-Civil , Mumbai

Student

Name: HARSHIT PRIYADARSHI . (2019A2PS0909P)

Student Write-up

Short Summary of work done: I along with my teammate were given a task to learn more about Simple Performance Test for Superpave Mix Design and how these test methods were used in the laboratories to analyze the quality of HMA mix design.

PS-I experience: Since the PS was online there sure were few limitations but our mentor and faculty in charge were really helpful and guided us and helped whenever needed so that we can learn effectively.

Learning Outcome: I learned about various test methods that are considered under the Simple Performance Test and how are they used in the laboratories in the industries for quality testing.

Name: SIDDHARTH PRAFULL SANGHAVI . (2019A2PS1069P)

Student Write-up

Short Summary of work done: I had learnt about simple performance test on superpave mix design where initial phase of work the candidate test for permanent deformation , fatigue cracking and low temperature cracking were identified and validate for next phase of work.

PS-I experience: It was really nice working on this report as well as our mentor were extremely helpful.

Learning Outcome: We had learnt about different simple performance test on superpave mix design.

PS-I station: Hindustan Petroleum Corporation Limited-Mechanical , Mumbai

Student

Name: SANATKUMAR SAMVIT RAJAGOPALAN . (2019A4PS0390P)

Student Write-up

Short Summary of work done: Data research intern for the up and coming mutual fund analysis project. I did the ground work which included finding out the common criteria for ranking mutual funds and competitor research. I acted as a support staff for the industry mentors cross checking the changes and checking for any errors in the previously completed work.

PS-I experience: It was fun and informative. I got a feel of how it was to work in a professional atmosphere.

Learning Outcome: I learnt SQL and gained a lot of knowledge of Mutual Fund Analysis.

Name: SHOURYA TIWARY . (2019A4PS0477P)

Student Write-up

Short Summary of work done: The study captures the full list of lube blending plants in India. The technology employed in these lube plants and also the infrastructure.

PS-I experience: Very nice experience working with people having experience.

Learning Outcome: Overview of lubricants, types of lubricants, properties of lubricants and types of lubrication. Advantages and uses of solid, semi-solid and liquid lubricants, application of properties so that correct lubricants can be selected. Blending equipment such as agitators, grease manufacturing process. Learnings about blending technologies such as semi-automatic, fully-automatic, manual filling of container with lubricants, automatic batch blending and programmable logic controller. Lab accreditation and testing of lubricants.

Name: ANURAG GUSAIN . (2019A4PS0527G)

Student Write-up

Short Summary of work done: My project was "Use of Drone Technology to collect oil samples within India". It was a drone delivery project where an autonomous drone would be required to carry the oil sample from customer's location to the testing laboratory. I analysed the projects of companies already related to this field. Learned about supply chain management, then contacted drone vendors in India and set up a deal with HPCL managers to further carry out the project.

PS-I experience: My PS Experience was good. Learned new things different from my core field.

Learning Outcome: I learned how to analyse different projects. Learned about supply chain management and a lot about drones. Also learned about drone delivery in general. Overall it was a great learning experience.

PS-I station: Hindustan Petroleum Corporation Limited-Mechanical , Mumbai

Student

Name: VERMA DHRUV GAUTAM . (2019A4PS0529P)

Student Write-up

Short Summary of work done: Firstly I learned about Oil Condition Monitoring and read some research papers about the parameters included in the Oil Condition Monitoring. After that I completed a course “AI for Everyone” by Andrew Ng on Coursera. After completing this course, I decided to apply Machine Learning in this project. So, to learn Machine Learning, I started a course “Machine Learning” by Andrew Ng on Coursera. I completed the Supervised Learning part of the course. After completing 70% of the course, I asked my PS mentor for the data because the deadline for submitting report was approaching. The data provided to me was not enough and so, I was not able to complete my project.

PS-I experience: I had a wonderful experience throughout my Practice School-1. Although I was not able to complete the project because of the insufficient data and the shortage of time, still I learned many great things during my Practice School-1. I am really grateful to Birla Institute of Technology & Science, Pilani and Hindustan Petroleum Corporation Limited for providing me this opportunity. I am also grateful to my mentors and my PS Faculty, who helped me a lot throughout the journey and made my PS-1 really great.

Learning Outcome: I learned many things throughout my Practice School-1. Some of them are listed below:

- Oil Condition Monitoring and its all parameters
- Artificial Intelligence and its applications
- Machine Learning and some ML models in Supervised Learning
- Basics of Octave, MATLAB, and Python

Name: RUDRAVARAM LALYTH VENKATA SAI . (2019A4PS0554H)

Student Write-up

Short Summary of work done: Collation and analysis of all auto OEMs, their products - specifications, manufacturing plants locations, production capacity, market shares, yearly sales data, vendors and parts supplied, service stations, distribution geography wise. Collected all these data and analytics them.

PS-I experience: It was a great experience working at Hindustan petroleum corporation limited, although our PS was online but our mentors were very supportive.

Learning Outcome: Learnt what are all the leading OEMs in India, what are their statagies, products produced, where do they produce, etc.

Name: ARIHANT KRISHNA KUMAR . (2019A4PS0716H)

Student Write-up

Short Summary of work done: The major aim of my project was to analyze and evaluate trial data for 5 lubricant brands from HPCL. It essentially involved a thorough understanding of industrial trials done for lubricants, the workflow from the start of pitching a lubricant brand to a client industry to the final acceptance of the brand by the client, and the parameters that determine a lubricant's quality and good performance.
I initially worked with data visualization to improvise and create newer charts that would represent data in an informative yet easy–to–understand way, based on numerous graphs across different media, websites.
The major part was however inferring important conclusions about the variation of parameters of a lubricant and the significance of those trends in the process of trials and oil condition monitoring. For that, my mentor guided me in understanding the standards of lubricant testing, the types of tests performed in lubricants during these trials, and the importance of limiting values in controlling the performance characteristics.
Finally, conclusions and recommendations to test my overall understanding were made, at the ending of the project.

PS-I experience: The experience was okay. The mentor allotted to me was very knowledgeable and supportive of my learning endeavor. However, working remotely posed many limits such as issues in remotely connecting, although these were unavoidable as per the harsh pandemic situation.

Learning Outcome: I got to experience lubricants in a different light than just reducing friction and reducing losses: they play an important role in both insulation and corrosion protection of machinery they are present in, as well as also providing an efficient heat distribution to improve thermal lifetime of machinery.

Name: SREENIVASAPURAM KRISHNA PRAJWAL (2019A4PS0834H)

Student Write-up

Short Summary of work done: The project that i was assigned was to make a lubricant chart for steel industry. The steel manufacturing process and the machinery involved in it had to be studied in detail to access the type and amount of lubricant required. Suitable HPCL lubricants had to be recommended of the machinery after a thorough study of the available HPCL lubricants and its lubricating properties. The additives that had to be in the lubricants had been taken into account to ensure that the suggested lubricant perform in the conditions as anticipated.

PS-I experience: The project was not purely of mechanical domain, it had a sales aspect to it, as main aim of the chart was to ease the work of salesmen and their communication with the vendors and distributors. I had to work with the technician team to prepare this chart and hand it over to the Sales Engineers.

Learning Outcome: I learnt the processes involved in steel and iron manufacturing. Developed a clear idea of tribological problems in the industry and the kinds of commercial lubricants available. I also learned about the additives and important lubrication parameters and various Industrial standards

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Name: Tanushri Tripathi (2019B4A40617P)

Student Write-up

Short Summary of work done: Data collection on 2-wheeler OEMs and their models, analysis of lubricant requirements and recommendations, observing market trends in the 2-wheeler industry

PS-I experience: Good. The assigned mentors were helpful and encouraging and the project was a good introduction to the 2-wheeler industry

Learning Outcome: I learned about the major market players and market drivers of the 2-wheeler industry and the effects of evolving government regulations and advancing technology on the production and sales of 2-wheelers.

Name: GARIMA SINGH . (2019B5A41076H)

Student Write-up

Short Summary of work done: Manufacturing of tyres, types of rpos, ancillary industries, articles manufactured from ancillary industry, estimated potential

PS-I experience: My PS experience was pretty informative. It was more based on research. I expected it to be more of mechanical side but it was more of research.

Learning Outcome: I learnt about a lot about tyre market, manufacturing, industries, estimated potential.

PS-I station: Indian Institute of Petroleum-Chemical (Enviornment Engg), Dehradun

Student

Name: SHREEDHAR TODI . (2019A1PS0873G)

Student Write-up

Short Summary of work done: I have found the different parameters in which the reaction depends through reading of research papers and thesis as instructed by my instructor. Read about chemical kinetics that will be applied while calculating the dependencies of rate on the different parameters. I found out what are the bio wastes produced from different industries that go in the biogas digester. Found the main constituents of the major wastes of the oilseed crushing and pulp and paper industry. Solved problems from the book recommended by my mentor. The problems were based on finding the rate and order of the reaction from the given data. Applied linear, non-linear and multilinear regression on the data to solve the problems and find the parameters. I researched which type of reactor will be best for the process. Read research papers to find that CSTR type reactor will the best. I researched about the anaerobic digestion in CSTR reactors. Solved and analyzed the from CSTR data from the book recommended by the mentor to find the different parameters.

PS-I experience: The PS 1 experience at IIP Dehradun was great as I gained knowledge and skills of the field. Also got a chance to work under a scientist so it was amazing.

Learning Outcome: I learned a lot about conducting literature surveys and the evaluation components also helped in improving communication skills

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PS-I station: Indian Institute of Petroleum-Chemical (Unit process & operation) , Dehradun

Student

Name: KIRTI RAI . (2019A1PS0935G)

Student Write-up

Short Summary of work done: The project alloted to me was 'Development of Industrial Catalyst for the selective production of xylene from bio-derived glycerol'. As the PS was remote based, the project was carried out in a form of a research and was basically done by literature surveys and analysis. Xylene is an industrially important aromatic compound and is naturally obtained in fossil fuel resources and as the resources are constantly depleting, some other method is to be employed for the production of xylene. One such method is production of xylene from glycerol. Bio- derived glycerol is obtained as a by product in the synthesis of bio-mass and thus can be used for the synthesis of xylene. The process of conversion of xylene to glycerol was analysed in the project and properties of the HZSM-5 catalyst used were studied.To make the project more oriented in increasing the selective yield of Xylene, analysis were done and ways were suggested to improve the catalyst to increase the selective yield of xylene.

PS-I experience: It was a great learning experience, got to know more about how researches are carried out. It also helped me in improving my soft skills such as giving presentations, participating in groud discussions etc. Overall it was a good learning experience.

Learning Outcome: The project helped me in learning about the process of conversion of Glycerol to Aromatics, more about catalysis, and various other chemical reactions involved.I also developed many soft skills by participating in presentation and group discussions.

Name: SHRIRAM SUYOG JOSHI (2019A1PS1127G)

Student Write-up

Short Summary of work done: My PS work mainly consisted of doing a lot of literature review. The topic of my research was 'Chemicals and Petrochemicals from Waste Plastic'. In the first few weeks I had to collect data on how and where do different plastic wastes come from and how much ends up in landfills. This was mainly excel based data collection and analysis. After that I had to do some literature review about some of the patents and methods that are currently in use for plastic recycling and their feasibility analysis,..

PS-I experience: The PS was a good experience. The mentors were great and helped wherever needed. I would say that it being an online internship in a core sector the work done was very informative but would have been much more helpful were it offline.

Learning Outcome: I was able to learn a lot about how the polymer industry is heavily dependent on the petrochemical industry and also the burning need of new technologies to sustainable recycle plastic waste.

PS-I station: Indian Oil Corporation Limited-Chemical , New Delhi

Student

Name: KUMARESH MAJI . (2019A1PS0945P)

Student Write-up

Short Summary of work done: The work started with basic study of different refinery operations including various equipment like the distillation columns, the packings, reflux, etc. Then our project was on heat exchangers, we had to design a heat exchanger in accordance to the process data sheet.

PS-I experience: The experience was quite good, we had a meeting with our industry mentor Mrs. Asha Mangipudi where she explained us all the stuffs that was going on inside the refinery. She was a guide in all our endeavors, any technical snag we faced we

used to contact her and she would provide us with a way. Seeing the concepts that we have in our coursework come to life practically was something which had blown my mind.

Learning Outcome: Foremost, we learned about Crude Oil and its types; what are the basis of selecting a particular crude. We then shifted to refinery operations like the pre-treatment process, the distillation as a whole and also the types of distillation, next was cracking processes. So our main focus was on the technical aspects of the whole operation. Our project involved design of a heat exchanger and also another involved designing a network of heat exchanger. The design aspect of actual equipment based on real time data provided by our mentor that was actually being implemented had completely awe-stricken us.

Name: SATTI ROHITH REDDY . (2019A1PS1059H)

Student Write-up

Short Summary of work done: Worked mainly in the . He asked me to read about the Crude oil and its type and different types of refinery processes which are being followed for the production during the initial period. Then I worked on the analysis of the fouling factor and its effect, understanding of different types of pumps and controllers that are used in the industry, significance of different types of laboratory tests which helps in determining the what types of machines to be used based on outcomes of these tests.

PS-I experience: Had a good experience in the PS-1 . Our PS faculty helped us a lot in the initial stage of the PS and helped us to get comfortable to the PS like he used to keep us meets regularly and helped us in the problems faced by us . Industry mentor guided me to different types of topics and he helped me understanding on how the real industry is . Always looks forward to help whenever I couldn't understand a topic etc. Lot of things have been learned from him. He guided me very well based on the topis the I have learned in the2nd year.

Learning Outcome: Understood the difference between theoretical and industrial applications. Understood how a real industry operates like most of them will we automated.

Name: ANIMESH RAJPUT . (2019A4PS0769H)

Student Write-up

Short Summary of work done: The project assigned was "Overview of Secondary Distribution System in an Oil Marketing Company." Undertook extensive research in the domain of Supply chain management, and explored the different sectors of the Oil and Gas industry. The primary task was to identify the issues associated with the downstream distribution system of IOCL, and propose solutions for the same. Explored a variety of solutions, including the implementation of SAP and Blockchain to streamline operations. An understanding of terminal operations was found to be important for identifying discrepancies, and becoming familiar with the operation strategy of IOCL.

PS-I experience: It was interesting to get to learn about the working of such an esteemed company that has played a pivotal role in India's growth story. Although it would certainly have been better if we could have been at our PS station in person.

Learning Outcome: Greater understanding of supply chain management, distribution systems, and the crucial role that the former play in business operations.

Name: DIGVIJAY CHAKRABARTI . (2019ABPS0883P)

Student Write-up

Short Summary of work done: I worked at the Bijwasan Terminal of IOCL in New Delhi, along with four other BITSians from Mechanical and Manufacturing engineering, under the mentorship of a professor from BITS Pilani and an official from IOCL.
Our group worked on analysing the Secondary Distribution System of Oil Marketing Companies, specifically IOCL. This included identifying bottlenecks in the downstream supply chain, streamlining information, suggesting solutions such as cost-cutting techniques, and implementing mechanisms to solve the issues of unproductive depots.

The broad themes of the project including operations, logistics, and supply chain management.

PS-I experience: Despite an initial delay in the allocation of projects, the general experience was very smooth and the learning process was enjoyable. It was difficult trying to adapt to working online but the mentors from the institute and the company were very helpful.

Learning Outcome: I learnt how to understand nuances of various stages of a supply chain in the oil and gas sector, and how to solve issues faced by companies in this domain.

Name: MANAN MANGAL . (2019B1A41035P)

Student Write-up

Short Summary of work done: Our project was to analyse and suggest what all safety measures can be installed at a new terminal of IOCL. We researched and from the previous hazardous incidents that took place we found out what was the actual cause for that incident to happen. And we suggested the measures that could be implemented so that future accidents can be prevented.

PS-I experience: My experience with PS-1 was a good one. Initially when we started with the internship we hit some breakers but with time everything became more clear and fun.

Learning Outcome: PS-1 was a great learning opportunity for me. It helped me improve myself not only academically in terms of knowledge and facts but also as a person. It made a better team player. The GD's that we had showed me how we can think of many solutions to a problem and the presentations helped me improving my presentation skills. I learned how to research properly on a topic and most importantly how we should manage our time to meet our deadlines.

Name: PRANNOY CHAND . (2019B2A40993G)

Student Write-up

Short Summary of work done: We prepared a presentation and report on the topic "Fire Safety and OISD Guidelines at IOCL" .

PS-I experience: I got to work with like minded individuals on the topic of Firefighting and Safety related guidelines. It was a highly fruitful experience wherein we got to lean about various technical terms and fire related accidents that have happened in the past. Together with my team members we assessed the necessary changes needed to be made in the already existing firefighting guidelines mentioned by IOCL. We also had many group discussions and presentations on various topics like "Green energy" and "Blockchain".

Learning Outcome: It was a great learning experience. I got to learn about various firefighting terminology and techniques needed to improve them.

PS-I station: Instrumentation Solution - Civil , Gurgaon

Student

Name: VIBHU DHANDA . (2019B4A20685P)

Student Write-up

Short Summary of work done: Discussion, research and gaining knowledge about feasibility, challenges requirements and dangers during and after construction of Offshore Wind Farms.

PS-I experience: Overall nice experience
I got to learn about a few responsibilities I have as an intern and the responsibilities the organisation and institute have towards the project so that it moves forward properly.

Learning Outcome: I learnt a lot about Offshore Wind Farms.

PS-I station: JSW Energy-EEE (Control room remote operation) , Vijayanagar

Student

Name: RIYANSH CHATURVEDI . (2019A8PS0342P)

Student Write-up

Short Summary of work done: The project was to predict the ideal values and critical parameters of the turbine by developing algorithms based on statistics/AI.
We first studied the working principles of turbine and the generator along with some basic knowledge about the functioning of the power plant. Then for data analysis we have used regression analysis which was the base of our project. We used the Gradient Boosted Tree(GBT) algorithm along with ML libraries of Pyspark, matplotlib ,numpy and pandas for data processing mathematical modeling and representing the data.
The program takes the data in a special form and then it performs complex GBT regression and graph plotting to give predicted values of the temperature in the generator slots.
It can further be noted that the predicted values are pretty much accurate as the RMSE values are in the range of 0.35-0.5 and R-squared values in the range of 0.95-0.98.

PS-I experience: We PS-1 experience was pretty good and enjoyable we learnt a lot during the process and since JSW is an industry leader in power generation we got to know more about current industry practice, however the interaction with the industry mentors was limited due to their hectic schedules.

Learning Outcome: We learnt a lot of things spanning the domains of mechanical (Power plant and turbine operation), electrical(Generator functioning) and Machine learning(Various libraries and algorithms) along with a lot of soft skills like team work, work division ,time management etc.

PS-I station: JSW Energy-Mechanical (Turbines) , Vijayanagar

Student

Name: AKARSH SRIVASTAVA . (2019A4PS0545G)

Student Write-up

Short Summary of work done: The project to "Predict the ideal values and critical parameters of the turbine by developing algorithms based on statistics/AI" helped to understand different methods of Machine learning and how we can predict the values using some algorithms. Here we have used regression analysis which is the base of our project. This project represented the Machine Learning Approach for predicting the Slot temperatures of generators by using the Gradient Boosted Tree(GBT) regression and MlLib pipeline. Now, we can conclude that from the raw data given to us, we were able to inculcate it in a way that the program could understand . The program takes the data in a special form and then it performs complex GBT regression and graph plotting to give predicted values of the temperature in the generator.

PS-I experience: The projects provided by the company were research oriented which was followed by assistance from the faculty which helped us to learn Machine Learning, Statistics and AI to apply it further for the project. There was limited interaction with the industry mentors possibly due to the online mode of the PS-1 and also the limited working capacity at the plant.I would recommend the following station if one's interested in a research oriented industrial project and the similar projects are offered in the future.

Learning Outcome: I learnt python programming, MATLAB, Machine Learning(NumPy, Pandas and PySpark library). Among the soft skills, I was able to hone my presentation

skills and the group discussions helped a lot to be comfortable in professional/formal settings. Overall, it has been a really nice learning experience.

PS-I station: JSW Steel-Chemical (Hydrogen technology landscaping) , Vijayanagar

Student

Name: ASTITVA KUMAR GUPTA . (2019A1PS0694P)

Student Write-up

Short Summary of work done: Our project was on Hydrogen Technology Landscaping. We had to study about various technologies by which hydrogen can be produced at an industrial level and can be utilised for steelmaking, along with suggesting the most suitable technology which JSW Steel can adopt in near future.

PS-I experience: The experience was quite good, I got to learn a lot. The work was quite heavy as a lot of research and literature study was required. The mentors were supportive and helped us throughout the project.

Learning Outcome: I learnt various methods of hydrogen production along with their qualitative and quantitative analysis. I also learnt about the existing and developing hydrogen utilisation technologies for steelmaking and the various challenges that steelmakers throughout the globe face.

Name: PARAG SINGH . (2019A1PS1124G)

Student Write-up

Short Summary of work done: I worked on hydrogen technology landscaping in an integrated steel plant, wherein I had to find out various methods of production and utilisation of hydrogen in a steel plant and finally suggest the best method that is viable for use in the Indian market and which JSW steel could use in its industries.

PS-I experience: It was a good learning experience.

Learning Outcome: Learnt about the processes occuring in a steel plant and the future of hydrogen technology.

Name: PRANAV PRAVEEN NAMBIAR . (2019A1PS1401H)

Student Write-up

Short Summary of work done: We were tasked with landscaping hydrogen technology for use in an integrated steel plant. What this entailed was collecting as much information as was currently available for 1) the production and 2) the utilisation of hydrogen in steel making industries. after hours of searching and surveying literature on these topics, we ended up with 26 different production methods and 13 utilisation methods. We had to present this information in a tabulated format along with their pros, cons and cost details. Finally, after the data compilation was done, we were asked to suggest one production and one utilisation method from or list that was the most efficient with respect to both cost and product yield, and which JSW Steel can look into for future initiatives

PS-I experience: It was a very insightful journey for me, as I gained an in depth knowledge about the various aspects of the hydrogen sector. I had a very cordial relationship with my teammates and my mentors and it was through our combined efforts that this internship proceeded smoothly and efficiently.

Learning Outcome: I learned in detail about the processes involved in a steelmaking industry in general, and the significance of using hydrogen as a greener alternative in these processes in an effort to achieve carbon neutral steelmaking in particular

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PS-I station: JSW Steel-Computer (ANN) , Vijayanagar

Student

Name: ARJAV GARG . (2019A7PS0068H)

Student Write-up

Short Summary of work done: Testing the mechanical properties of hot rolled steel coils is time consuming and expensive. Therefore, a prediction model for the properties was required. We tested various ML models like ANN, CNN, GBM and RF.

PS-I experience: I got to work with students from other campuses. The industry mentor was knowledgeable and very helpful. Overall a great experience.

Learning Outcome: I learnt to use various kinds of Machine Learning Algorithms, while testing them out on real world data. This has given me a good exposure to and intuition about their practical usage.

Name: ARYAN SHRIDHAR KOLHAPURE . (2019A7PS0094G)

Student Write-up

Short Summary of work done: The objective of our project was to Predict the Ultimate Tensile Strength, Yield Strength and Percentage Elongation of steel from the hot rolling process using 26 available params.
Before attempting the prediction model using ann we were assigned to test it with Multiple linear regression. This model also provided a base/benchmark for the main ANN model. The MLR model showed an accuracy rate of 95,90,75 for UTS, YS and PE respectively.
Although we were provided with complete data/without null values.
We were still forced to use data preprocessing methods. Firstly label encoding was done for non-numeric values, feature removal using correlation heatmap, then to remove unwanted features mutual information was employed.
Then we tried other various algorithms to identify which works best.

While MLR fits data to a straight line SVMs fits data using much more complex structures. For training Support vector regression on our data, we have used the RBF kernel with degree 8. Gamma has been set to auto and will be determined by sklearn itself. We got decent results but the model could not perform better than linear regression, which we are using as a benchmark model. Then we tried XGboost. The method of gradient boosted trees, uses decision trees for prediction. For a regression problem like ours, Then we tried ANN. But it seemed that XGBoost worked better for that data. So we finalised and submitted that model to the industry

PS-I experience: Got to experience the work close to the industry.

Learning Outcome: 1. How to be better team player. and coordinate with others
2. pandas Library
3. learnt algorithms like
    a. MLR
    b. ANN
    c. XGboost
4. Various data preprocessing methods and working
    a. Chi squared test
    b. Mutual information
    c. correlation

Name: KSHIRSAGAR SHREYAS SUBHASH (2019B3A70562G)

Student Write-up

Short Summary of work done: One of the processes of manufacturing steel is the hot rolling process. We made a machine learning prediction model to predict the properties of the metal using the data relating to the previous processes such as composition used.

PS-I experience: It was great! Our industry mentor Pranav sir was incredibly helpful. Throughout the project it was a great learning experience to work on challenging real life datasets.

Learning Outcome: We got to know a lot about real life use cases of machine learning and how to tackle challenges faces when testing and tuning various machine learning models.

Name: RANADE CHINMAY ANIRUDDHA . (2019B4AA0790G)

Student Write-up

Short Summary of work done: The task was to build a deployment-ready property prediction model for hot rolled steel.
Various algorithms were tested; including but not limited to neural networks to predict the parameters Ultimate Tensile Strength (UTS), Yield Strength (YS) and Percentage Elongation (%EL). These predictions were done based on 23 features from the dataset provided by the industry mentor. We used R2_Scores as a metric to discover than Gradient Boosted Trees (XGBoost) delivered the best results.

PS-I experience: The Internship experience was smooth and result oriented. Working in a group of 4 likeminded students helps emulate an actual workspace environment in spite of the Work-from-home nature of the internship.

Learning Outcome: The internship was not only application of our knowledge, but learning new approaches and applying them. We learned about Neural Networks (ANN and CNN), Support Vector Machines, Random Forest, Gradient Boosted Trees, etc. Apart from the academic knowledge gained, we also learned teamwork and effective communication. Overall, the internship was a great learning experience.

PS-I station: JSW Steel-Computer (ML) , Vijayanagar

Student

Name: KANISHQ KHANDELWAL . (2019A7PS0037G)

Student Write-up

Short Summary of work done: We team of 3 at JSW steel, developed a Machine learning model for pellet prediction in the process of steel making, we first pre-processed our data removed outlier dataset,handled missing values and feature selection then used different ML regression techniques for model development Random Forest Regression XGBoost Regression Artificial Neural Network, we didn't get satisfactory results with Random forest and XGBoost but we finally got good results with ANN, we validated our model over different metrics

PS-I experience: PS1 came out to be a great opportunity for me, got industry experience, got to meet people from the industry, there were few challenging tasks which with the help of mentor, teammates and hard work was able to complete, my experience was full of learnings.

Learning Outcome: I got to know about how things work at industry level, how a massive steel industry works, got to explore machine learing and how it's applied in an non tech field of steel making, how ML models helps to predict the best pellets compositions.

Name: HRITHIK NAMBIAR (2019A7PS0100G)

Student Write-up

Short Summary of work done: The goal of the project was developing a Machine learning based pellet property prediction model. The Iron ore pelletizing process consists mainly of three steps: raw material preparation; green pellet formation and the in-duration process; these three steps include lots of controlling parameters. The process and operating parameters strongly influence the quality of the product pellets. Because of the dynamic nature of the process it is not easy to control and maintain the desired pellet quality. Therefore, modeling of such processes is very much needed to reduce the cost and time required for optimization of the process. Cold compression strength (CCS), Tumbler index (TI) and Abrasive index (AI) being the important strength properties of pellets, are key to the improvement and optimization of the pelletization process.
This problem is a Multi output regression problem. We tested the metrics given by models such as Random Forest,XGBoost and ANN, and further developed the model giving the best results.

PS-I experience: To sum it up, it is a good project for someone who is new to the field of ML, since my work was relating to a regression problem. The team at JSW initially kept lectures to introduce us to the field of steel making. We had a mentor from JSW, who made the work plan for us, this helped us a lot. We did not have regular meetings, but the mentor would clear all the doubts when raised and we did not have a strict deadline for the intermediate tasks.

Learning Outcome: Methods dealing with data imputation and other pre-processing techniques, which are often overlooked whilst learning the field. It was a different experience dealing with the real world data, and contributing to a relevant topic in the industry. A wider perspective about the influence of ML in other industries such as the steel-making industry. A deeper understanding about ML algorithms such as Random Forest, XGBoost and ANNs.

PS-I station: JSW Steel-Computer (Property prediction model) , Vijayanagar

Student

Name: SAARTH JHAVERI . (2019A8PS0669G)

Student Write-up

Short Summary of work done: Made property prediction model of electric steel using machine learning algorithms, used different kind of regression models like SVM,Randomforest,ANN,etc, and deployed the model using FLASK for the workers of industry to use it for predicting the accuracy of the steel.

PS-I experience: Learnt many new technologies like ,flask,django, and few machine learning algorithms also had few interaction sessions with other groups and got in hands experience of the industrial work

Learning Outcome: Technolgies- flask, django,regression models and some leadership skills

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Name: AMISH GUPTA . (2019B5AA1386H)

Student Write-up

Short Summary of work done: We had to deploy various machine learning algorithms to predict the properties of steel and then compare the accuracies. We also have to make a simple web app to deploy this and also had to clean the raw data.

PS-I experience: It was nice, great learning experience. I would call it a proper industrial training.

Learning Outcome: Learned various algorithms, python libraries, got to know things about data anaylsis

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Name: AMISH GUPTA . (2019B5AA1386H)

Student Write-up

Short Summary of work done: it was about making prediction ML algorithms to predict the properties about electric steel.

PS-I experience: Learning and not hectic.

Learning Outcome: prediction algorithms and libraries in python.

PS-I station: JSW Steel-Mechanical (Ansys simulation model) , Vijayanagar

Student

Name: GANDHI MIHIR RAHUL . (2019A4PS0438G)

Student Write-up

Short Summary of work done: In the beginning we were given a brief introduction to Iron and Steel making processes. My project topic was "Tensile Testing using Finite Element Analysis". Initially I did a thorough research on how tensile test has been simulated using FEA over the years. After this I used ABAQUS to create a model of the tensile test and compare its results to the data provided by JSW Steel. Many modifications were made to the model over the course of the internship to converge the results of the model with experimental results.

PS-I experience: It was a great learning experience and even though it was conducted in an online mode, we got a decent feel about how an industry works. My industry mentors were very responsive and particular about work, conducting weekly reviews to get updates. My PS1 faculty too, was very helpful and he guided us throughout the project.

Learning Outcome: I got a fair understanding of the steps involved in making a Finite Element Analysis Model and its execution to get satisfactory results. I learnt how to use a new software - ABAQUS. Other outcomes include improved soft skills

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Name: POORAV JADAV . (2019A4PS0529G)

Student Write-up

Short Summary of work done: We had to make an Abaqus simulation for the tensile test for 2 grades of steel. In this work it is envisaged to prepare a FEM based simulation model using Abaqus for carrying out a tensile test for 2 different grades of automotive steel. The details of the steel grades and formability parameters will be provided by JSW Steel. In the end model validation can be carried out for the same grades using actual testing data.

PS-I experience: I would recommend this PS station for mech students who want to learn softwares like Ansys and Abaqus

Learning Outcome: Overall, the experience was very good: helped in enhancing the presentation and communication skills, working with Abaqus, interacting with company personnel.

Name: KARTHIK SUBRAMANIAM . (2019A4PS0602P)

Student Write-up

Short Summary of work done: Made a model to run tensile tests on abaqus

PS-I experience: It was busy and informative

Learning Outcome: Learned finite element analysis

PS-I station: JSW Steel-Mechanical (Optimization technique) , Vijayanagar

Student

Name: CHADARAM AKASH . (2019A4PS1321H)

Student Write-up

Short Summary of work done: Work given to us is based on excel.We are given a set of data points and we performed regression analysis and also output predictor for the given input is done.Literature review on ball mill in order to increase it's efficiency is studied.And how grinding media can be optimized to get desired quality pellet.

PS-I experience: The work given to us is regression analysis and to prepare output predictor.There was no pressure or strict deadlines from faculty or mentor.Working with employees in jsw steel helped us to learn a lot.Came to know how Iron and steel are manufactured , and even ball mill and it's applications in grinding.It would have been much better if it happened offline.But keeping the current situation we managed to finish the project and had a great experience in working under professionals.

Learning Outcome: Microsoft excel (Regression analysis), Soft Skills.

Name: GUTALA AKHIL . (2019B1A41115H)

Student Write-up

Short Summary of work done: Our project work is about optimization of grinding media in ball milling operation. Ball mill is a machine that was being used to produce fine homogeneous powders of nanometric sizes from bulk agglomerates. It uses the grinding media inside a cylindrical body to grind the agglomerates into fine powders. The project work includes having a brief literature review of ball mill operation and its different applications,studying different parameters like online sinter fines, density, sinter products, feed rate etc. that are involved in generating output values of sizing cyclones with different micron sizes such as -10, -45, +150 etc. The data containing different values of parameters and their specific output value of each micron size was being provided and analysis was done using Regression Analysis. From mathematical perspective, there are 16 parameters and one output value that varies w.r.t to these parameters. Regression

analysis was done and the regression analysis table was being studied to make a model that can predict the output value, if values for necessary parameters were being provided. By this method, a model was being generated for each micron size and the validity of these models was being studied by used the data of actual output values with the help of graphical analysis.

PS-I experience: We had a great experience of doing the project in the PS1 Station as it gave us the first-hand experience of industrial workspace and environment, the planning and organizing of various machine and their operations, the organizational culture etc. We were being mentored and given directions on working the project as a group to achieve desired results.

Learning Outcome: - First-hand experience of working in an industrial workplace.
- Regression analysis of data provided.
- Designing different models that can predict the output from the values of parameters provided and comparing the models with the actual values using graphical analysis.
- Writing scientific report on the project work.

PS-I station: Knowzies Technology Solutions-Mechanical , Pune

Student

Name: PRIYANSHU SHUKLA . (2019A4PS0558P)

Student Write-up

Short Summary of work done: Researched about various things like Customer Training, Active Directory, Single SIgn-On, etc and made presentations weekly on various topics like- new features that can be added in an LMS, Usecase of AI/ML in improving an LMS

PS-I experience: My experience in Knowzies was good. The Industry Experts were extremely helpful and frank and it was quite fun to work with them

Learning Outcome: I got to learn many different topics while I researched for my tasks like what Active Directory is and how it works.

Name: AMOGH SINHA . (2019B2A40898G)

Student Write-up

Short Summary of work done: I integrated the Yammer tool in their ecosystem and managed it to get more engagement.

PS-I experience: My PS experience was nice. The superiors were very friendly and I had a lot of deep conversations with them.

Learning Outcome: I learned the importance of team work and discipline and I am very glad that I get to work here.

PS-I station: Madras Mindworks Pvt Ltd -Mechanical , Chennai

Student

Name: NAVNEETH P SAGAR . (2019A4PS0173P)

Student Write-up

Short Summary of work done: My project was to make an Object Detection Model to Detect and Identify Hazards in the Environment. For this project, I used Machine Learning and Neural Networks to develop the model with the help of TensorFlow.

I learned about Machine Learning, Neural Networks, Python, TensorFlow by going through online courses and online materials. For image collection, I used an online database and images from my Computer.
The whole process of collecting data, processing the data, training the model, evaluating the results, and freezing the model was done using a Python programming language.
After freezing the model, I made an app to run the model on the mobile showing the position, name, and confidence of the detected Object.
The two models created had Average Precision of 0.840 and 0.801 and Average Recall of 0.85 and 0.828.

PS-I experience: The Company deals with Augmenter Reality, Virtual Reality, and Mixed Reality technology. We learned about these techniques and learned the different use cases of these technologies in our field of interest. The industry mentors were supportive and helped us get to know the Company and also the projects. The projects assigned to me were according to our field of interest, so the motivation was high throughout the project. We got to learn many things about AR, VR, and MR technology, and we also got some insights into Unity Engine.

Learning Outcome: I learned about Machine Learning and Neural Networks and how they work, got an idea to develop ML models from images, and made ML Models.
I also got insights about how a project idea is developed, considering the group affected, the usability, the resources, etc.

PS-I station: Malhar Industries- CRM and HR Automation , Nagpur

Student

Name: ABHAY KUMAR SHREEVASTAVA . (2019AAPS0200G)

Student Write-up

Short Summary of work done: Worked on the CRM Software of the industry. Collaborated with the team and made necessary changes to the web app.

PS-I experience: The experience was good. PS faculty allotted helped me in learning process and guided me through the entire PS.

Learning Outcome: Learned Python,Django,React JS.

PS-I station: Manikgarh cement-Electrical & Electronics , Chandrapur

Student

Name: SIDHAYE ADI UTTAM . (2019A8PS0517G)

Student Write-up

Short Summary of work done: Our project in our ps station was automation system in process plants. As this was our first industry experience and we had no idea about automation in a factory we were taught everything from scratch. We learnt about the cement manufacturing process,what sensors are used to collect data and how PLC and HMI are used to make sense of the data and change the settings accordingly.

PS-I experience: My experience during PS1 was very insightful as we got first hand insight into how the industry works and how the role of an instrumentation engineer is important in taking companies towards a future of automation.

Learning Outcome: I learnt more about my core enginnering discipline as well as about corporate work culture

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Name: NANDAN MOHTA . (2019A8PS0580G)

Student Write-up

Short Summary of work done: Study about how a power plant is automated.

PS-I experience: It was a good consulting with the industrial experts and gaining a part of their vast knowledge.

Learning Outcome: How a power plant is automated.

PS-I station: Manikgarh Cement-Mechanical , Chandrapur

Student

Name: VINDESHWARI PRASAD . (2019B4A40787G)

Student Write-up

Short Summary of work done: Here, I learnt about the importance of maintenance work done in company and how to do it. Some work are done on regular basis other are done during emergency situation.

PS-I experience: It good experience, I learnt the importance of maintenance in any company

Learning Outcome: How to do maintenance work and tackle any emergency situation in compoany related to machine.

PS-I station: MTAB Engineers Pvt Ltd- Manufacturing , Tiruvallur

Student

Name: MAHIT GEOZU JAMES . (2019B2AB0921P)

Student Write-up

Short Summary of work done: Design and analysis of cycloidal gear in six axis robot.

PS-I experience: Good.

Learning Outcome: Robotics and gear design.

Name: SAKSHAM . (2019B3AB0307P)

Student Write-up

Short Summary of work done: During my PS-1 at Mtab, my group was involved in a project in which, we had to do calculations for conversion of an 6- axis Robot [that Mtab designed in partnership with IIT-Madras] from harmonic gear to cycloidal gear. For this project, firstly we had to learn about both the gears thoroughly - their structure, working, mathematical equations, dynamics etc. Our first Project report was based on these topics only- we explained both of the gears and then compared them based on 6 parameters. For this project we had to go through a bunch of articles, Research papers, clips, videos etc. Then came the designing part. For designing we used the same software used at Mtab- Autodesk Inventor. After going through various tutorials and basic designing exercises, we were given our first project, designing a Cycloidal drive with a given reduction ratio and dimensional constraints. We designed it (using parametric equations) but, when we were asked to design one with reduction ratio of 80, we hit a dead end. For 1 week we tried but failed. In the end, we moved our design from a single disc drive to a 2- disk drive and finally we were able to design the Drive that can be used for converting the robot from harmonic to cycloidal gear- Which was our final Project report.

PS-I experience: It was a mixed experience. I personally enjoyed the research and designing work but at times I desperately wished I could be on site and see how the robots were designed and how the gears actually operate rather than studying about them or watching their working simulations. The Review meetings were short and to the point which I liked but, during interactive activities like Group Discussion, Seminar etc., I missed the live experience. Plus the part I liked the most was that the internship never/ very slightly affected my Vacation time thus allowing me learn other skills and perform various tasks without any interruption.

Learning Outcome: I learnt a lot from PS-1-
Academically, I learnt about Harmonic and Cycloidal gears in detail. I learnt basic designing in Inventor which will help me in future. I learnt how to work in a group- how to divide tasks, how to help each other out etc. The Project reports, helped boost my research and writing skills. The Group Discussions, Seminars, Review meets helped improve my communication and presentation skills.

PS-I station: Nandi Group (Sujala Pipe Pvt. Ltd)-Chemical , Nandyal

Student

Name: TAUFIQ NAZIRUDDIN . (2019A1PS0622P)

Student Write-up

Short Summary of work done: All the operations performed at Nandi Pipes everyday has been studied. We learnt how each process goes hand-in-hand to give us the PVC pipes. We also explored many more efficient methods that can be employed in the processes. We also learnt how Nandi Pipes is keeping sustainability in mind and finding better and less toxic alternatives in the production processes, and also using the most efficient methods.

PS-I experience: Initially we learnt the background of the Nandi Group of Companies. Then we learnt about how Sujala Pipes started. We got an insight and a deep

understanding of every operation going on at Nandi Pipes. And then we went on to learn the working principles behind the extruder, the main machine that makes the PVC to be shaped into pipes. We also learnt about the temperature control processes in extrusion that keeps the material in working temperature, using heating and cooling system. We also did a lot of literature search and study on alternatives for lead as heat stabilizer. On the whole, it was a very educational time at Nandi Pipes.

Learning Outcome: Initially we learnt the background of the Nandi Group of Companies. Then we learnt about how Sujala Pipes started. We got an insight and a deep understanding of every operation going on at Nandi Pipes. And then we went on to learn the working principles behind the extruder, the main machine that makes the PVC to be shaped into pipes. We also learnt about the temperature control processes in extrusion that keeps the material in working temperature, using heating and cooling system. We also did a lot of literature search and study on alternatives for lead as heat stabilizer. On the whole, it was a very educational time at Nandi Pipes.

Name: AARYAN VERMA . (2019A1PS1129G)

Student Write-up

Short Summary of work done: We worked on "Industrial fabrication and operations of PVC pipes". In our project we learned about how PVC is produced from scratch. We were given the task to find various alternatives for lead as a heat stabiliser. We got to know about working of a wide range of machines used in PVC production from extruders to caterpillar haul off. This internship also helped to brush past concepts like Carnot engine, material balance.

PS-I experience: It was pretty fun working with Nandi Group, they were very professional with our internship. Our mentors imparted us a great deal of knowledge and were always free to clear our doubts. The problems given to us weekly were very interesting, overall it was a great learning experience

Learning Outcome: I learned a lot from this internship. From basics of what is PVC to what can be done to optimise PVC production, my thought process improved with this internship. I was able to learn about design and geometry of different machines and how

they work with different loads. Added to this I got to improve my knowledge on thermocouples and heaters as well.

PS-I station: National Chemical Laboratory-Chemical (Process modeling) , Pune

Student

Name: ROHINI SEN GUPTA . (2019A1PS0711P)

Student Write-up

Short Summary of work done: The project was Model Predictive Control. We were assigned research articles about physical reactors, from which we studied a fermenter system in depth. Following this, we were assigned three topics - Proportional Integral Derivative, Dynamic Matrix Control, Neural Networks. Our task was to study each sub topic in depth and make a working model by coding a controller on MATLAB. In PID, we used the PID parameters, to make an equation for disturbance, and used ode23 to solve the simultaneous differential equations. In DMC, we studied the least squares algorithm, from a textbook by Luyben. In Neural Networks, we studied Genetic Algorithm and Stochastic Gradient Descent.

PS-I experience: I had a positive experience, and gained knowledge in a domain of my interest. We contacted our industry mentor about twice a week, and he was very helpful in clearing our doubts. Since most topics we studied and worked on, in this project, were new to us, we faced some hurdles in terms of complicated mathematical concepts, and converting them into working MATLAB controller codes.

Learning Outcome: I learnt about Model Predictive Control, it's parameters and applications. I learnt in depth about Proportional Integral Derivative, Dynamic Matrix Control, Neural Networks. In DMC, I learnt about the least squares algorithm, from a textbook by Luyben. In Neural Networks, I learnt about the working of Neural Networks

models, with multiple hidden layers, Genetic Algorithm and Stochastic Gradient Descent. I also honed the skills in coding in MATLAB, using ode23 extensively.

Name: KUBER RAWAT . (2019A1PS0727P)

Student Write-up

Short Summary of work done: We mostly worked on simulation of various forms of control processes like Proportional Integral Derivative control system, Dynamic Matrix Control system and Artificial Neural Network systems. We simulated a continuous fermenter and used these control systems on it. We spent most of our time understanding and implementing the system to our model in MATLAB.

PS-I experience: We started our work by mostly reading and forming a basic understanding of what Model Predictive Control and after the first two weeks, we started by first creating the model of our system in MATLAB and then implementing the various control system to it to desired effect.

Learning Outcome: We mostly learned about the various forms of control system that are used in the industries while learning the basic implementation of popular control systems like PID and DMC while also testing out the feasibility of having a neural network as a control system. Our programming knowledge was challenged as most of our work was done in MATLAB where we had to use custom code to fit our model as well as implement the control systems.

Name: BEHHARA ANNISHH . (2019A1PS0856G)

Student Write-up

Short Summary of work done: We got a project on the topic "Vapor-Liquid Equilibrium by Molecular Descriptors", in which the objective was to make a generalized model to predict the vapor-phase composition when the liquid-phase composition is given, for any binary mixture. This information is crucial for various separation processes (like, distillation) and obtaining this data experimentally is expensive and time consuming, which is why we made a predicting model for it.
In the first week we went through some concepts like VLE of Non-ideal solutions, Lewis-Randall rule, Activity Coefficients, Molecular Descriptors and Local Composition models for activity coefficient (We used Non-Random Two Liquid (NRTL) model among the Local Composition models). We obtained SMILES files for various molecules (that are components in the binary mixtures chosen for training) from online databases and generated their molecular descriptors data using pa-DEL software. Then we started building Machine Learning models on Jupyter Notebook to obtain correlation between NRTL parameters and the molecular descriptor data of the binary systems. R-squared value was taken as a metric to check the accuracy of the prediction. Initially we obtained negative R-squared values but eventually after a series of modifications and iterations we obtained decent R-squared values that are greater than 0.8.
Throughout the period of PS-1 along with the project work we also had a series of guest lectures from industry experts. We got an opportunity to interact with the senior scientists at the National Chemical Laboratory (Pune) and obtained a lot of knowledge under their guidance in the project. We got to improve on our soft skills during the group discussion sessions we had.

PS-I experience: Overall, this project gave us a preliminary experience of research work. We gained a lot of knowledge from the scientists at the National Chemical Laboratory and working under them helped us understand what it is like to work in the industry. Initially, the project seemed difficult due to the large amount of information we had to take-in, but eventually we turned the work into a habit and it got ingrained into our daily routine during the PS-1 period.

Learning Outcome: We gained a deeper understanding of the Vapor-Liquid Equilibrium concepts, which were taught on a basic level in our coursework. We learnt how to use online databases, softwares like paDEL and Jupyter Notebook. We also gained experience in building Machine Learning models and understood the challenges that could be faced while working on them. We gained some experience in coding in Python. We obtained a lot of knowledge from the scientists at the National Chemical Laboratory while interacting with them for the project and learnt new aspects of working out problems, that are different from what we learn at schools and colleges. This project gave us a preliminary experience of research work and helped us improve on our soft skills during the group discussion sessions held periodically. We gained some experience in writing technical reports of the work that we did weekly and maintaining records of our progress.

Every student who has undergone PS-1 comes out as a more capable person than he/she was before it.

Name: R B DANUSH SAI . (2019A1PS0876G)

Student Write-up

Short Summary of work done: "Vapor-Liquid Equilibrium by Molecular Descriptors"
The goal of our project was to calculate the vapor phase composition of binary compound system when the temperature and liquid phase composition was known.
Assumptions: We worked on binary compound system and assumed the vapor phase to behave ideally (at low pressure) and the liquid phase to behave non-ideally (so the aim was to calculate activity coefficient). There are several models based on local composition (like Wilson, NRTL, UNIFAC, UNIQUAC) but, we choose to work on NRTL model.
Molecular descriptors represent the physical and chemical properties of the molecule with numerical values (generated using ChEMBL and paDEL software). Using this we made a generalised model to predict NRTL binary interaction parameters in python using machine learning techniques (like multiple linear regression, logistic regression and artificial neural network etc), where molecular descriptors were independent variables and the binary interaction parameter was the dependent variable. With help of these parameters, we were able to calculate the activity coefficient using NRTL model equations. Now we could calculate the vapor phase composition by equating the fugacity of the liquid and vapor phase.

PS-I experience: Due to COVID-19 pandemic the PS-1 was work from home so we were not able to get actual laboratory experience by visiting NCL, nevertheless, we gained a lot of knowledge and experience. I would like to thank my mentor Dr. Imran Rahman (NCL) who guided us right from beginning and till the end. Me and my partner were in constant touch with our mentor via phone calls and sometimes google meet to update our work and to get ideas to continue our work. It was my first internship so I gained a lot of experience and got to know how to carry out research.
If anyone wants to know more about my experience and NCL you can contact me via my BITS mail ID.

Learning Outcome: PS-1 was my first internship and first experience to work with outside world. I learnt a lot of new concepts and experience and how to carry out research

efficiently. I learned a new concept of molecular descriptors. Our project involved machine learning using python so I leaned python and ML techniques like multiple linear regression, logistic regression, artificial neural network, genetic algorithm etc. I also learned the process of how to find and read research papers.

Name: GONUGUNTLA VENKATA SAI DINESH . (2019A1PS1034H)

Student Write-up

Short Summary of work done: The project assigned to me was simulation of an adsorption model using an aspen plus software.
I had gone through couple of research papers and replicated the results in those in aspen plus software.

PS-I experience: Overall it was a good experience

Learning Outcome: I learnt about basics of aspen plus software which might be useful to me in the future . And I had gone through couple of research papers through which I gained a lot of knowledge about industrial adsorption.

Name: AVDHESH VERMANI . (2019A1PS1060G)

Student Write-up

Short Summary of work done: The topic of my project was "Reactive Distillation". As part of the project, I was assigned a partner and both of us did extensive literature review on the topic and chose a binary non-ideal system. The system would be the basis of the code which we had to write. Then, we performed a vapour-liquid equilibrium (VLE) analysis for this system. VLE plays a very important role in distillation. To perform this analysis the UNIFAC model for calculation of activity coefficients was chosen. Next we

wrote the code to perform reactive distillation on the chosen system. For all the simulations, the code was written in MATLAB.

PS-I experience: We had to work in teams of two which made it very easy to work and solve any doubts. But, it being an online and remote PS it was not possible to gain industrial experience of working at NCL. However, our mentor used to take regular updates which motivated us to work. Overall, my experience was very enriching as I learnt many new skills both academic as well as interpersonal.

Learning Outcome: This project enhanced my knowledge on distillation as well as reactive distillation. I also got to learn many correlative methods in non-ideal VLE which was quite interesting. This project improved my MATLAB skills and made me proficient in it.

Name: DEVANSH DROLIA . (2019A1PS1066G)

Student Write-up

Short Summary of work done: The project that was alloted to me was- Azeotropic Distillation. The main aim of the project was to learn and execute process modelling and simulation. We modelled the Vapour Liquid Equilibrium for non ideal ternary systems using the interactive MATLAB - Excel code that was made by my teammate. Atlast ,we simulated the Extractive Distillation and Pressure Swing Distillation column in DWSIM software.

PS-I experience: The overall PS1 experience was good. Our PS1 faculty and industry mentor were quite supportive. This project was based on intensive process modelling and simulation. Since I was not that familiar with MATLAB and DWSIM, I had difficulties while using them to simulate the VLE and the ED and PSD column. My team partner was very supportive. He was very well versed with programming and he helped me a lot during the project. I would strongly recommend upcoming batches students to learn MATLAB programming if one wishes to do his Practice school 1 at NCL, Pune. Overall the experience was ok.

Learning Outcome: I learnt a lot about my project. We learnt about Azeotropes, different types of Azeotropes, various methods to separate them, their applications and the recent advances in Azeotropic distillation technologies. During this course, I became familiar with MATLAB, DWSIM softwares. I also learnt about Extractive Distillation and Vapour Liquid Equilibrium.

Name: MADHAV JINDAL . (2019A1PS1132G)

Student Write-up

Short Summary of work done: Project work's main theme was to model and simulate the methods of azeotropic separation. Theory behind the azeotropes and its types have been discussed in the first section. A case example of Acetone-Methanol was taken to separate as they are of high industrial importance. VLE modelling using MATLAB was done which also incorporated the NRTL model. The MATLAB code was integrated with Excel to make it user friendly.
After thorough literature search, we shortlisted two methods to separate, Extractive Distillation and Pressure Swing Distillation.
For both of these processes we created flowsheets and modelled them. The working of the processes has been explained at length in the report.
Our analysis of both these simulations, suggested that Pressure Swing Distillation provided higher amount of separation as compared to Extractive Distillation.

PS-I experience: My PS-1 experience at NCL-1 was good one given the circumstances. While it was executed in a proper manner, though it would have been much better in the offline version. The project was a difficult one to follow as it required to bridge the learning gap.

Learning Outcome: • We learnt and executed process modelling and simulation of the various methods to separate azeotropes..
• Learnt about various types of azeotropes, methods of separation and the recent advances in azeotropic separation technology
•Learnt about Vapor-Liquid Equilibrium, activity coefficients, and different models like NRTL.
• We modeled VLE for binary and ternary non-ideal systems using MATLAB and the NRTL model.
• We also simulated Pressure Swing Distillation and Extractive Distillation

process using DWSIM and compared the results.

Name: S DANUSH . (2019A1PS1460H)

Student Write-up

Short Summary of work done: The project I was given was "Simulation of Continuous Flow Adsorption Columns". I had to read various research papers about the working and industial application of Adsorption Columns, and perform simulations of the models in the research papers in Aspen Adsorption software.

PS-I experience: It was a good opportunity to learn to do literature review, work on new softwares, along with the application with good guidance. But the online mode wasn't helpful in being able to get a good understanding of the work environment.

Learning Outcome: Aspen Adsorption Software, Applications of Adsorption Columns

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PS-I station: National Chemical Laboratory-Computer science , Pune

Student

Name: GAYATRI KEDAR PATANKAR . (2019A7PS1006G)

Student Write-up

Short Summary of work done: The work involved the creation of an interface for a flow chemistry database to be used for artificial intelligence applications in designing pathways for manufacturing important chemicals. Along with this, a review paper on the topic of "Flow Chemistry and Artificial Intelligence" was written in collaboration with group mates.

PS-I experience: I had a good PS-I experience, my mentor was very supportive and provided valuable guidance.

Learning Outcome: Learning outcomes included deeper understanding of databases through the software mysql, various python libraries for creating a graphical user interface. As it was an interdisciplinary project, I gained the ability to work efficiently in a team with people with a different skill set.

PS-I station: National Highways - Govt. of Telangana , Hyderabad

Student

Name: ASEEM JAIN . (2019A2PS0747P)

Student Write-up

Short Summary of work done: The work given by mentors were related to the industry and the in depth knowledge taught was also very educative.

PS-I experience: The experience was wonderful, learned a lot of new things related to the industry.

Learning Outcome: I learned many skills such as researching and analyzing different research papers and built confidence in my speaking skills.

Name: RAMKRISHNA SHARMA . (2019A2PS0929P)

Student Write-up

Short Summary of work done: We were allotted a project related to the Bituminous mix design related to bitumen mix, used to build the binder course of the pavement over which traffic movement takes place.
We came to know the properties of materials used in construction and the methods used to find the proper proportioning of these materials for the best possible mix design for ensuring better durability and ride quality.
Under the guidance of our mentors, we came to learn a lot of new things related to our project and also, the practical relevance of this project.

PS-I experience: The starting orientation was very good and we came to know the process how the highway projects are planned and how it commences forward.
Under the guidance of our faculty in charge and our assigned industry mentors, we learnt a lot.

Learning Outcome: During this time, I came across many IS, IRC, and MORTH codes and I also came to know the implications of all the tests and standards mentioned in these codes and how they help in a better quality of roads to be built. The presentation and group discussion also helped to improve my presentation and communication skills. Report writing and case studies which me and my team had to prepare, also give us some good insight in our project matter.

Name: DEEPTI SHEORAN . (2019B2A21541H)

Student Write-up

Short Summary of work done: Overall it was a practical learning experience of the industry. We got a reality check on how to apply the knowledge from the books to the field.
We learned about the Tender processing, acquiring the ROW and then dealing with contractors, involving third party and the effect of budget on the completion of the project.

We learned about preparation of detailed project report and the multiple stages of highway construction. We learned about the methodology of various stages during Highway construction.
Overall it was a great learning experience.

PS-I experience: The online PS experience was good. It was a nice experience, Industry mentor was always connected with us, the deadlines were set right and we could finish our assigned tasks on time. Every communication was smooth and I didn't face any issues due to online mode of interaction. The time period of the project could have been more is my suggestion. I, personally, wanted it to be more practical as it was my first industrial experience but due to the covid situation, it wasn't possible. I learned a little about the industry working and got some experience of working and reporting to the seniors

Learning Outcome: Major learning was my presentation skills- speaking and expressing my views clearly to the instructors. Some technical skills like analyzing data. And an immense amount of knowledge about the industry proceedings.

PS-I station: NCCBM-Chemical , Ballabgarh

Student

Name: ADITYA RANJAN . (2019A1PS1133G)

Student Write-up

Short Summary of work done: My project was modelling of a caliner. The calciner is the site of calcination of where limestone is broken down into quicklime and CO2. My model was based on machine learning which used various regression algorithms to calculate the outlet temperature of calciner taking kiln speed, amperage,pre heater temperature and various other parameters extract and cleaned from daily log sheet of a cement plant. The model is able to predict the temperature with high degree of accuracy when validated against test data sheet.

PS-I experience: The PS station at NCCBM is a R&D institution which means you'll might be able to get option amongst the various project topics. The station guides are skilled in their fields and they were able will be guide us throughout project even in online mode . All in all it's was good learning experience with work being done at a comfortable pace to it's completion.

Learning Outcome: I was able to acquire skills like

- Exploratory Data analysis
- Tensor flow
- Python libraries like numpy, pandas, seaborn,pyplotlib

Name: NAMAN NANDWANA . (2019B5A10832P)

Student Write-up

Short Summary of work done: I designed a dryer of capacity 20 tones per hour that uses solar thermal energy as a source of heat transfer.

PS-I experience: My PS 1 Experience was great, the mentors from both Industries and Institutes, really helped us a lot, with GAP lectures. The lack of availability of basic research data, proved to be a challenge, especially with the virtual mode of Internship. Barring that, the entire PS 1 experience was great and helped learn a variety of new skills and areas in the power sector.

Learning Outcome: I learned to implement theoretical knowledge into real world solutions, A multidisciplinary problem helped me understand the need to have a basic grasp of all concepts.

PS-I station: NCCBM-EEE/E&I/E&C , Ballabgarh

Student

Name: Aravind Prakash Venkatakrishna (2019A8PS1025G)

Student Write-up

Short Summary of work done: I was assigned the work to design a control system for a cement plant and to design a cable schedule.

PS-I experience: The work was pretty decent the mentors helped in giving the materials to help in the progress of the design.

Learning Outcome: I understood how important the electronic industry is to the world and I learnt that without the electronic industry the world would collapse.

PS-I station: NCCBM-Mechanical , Ballabgarh

Student

Name: LONIKAR RAGHAV PRAMOD . (2019A4PS0532P)

Student Write-up

Short Summary of work done: Studied research papers and gathered data from various sources regarding Enthaply Wheels (my project focus), Learned Hourly Analysis Program and How it is used in Building services and management industry to calculate Cooling Loads for sizing HVAC systems. I calculated various inputs needed in simulating the Floor plan given in the problem statement. I then used said simulation to calculate air system sizing information for that perticular floor plan. Prepared a project report on how Enthalpy wheels can be used in given problem statement to decrease cooling loads and equipment costs. calculated the reduced cooling loads. Recommended ideal product for said HVAC system according to design specifications and models available for calculation.

PS-I experience: It was good for online PS1 experience. My Mentor was very helpful, and gave me my choice of project topics. It mostly involved self learning with timely interventions from my mentor to keep me on track in the project.

Learning Outcome: Learned Basics of Various types of HVAC Systems and cooling load calculations. Learned HAP software and how it is used to select HVAC Equipment in Building Services and Management industry. Learned about Waste Heat Recovery systems in HVAC. Learned presentation and soft skills required in corporate organizations.

Name: NIKHIL BAFNA . (2019ABPS0665P)

Student Write-up

Short Summary of work done: Did a study on the Feasibility of Biomass in the Indian Cement Industry.

PS-I experience: The mentors were interactive and open to new ideas so we were able to have a healthy discussion and move in the right direction for a suitable project. However , the mentors were working professionals and hence were really busy sometimes. I was expecting to learn and interact much more.

Learning Outcome: Report Making , Cement Industry Exposure , Soft Skills

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PS-I station: NTPC-Mechanical , Dadri

Student

Name: ANU DANDOTIYA . (2019A4PS0461P)

Student Write-up

Short Summary of work done: Analysis of efficiency of supercritical cycles. Extensive research on the material to be used. Study of testing procedures was done.

PS-I experience: It was good experience. We learned practical knowledge about how the industry works, how the energy gets produced on that large scale.

Learning Outcome: Learned about supercritical cycles. Inconel alloy materials study was done, their advantages were discussed. Test loop with the material , hydraulic testing procedures were researched.

PS-I station: Plastic water lab-Electronics , Bangalore

Student

Name: SHIVANK MAHESHWARI . (2019A4PS1036G)

Student Write-up

Short Summary of work done: We had to create a deep learning CNN model to identify defects and other parameters of an object while keeping it in front of a live camera. this involved creation of machine learning models, feeding them with dataset and then integrating those models with live camera and on screen result display.

PS-I experience: it was a very good experience. you have to find your way of how to go about the project. the mentors would just guide you and give you a direction, so that was great. overall a very good experience

Learning Outcome: i learnt report writing, work ethics, deep learning and got insights into opencv and various other python libraries.

Name: JISHNU R WARRIER . (2019AAPS0296G)

Student Write-up

Short Summary of work done: • Learnt the importance of programming to solve industry-wide problems
• Studied the various algorithms used today for machine learning and object detection
• Built custom machine learning models
• Learnt video and image manipulation using OpenCV
• Learnt reading documentation of extensive libraries and using models from open-source repositories
• Learnt web interface integration of models coded in Python
• Learnt product life-cycle development and project management
• Learnt the nuances of making a product saleable
• Learnt soft skills in presenting product
• Learnt the nuances of technical report writing

PS-I experience: The experience of Practice School-I proved to be an excellent introduction to the corporate world, and gave me the hands-on opportunity to learn about machine learning.

Learning Outcome: Learnt practical application of machine learning concepts, how to work effectively in a team, how to present findings in the most constructive manner. It gave me a nice exposure to the corporate work life in a technical context.

Name: JAVIN BACHANI . (2019B1A81068G)

Student Write-up

Short Summary of work done: Create a Machine Learning Model capable of detecting defects in Manufacturing items like bottles using convolutional neural networks(CNN's). This was achieved by making a deep-learning model integrated with three different CNN's for each different problem classification. This integrated model was able to output a video stream which shows detects objects like bottles on users camera and identifies its material, color, shape, size & whether it has any defects like dents, missing caps, crushed, broken, cut etc..

PS-I experience: I had a good experience working at my PS station. I got the opportunity to learn a lot about how an organization works, gained a lot of knowledge through the guidance of such highly qualified mentors and the project provided me to explore a completely new domain based on machine learning which I could not have done otherwise.

Learning Outcome: Learnt the importance of programming to solve industry-wide problems. Learnt how to code in different domains of Machine Learning like Transfer Learning & CNN's. Learnt data augmentation techniques. Learnt video and image manipulation using OpenCV. Learnt web interface integration of models coded in Python. Learnt product life-cycle development and project management. Learnt soft skills in presenting product.

Name: JAVIN BACHANI . (2019B1A81068G)

Student Write-up

Short Summary of work done: To build and train a machine learning model(s) to accept the input of an image or a live video feed and detect the presence of a bottle and any defects within it. Additional information about the presence of cap, logo and material and color identification was also required to be identified. A transfer learning model was fine tuned and coupled with 2 CNN models made from scratch for each binary problem classification.

PS-I experience: It was a good experience. Learned how to make machine learning models for real world problems and my presentation skills improved a lot. Learned how to collaborate & research in a group.

Learning Outcome: Learnt the importance of programming to solve industry-wide problems. Studied the various algorithms used today for machine learning and object detection. Learnt video and image manipulation using OpenCV. Learnt web interface integration of models coded in Python. Learnt product life-cycle development and project management. Learnt soft skills in presenting product.

Name: ANANY PORWAL . (2019B2A40894P)

Student Write-up

Short Summary of work done: we build an application which had AR drawing over a video call

PS-I experience: Excellent had good exposure

Learning Outcome: learned unity , AR foundation and Agora

Name: ABHIGYAN BAJPAI . (2019B4A80254G)

Student Write-up

Short Summary of work done: The project deals with the application of computer vision to combat the practical problem of crowd analysis. Many sub-tasks were identified like the detection of multiple persons in an environment. The project utilises the pretrained YOLOv4 model. The pretrained features have been developed by training on the MS

COCO dataset, which has over 80 object classes. The problem of localization and classification in a single stage is a feature of the used model, giving it its name “You Only Look Once”. Transfer learning was implemented in the final model to use the lower level features which are hard to train and essential for the further development. Many data preparation techniques were utilized to increase the performance of the model. The final model is capable of running on runtime data. The model successfully performed the detection and counting of persons in the frame with 81% accuracy on image data and with 83% accuracy on video data. Utilizing the free GPU service and the CPU computation, the final results are respectable with respect to the given constraints. The model has been deployed in the form of a web application using CPU servers for free. This ensures that the end user, client has no computation load on their respective device. Deployment on the servers also facilitates updating the model in the future and the building of automated machine learning and development operation (MLOps) pipelines. With increasing user base and requirement for the implementation of advanced techniques like queue detection and facial recognition, the cost of utilising the GPU servers would be justifiable.

PS-I experience: It was good a good learning experience. I got a chance to solve the practical problems.

Learning Outcome: Learning outcomes:Team skills, Organisation skills, Communication skills, Group discussion, Seminar presentation, Report writing, Documentation, Extensive literature survey, Machine learning, Deep learning for computer vision, Transfer learning, Image data processing, Python, Numpy, Pandas, Matplotlib, Seaborn, Scikit-learn, PyTorch, Fast.ai, TensorFlow, Keras, OpenCV.

Name: DHRUVA RAJA . (2019B4AA0693G)

Student Write-up

Short Summary of work done: The project involved the creation of an Augmented Reality(AR) remote assistance application for technicians. Through this application, a junior technician in the field can video call a senior technician not present in that location for guidance. The users can then use the application to mark objects in the environment of the junior technician, allowing the senior technician to use visual indicators to assist the junior technician. The application was made on the Unity game engine. The AR Foundation framework was used for augmented reality development and the Agora video

Software Development Kit(SDK) was used to implement the video calling and remote marking functionalities.

PS-I experience: The experience was good. I was able to learn Augmented Reality(AR) development from scratch and was able to build a full application by the end of the internship.

Learning Outcome: Learned to use Unity, C#, AR Foundation, Agora

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Name: SAMIKHYA NAYAK . (2019B5A40845P)

Student Write-up

Short Summary of work done: Our team is required to design and develop a 'moisture-sensing waterer' for Plastic Water Labs. The purpose of the kit is to water plants by sensing moisture in the soil. Thus the moisture data should be monitored and recorded in real time. Depending on the moisture of the soil, the water flow to the plants needs to be controlled. The kit should have remote monitoring capability.

PS-I experience: Our PS tenure was loosely divided into 2 phase- 1. Research, plan and proposal 2. Implementation of our proposal
The first stage involves the conceptual, detailed and commercial design- We identified key objectives of this project and roughly decided on the feature of the kit. Gained understanding of the process overview. Researched about all the technology and devices that could be used to accomplish our objectives. Decided upon the specification of hardware and software used. Techno commercial analysis- Narrowed down vendors for procurement of material, Did an cost analysis and Researched on already existing similar product in our market and what can we bring.
For the second phase – implementation We coded the ESP32. That involved learning to code in Arduino IDE. Then divided the code into 8 parts and each member did 2 parts.
We assembled the prototype, connecting all the devices, configuring blynk. The third phase involved trying and test the product under different configurations

Learning Outcome: IoT, Arduino

PS-I station: Plastic water lab-Mechanical , Bangalore

Student

Name: ADITYA NAIR . (2019A4PS0147P)

Student Write-up

Short Summary of work done: The work done by the team was on a project where we were required to design and assemble a moisture sensing waterer using IoT(Internet of Things) . The kit had to be able to water the plants autonomously and also send data to the user regarding soil moisture , temperature , humidity . The conceptual design was drawn up first with the team researching about the numerous ways we could achieve this using IoT and while also learning about IoT . Then we submitted the detailed and commercial design along the timeline to the company. Finally , the company procured the parts and the team assembled the waterer kit and held a live demonstration at the BITS Pilani , Hyderabad Campus.

PS-I experience: It has been a informative experience with me learning about a sector i.e Internet of Things , that I had no prior knowledge about . I was definitely interested in the topic after learning about its capabilities and the opportunities it holds for the future when implemented properly. The whole experience has been knowledgeable regarding the proceedings in a company and interpersonal communication.

Learning Outcome: The whole experience taught me about the way we converse within a company and the right phrases to use while replying to emails etc. Getting to work on a technical project really gave me more ideas of things I could build or innovate upon. My project mentor at Plastic Water Labs taught us how to ask the right questions and therefore, reach the answers I needed .

Name: PRABHAV KAULA (2019A4PS0573P)

Student Write-up

Short Summary of work done: The project uses the application of computer vision to combat the practical problem of crowd analysis. Many sub-tasks were identified like the detection of multiple persons in an environment. The project utilises the pretrained YOLOv4 model. The pretrained features have been developed by training on the MS COCO dataset, which has over 80 object classes. The problem of localisation and classification in a single stage is a feature of the used model, giving it its name “You Only Look Once”. Transfer learning was implemented in the final model to use the lower level features which are hard to train and essential for the further development. Many data preparation techniques were utilised to increase the performance of the model. The final model is capable of running on runtime data. The model successfully performed the detection and counting of persons in the frame with 81% accuracy on image data and with 83% accuracy on video data. Free cloud GPU and CPU gave respectable results with respect to the given constraints. The model will be deployed using a web application with CPU servers for free. This ensures that the end user, client has no computation load on their respective device. Deployment on the servers also facilitates updating the model in the future and the building of automated machine learning and development operation (MLOps) pipelines. With increasing user base and requirement for the implementation of advanced techniques like queue detection and facial recognition, the cost of utilising the GPU servers would be justifiable.

PS-I experience: PS-1 was an enriching experience, as it supported the application of the theoretical concepts of artificial intelligence. A model was developed which performed well even with runtime data. The task was challenging because of its complexity and the constraints of computational resources available to conduct the necessary experiments essential for the development of the model. Team-work helped in literature survey, research, organisation approach and works, and ultimately obtaining the results. Communication skills were important at every stage especially when the team members had to be approached using the online medium. Weekly meetings with the organisation helped in evaluating the progress and redefining the approach when needed. Evaluative components like seminar and group discussion added to the experience offered in the PS-1. The 8 weeks of PS-1 resulted in a holistic development where the application of advanced concepts coupled with the use and development of soft skills.

Learning Outcome: Team skills, Organisation skills, Communication skills, Group discussion, Seminar presentation, Report writing, Documentation, Extensive literature survey, Time and resource management, Machine learning, Deep learning for computer

vision, Transfer learning, Image data processing, Python, Numpy, Pandas, Matplotlib, Seaborn, Scikit-learn, PyTorch, Fast.ai, TensorFlow, Keras, OpenCV.

Name: SIDDHANT SHROTRIYA . (2019A4PS0791H)

Student Write-up

Short Summary of work done: Our project was to make an AR remote assistance application. In the first few weeks, the fundamentals of Extended reality were learnt which included basic working and uses of Augmented Reality (AR) in today's modern world. Gaining knowledge on the working of Unity software and implementation of some basic tutorials were done by all the members of the team followed by the integration of the ARFoundation SDK and Agora SDK into Unity, which is a software that enables the creation of AR applications.

PS-I experience: It was a very enlightening experience for someone like me, who didn't know anything about Unity or AR. It was a really good learning experience with a really good team as well.

Learning Outcome: Learned Unity platform for Extended Reality (XR) using ARFoundation SFK and Agora SDK

PS-I station: Plastic Water Labs - Actuators and Sensors in IoT , Bangalore

Student

Name: NARA GURU NARAYANASWAMY . (2019A3PS0429H)

Student Write-up

Short Summary of work done: We made an AR Remote Application which enables two users to perform a Real-time communication (RTC), it helps junior technician to communicate using mobile device which uses camera to track and map the real world. After this junior technician and senior technician will be able to draw the AR world.

PS-I experience: We were given a good project and Plastic water labs guided us to complete the project within 2 months.

Learning Outcome: Learn't Unity and how to interface it with SDK like AR Foundation and Agora

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Name: CHITRAPU SAI SUDARSAN . (2019A3PS0461H)

Student Write-up

Short Summary of work done: This project is an start to end project that involves product research, product development, prototyping IoT system, market research, and other business and commercial aspects involved in building a commercially viable IoT system. My teams goal is to develop an IoT based automated irrigation system which senses the moisture content in the agricultural soil and waters the land accordingly. Amount of water used versus various factors like temperature, humidity, month, time etc. have to be analyzed to understand the water usage. ESP32 microcontrollers have been used in this project both for sensor nodes and as a gateway. Worked with ESP-NOW, a 802.11 based protocol for intra system communication and GSM module for connecting the physical plant to the internet.

PS-I experience: Despite an online PS, it has been a great experience to work with a team from different campus and branches. Got great insights into the working of an organization. Understood the processes behind product development and design. With supporting team and mentors, the overall experience is excellent.

Learning Outcome: Learnt about ESP32 microcontroller, Programming ESP, RTOS, communication protocols, interfacing various sensors and DC motors. Learnt the structured and documented approach to developing or building a commercial technological product.

Name: MADKAR ADITYA RAJENDRA . (2019A4PS0170G)

Student Write-up

Short Summary of work done: Our team worked on an Iot based automated irrigation system kit. It was a research based and innovative project and first time it was done for anyone in Bits internship program. The project was based on making and designing a moisture sensing waterer that is capable of remote monitoring and controlling the water flow to plants. The initial stages of the project included researching and finding out the concepts behind making this idea a reality. Research was done on various parts of IoT and how it can be used to solve the problem. We also had to do comparative study to see why and which equipments to use and which not to use.

PS-I experience: We were not previously exposed to Iot subject by any way so it was overwhelming at first. But we completely manage to stick by the timeline and give satisfactory work and presentation to our company. Faculty and mentors were helpfull and guided us very professionally. We were able to assemble the whole kit and code it even tho all team members were spread across country which was little tiring. My team was very interactive and we had amazing coordination. It was a great experience overall..

Learning Outcome: I learnt a lot about Iot based project and future industry 4.0. I learnt how to and why it's the future of this generation. I got so much better at presenting whatever I have to present and also at group discussions. I learnt the right method to research for any topic to start for any project. I learnt to work in team effectively.

Name: ISHAN NEOGI . (2019A4PS0393G)

Student Write-up

Short Summary of work done: This project aims to use Convolutional Neural Networks (CNNs) to build and train a defect detection model for use in the Bottle industry. This model is capable of detecting and segmenting a bottle out of the frame of an ordinary camera (with similar specifications to a common phone camera today) and detecting various features of the bottle, specifically, its aspect ratio (height to width ratio), color and material the bottle is made out of, and identifying bottles that may be defective. For the purposes of this POC, the defect is limited to crushed and broken bottles. This projects involves building and training ML Models, image and video manipulation and web interface creation.

PS-I experience: As a student who had no experience in coding, this new experience was very beneficial. the freedom to work and showcase our own ideas in the projects was very encouraging and helped me explore new things that I would never have done myself otherwise. This experience allowed me to learn a new branch of study besides my college degree education and the freedom allowed for a fruitful learning experience.

Learning Outcome: Was introduced to Python Programming to solve real-life problems; learned about machine learning, artificial intelligence and neural networks; Learned video and image manipulation using OpenCV; Learned the reading of documentation for coding problems

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PS-I station: Preto Tooling Systems-Mechanical , Hyderabad

Student

Name: ARNAV JAIN . (2019A4PS0338P)

Student Write-up

Short Summary of work done: We were required to gain knowledge about the keywords associated to press tool operations and sheet metal defects. We had to later present our

learning through a presentation and report. We were also given topics like 3D modelling and scanning for group discussion. Our final assignment was to design a blanking tool for a given die.

PS-I experience: It was overall a great experience. Both our instructor and and mentor helped us through our project and provided their advice that will later help us in our future. They were always available for any kind of doubts regarding the project.

Learning Outcome: I gained knowledge about the manufacturing processes, press tool operations, sheet metal defects. The project also helped in improving my interpersonal, communication and presentation skills.

Name: PRIYANK PIYUSH . (2019A4PS0483P)

Student Write-up

Short Summary of work done: Study and Design of press tools. Learnt about various components in a press, their material and how to design them

PS-I experience: Good. Got to learn a lot of new thing

Learning Outcome: Learnt how an industry works, the various processes involved. Importance of teamwork in industry

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Name: AKSHIT SINGH KATHAIT . (2019B5A40746P)

Student Write-up

Short Summary of work done: Understanding sheet metal manufacturing and designing a tool to achieve the given design .

PS-I experience: It was a great experience . We ; under the guidance of industry expert ; research a lot regarding sheet metal manufacturing . Designing the tool form scratch was a challenge ; but rewarding nonetheless .

Learning Outcome:
1) Sound knowledge of sheet metal and tool designing.
2) Better communication skill.
3) Learn how to work in a team.

PS-I station: Rajshree Cement-Civil , Malkhed

Student

Name: MOHIT BANSAL . (2018B3A20164P)

Student Write-up

Short Summary of work done: My first project was to study research papers and do research on sustainable curing of water,for which I found various new effecient methods to cure water. The second project was UHPC. A new category of concrete with very high fibre content has high potential. The third project is natural pozzolans and industrial wastes.

PS-I experience: It is a great learning experience . First time I studied research papers and also got to know about my station Birla cement.

Learning Outcome: I got to learn different things about construction materials .

Name: VIRENDRA YADAV . (2019A2PS0640P)

Student Write-up

Short Summary of work done: We had to find substitute for sand used for concrete so we reviewed different articles we found online and summarize and made our report. I also summarized different articles on self compacting concrete and collected various information and data about it.

PS-I experience: It was very good experience because for 1st time we got to industrial point of view on using different substitution not only theoretically.

Learning Outcome: I got to learn to use industrial waste and other resources can be used to make concrete.

Name: ISHIT GARG . (2019A2PS0798P)

Student Write-up

Short Summary of work done: We researched on sustainable construction. Alternatives of natural resources in industrial wastes were assigned to maintain an eco-friendly balance.

PS-I experience: It was good

Learning Outcome: We understood the work procedures in the corporate sectors

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PS-I station: Rawan Cement Works-Civil , Raipur

Student

Name: MANIK MEHTA . (2019B1A20612P)

Student Write-up

Short Summary of work done: My project was "Design of MCC Room with Footing and estimate of Quantity". I was allotted two mentors who helped me in the project work. Firstly, we were given overview of the plant which is situated in Raipur. Then gradually with the help of mentor we completed the design work and the calculations required to complete the project. In between some evaluations were conducted and by mid July, PS1 ended.

PS-I experience: Overall, the experience was good and staff at the industry was quite helpful.

Learning Outcome: I got to know about how to manage a civil industry project and what kind of work is done there and scope of this field.

PS-I station: Rawan Cement Works-Electrical & Electronics , Raipur

Student

Name: MANNEPALLI VYSHNAVI SWETHA (2019AAPS0284G)

Student Write-up

Short Summary of work done: Due to covid, it became a Study project. So we learned about field instruments and gas analyzer, PLC Unit, DCS System, Architecture overview of cement industry.

PS-I experience: Good. It is a new topic for me,so it is very interesting.

Learning Outcome: Learnt about manufacturing industry and many new things that we don't know before.

PS-I station: Shalaka Connected Devices-Mechanical/Manufacturing , Pune

Student

Name: BODDU HARSHA . (2019A4PS0428P)

Student Write-up

Short Summary of work done: The Project was based on developing a Desktop-based Display System for Inertial Measurement Unit (Measures Acceleration and Tilt in 3-axis) for the stability of mobile systems, which is related to Industrial IoT and Automation (sensor and Machine Process) In our project, we worked on code that will collect data from an IMU sensor and display it back to the user in a well-organized manner for which we have developed a graphical user interface (GUI) with python programming which simplifies configuring the internal registers in the IMU module and also the system will regularly sync with the cloud application and monitor all alerts (such as obstacle presence) from the sensor. This helps in controlling gantry structures in real-time. The input obtained from the IMU shall take the data from parts of the gantry and use it for controlling its operation.

PS-I experience: We as a team of 5 worked on project of developing a Desktop-based Display System for Inertial Measurement Unit for the stability of mobile systems and PS1 helped to enhance soft skills like working in team and also our mentor and instructor are really good at supporting us, this helped to have good progress throughout our PS1.We have learned technical skills like coding in Python programming and Python libraries like tkinter for designing Graphical user interface(GUI).

Learning Outcome: I found PS-1 as great opportunity to explore the field of Industrial IoT and Automation and Industry 4.0,I have learnt about implementation of IoT in the virtual factory, which is very essential particularly in the situations like COVID Pandemic and also for future generations. the overall PS1 helped in developing soft skills along with technical skills of Python programming. On overall it helped to nurture work balance and grow professionally too.

Name: BATCHU AKASH . (2019A4PS0478P)

Student Write-up

Short Summary of work done: An IMU sensor is an electronic device that measures the acceleration, rotation, and orientation of a robot or gantry. The IMU will provide data on 9 different parameters: acceleration along 3 axes (data from the accelerometer), inclination about 3 axes (data from inclinometer), and magnetic field along 3 axes (data from magnetometer). By combining acceleration, inclination, and magnetometer data from the IMU, we can estimate the exact position and speed of the robot. For testing the edge computer application, a module will be developed to simulate the IMU sensor.
Our application will store the processed data in a CSV text file which is easy to download. The same data will also be displayed on the main page of the web application, where the user can access it anytime. We will also develop a local GUI that displays sensor data, plots graphs, and setting internal registers of the IMU module.
The system will regularly sync with the cloud application and monitor all alerts (such as obstacle presence) from the sensor. This helps in controlling gantry structures in real-time. The input obtained from the IMU shall take the data from parts of the gantry and use it for controlling its operation.

PS-I experience: It was a good learning experience, even though it was online, the PS mentor made sure to teach the required skills well and then use them for the rest of th Internship Program

Learning Outcome: Working as a team, Managing time and optimising schedules if everyone in the team for best results, technical skills such as Python and knowledge on embedded systems

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Name: LAVITRA KUMAR GARG . (2019A4PS0482P)

Student Write-up

Short Summary of work done: My project was based on developing a desktop data display system to show the data collected from an IMU sensor. In the scope of 8 weeks, I went through the sensor datasheets to understand the working of the sensor and simulate the same in a python code. Tkinter library was used to design the GUI and a simple timer service was used to update the register values over time. The data was collected using a set of API functions and was also stored in a CSV file which can easily be downloaded by the user. The application can also be synched with a cloud server, to monitor the sensor data remotely.

PS-I experience: There were both highs and lows throughout. I learnt about the various industrial practices that are followed while developing software and different principles to be followed while documentation. The company instructor was very helpful and always available to answer my doubts. The work can get monotonous sometimes however, as long as you take initiative you can learn a lot.

Learning Outcome: I learned about the product development cycle in the industry. I also became comfortable with 'Python', as I had little experience with it before.

Name: C ASHWIN . (2019A4PS0650G)

Student Write-up

Short Summary of work done: My project was to create a local control panel of a 3-axis gantry robot using Python and its libraries.

PS-I experience: It was good. It was a good experience collaborating with the team and working effectively in remote. Had interactions with the industry mentor who taught the industrial practices and concepts very nicely.

Learning Outcome: By the end of the project, students learnt python and the GUI libraries supporting python such as tkinter and some industrial concepts such as IoT and Industry 4.0

Name: RAVICHANDRA PARVATHAM . (2019A4PS1115P)

Student Write-up

Short Summary of work done: Had to develop the Graphical User Interface for a control panel of a 3-axis Gantry Robot. Gantry robots are used in factories to move around objects and automate processes. Our work involved using Python and the tkinter library to build a gui which accepts target coordinates and moves the robot. Along with this, it needed buttons to pick/place object and showed the real time status of the robot at all times.

PS-I experience: It was good, we had nice meetings with the mentor who was very nice and helpful. He taught us quite a bit about Industrie 4.0.

Learning Outcome: We learnt about Industrie 4.0, life cycle of product development, MQTT protocol and IoT. We learnt the tkinter library. Finally we learnt about programming in a team, documentation and testing.

Name: ABHISHEK MALAV . (2019ABPS0916P)

Student Write-up

Short Summary of work done: Shalaka develops industrial IOT devices for their clients. So we had to develop a python based GUI using TKinter library of local control panel for 3-Axid gantry robots.

PS-I experience: Overall it was a good experience. Industry mentor was helpful. we would keep meets separately with him to discuss our GUI and then he would give his feedback. For first few weeks, he taught us theory and then we had to develop GUI in last 1 or 1.5 weeks.

Learning Outcome: Main outcome was learning tkinter library in python. Other learning outcomes were mostly soft skills like communication, time management.

Name: SAURABH KALRA . (2019B5A40232G)

Student Write-up

Short Summary of work done: Shalaka conn devices is a company working in embedded systems, approx 60 studens were there, each divided into groups of 5 and different projects were alloted to each team. Ours project was to develop a GUI in python for the control panel of a 3 Axis gantry robot, in the initial half of our ps, 1hour sessions were held each day by our industry mentor mr Hemant kamat who is also the CTO of shalaka conn. devices. In those sessions he explained how industry functions and how IIOT works. He also explained the architecture of the projects and how all the projects are interconnected, then we had to make a design document for our project, which had to include the design of our code before we actually write it. The last phase of the PS included the coding part, in which we coded in python to create a working GUI, due to online mode many limitations were there as we couldn't do hardware testing of our code on a actual gantry robot, also hardware embedded systems couldn't be used so the groups also had to make simulations.

PS-I experience: Overall experience was good and got to learn a lot of things, but obviously things had been much better if we were physically on the stations.

Learning Outcome: Learning outcomes include both technical and soft skills and also industry knowledge, technical skills included python majorly and some part of MQTT protocol, soft skills include communication and presentation.

Name: ASHISH KUMAR SINHA . (2019B5A41042G)

Student Write-up

Short Summary of work done: We had to make a GUI for simulating an inertial measurement unit sensor. An IMU gives the acceleration, tilt and magnetic field of the device along 3 axes. After that the data had to be saved in a CSV file using a python script.

PS-I experience: Our mentor was a very helpful person. The only problem was it being an online PS we could not interact as much. Overall experience was fine.

Learning Outcome: I learnt python based GUI programming for which we used tkinter python library.

PS-I station: Sirius Motor Sports , Chennai

Student

Name: EKANSH GUPTA . (2019A4PS0368P)

Student Write-up

Short Summary of work done: We had the task to optimise the powertrain of an electric light motor vehicle. As a result, we had to decide the motors that can provide enough power along with battery capacity for an optimum range. Then finally we implemented a gradient descent function that tried to maximise the predicted range by changing the gear ratio.

PS-I experience: It was great, the station mentors provided a deeper insight on the working of automobiles and how engines are tuned and were patient in clearing our doubts.

Learning Outcome: Ricardo Ignite, Simulink, Simscape, engine tuning

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Name: PARTH SABOO (2019A4PS0457P)

Student Write-up

Short Summary of work done: Project:- Parallel Hybrid Powertrains Engine Optimization

- Demonstrated various hybrid vehicles available in the market today and how do they work - a brief study of motor, battery , control logic etc. (Data Collection)
- Determined realistic expected outcomes of a hybrid engine in terms of emissions reduction, fuel efficiency improvements etc. (Experimental study)
- Identified various SOPs offered by various governments around the world for hybrid vehicles and subsequently the sales figures of hybrid vehicles in respective areas. (Case Study)
- Prepared a look-up able which enlightened upon the torque distribution between CI engine and the Electric Motor. Primary aim was to reduce NOx emissions and our group was able to reduce them by a factor of 100(keeping in mind we neglected the effect of other engine parameters due to limited time constraint.

PS-I experience: All learning tutorials were provided from Day 1 and they covered most of the concepts, even a student from non-technical background could harness most out of it. Besides this, our industry mentor Mr. Sajeeth Kumar provided access to a 2-day Virtual Engine Dynamometer testing software on ReynLabs which ultimately helped me in understanding broad spectrum of use of dynamometer for Engine tuning.

One significant drawback was access to very less data. Future work includes collecting significant amount of data so as to implement regression models to to prepare the torque distribution look-up table.

Learning Outcome: Since, I have completed IC engines(CDC) and Automotive Vehicles(DEL) by the end of sophomore year, hence I was very well acquainted with IC engines and various other subsystems of an automotive vehicle and in Sirius Motorsports, this knowledge was extensively used in my daily activities including engine performance parameters, requirement and advancement of Hybrid Electric Vehicles and their working, etc. All in all, it turned out to be a great learning experience at Sirius Motorsports from perspective of industrial and academic skills.

Name: RISHAV KUMAR . (2019A4PS0482G)

Student Write-up

Short Summary of work done: My PS project was IC Engines Downsizing and Forced Induction. Its a concept used today by most companies to meet emissions standards(BS VI, Euro VI) with same power produced with less fuel and emissions. The project involved going through all the topics and then using the concepts learned to model and then downsize engine on Ricardo Wavebuild. And further compare the emissions and torque obtained between the engines for various RPMs.

PS-I experience: PS-1 was organized in a very structured manner. All the quiz, seminar, dates/deadlines were communicated well before in advance. My PS faculty Md. Raza Sir was also very helpful and responded quickly on any problem.

Learning Outcome: I learned various facts about engines and how valves, bore, stroke, rpm, torque, air fuel ratio are interdependent on each other. Also, how the timings of each action within an engine can impact the outcomes. My project involved continous use of Ricardo Wavebuild , Simulink ; so I m well comfortable with the softwares after the project.

Name: VEDANT RAKESH ABROL . (2019A8PS0659G)

Student Write-up

Short Summary of work done: designed and simulated portable electronic charger for electric vehicles

PS-I experience: learnt new skills, good experience

Learning Outcome: able to simulate on MATLAB SIMULINK/Design portable electronic charger

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Name: SHASHWAT UPADHYAY . (2019B4A40785P)

Student Write-up

Short Summary of work done: Our project aim was to take different blends of ethanol in gasoline as our fuel and analyze its effect on various performance and emission characteristics like BSFC, Brake torque, NOx emission, etc. Also, we made changes in spark advance and AFR to see how these blends are reacting to these changes. Finally, we compared these blends to find the most optimal blend for the current scenario.

PS-I experience: Overall, my PS1 was a wonderful experience. Initially, it was looking like a challenge due to its online nature, but everything went quite smoothly. Lectures given by our industry mentor were knowledgeable and easy to understand. Our faculty in charge was really supportive, and even my teammates were quite friendly and always ready to do any task.

Learning Outcome: Gained knowledge on IC engine performance and emission parameters. Learned various functions of Ricardo wave-like how to blend two fuels, how to get plots on different parameters, etc. and we also did basic modeling on MATLAB-

Simulink. PS1 also helped in improving my soft skills through various group discussions and seminars. Overall, it was a productive learning experience.

PS-I station: Solar Energy Corporation of India-Mechanical , Delhi

Student

Name: BAPAT ASHWIN SHYAM . (2019A4PS0538G)

Student Write-up

Short Summary of work done: The title of my project was "Assessment of Turbine Energy Resource of Wind Power Plants", which involved various types of case study (research based) analysis which further contained studying and inferring real life research locations (where an actual project had been done). The study also contained mathematical as well as software-related part which was involved in the process of wind turbine site assessment. There were 3 major case studies, (and one industry project insight) which have been deeply studied and compiled into a report.

PS-I experience: Since it was an online practice school course, the workload was less compared to that of offline scenario, but at the same time the research articles were very interesting and something new to learn. So, in a nutshell, It was a one time opportunity to learn about the working of wind plants in the country. It was a smooth journey, and with the help of my industry mentor and PS faculty, I gained few technical and soft skills.

Learning Outcome: Interacting with industry mentor and attending seminars with other people from the company helped a lot in soft skills development like GD skills and presentation skills, along with the knowledge of how exactly a company handles a real life project.
As a result of my work during the duration of PS-1, I got decent industry exposure. I learnt how projects are implemented in an organization from the initial stage to the final stage and its documentation, along with development of a sense of teamwork and persistence.

Name: ABHINAV KUMAR . (2019A4PS0690H)

Student Write-up

Short Summary of work done: My project was divided into two parts, the first part was a literature survey and analysis of the commercially available electrolyzers and their specifications to evaluate the best-suited electrolyzer for a 250kW hydrogen production plant. This made me compare the specifications and quality of the machine within the Company and among the competitors for a better understanding of their specifications and to get to know which machine is well suited for a particular hydrogen production plant.
The second part of the project was involved designing a basic electrolyzer plant with all its specifications.
In this part, I did in-depth research on solar energy systems to develop an optimum clean energy solution for the hydrogen plant.
The research majorly talks about the future of green hydrogen production.

PS-I experience: It was a great learning experience and I gained a lot of theoretical knowledge from working on my project. My guide was very helpful and I got a project that was both interesting and learning oriented and the help that I got from my faculty in-charge helped me complete my project in time.

Learning Outcome: Learned a lot in the domain of renewable sources of energy and use skills such as Data analysis, Scientific comparison of data, Study of engineering diagrams, Cost analysis to design a report on the working of a hydrogen plant.

Name: PRAKHAR AGARWAL . (2019B1A41092G)

Student Write-up

Short Summary of work done: So my PS project title was to develop a business model for the grid solar rooftop systems. Solar panels are quite expensive and i.e. not everyone is able to afford them. So I built up a business model that would solve this problem and encourage common people to install solar PV systems on their rooftop.

PS-I experience: The experience was pretty good. I chose this PS station as it comes under the Central Government Ministry. The project title I got could have been a bit better as I was hoping for some technical involvement in it. However it was a decent PS experience.

Learning Outcome: I learnt various government policies. The guest lectures by the faculty were brilliant. I learnt how to calculate the various terminologies associated with solar power and energy such as air mass , solar elevation angle, solar declination angle, tilt angle etc. I got a brief idea about what it takes to build up a business model. The experience would have been better had this been held in the offline mode.

Name: KANISHKA AWASTHI . (2019B5A41101H)

Student Write-up

Short Summary of work done: My project was basically aimed at designing of a typical 12 KW (DC) / 9 KW (AC) solar PV rooftop power plant at Organization's office rooftop site. So, I was able to design it with the appropriate software used and with the help of my advisor to whom I was assigned. I was able to get a good performance of the design in the end and also I got it to be economically feasible. Also, I started off the project with the company research, background research and component analysis of the design I'll be making in the project. I was able to figure out the losses too during the project and minimized them as well.

PS-I experience: It was professionally enriching and extremely delightful to work for a top government organization such as SECI. Also I got a very helpful industry advisor who always had my back. So ,all in all a beautiful experience.

Learning Outcome: I came to know what it is like to work for a big government organization. I learnt how to do and complete my work with diligence and how extremely important is it to follow deadlines. I came to know and understand the solar world in respect to which my project was based and I also got to understand the full working of a typical solar energy producing system. The pre-research greatly helped.

PS-I station: Sud-Chemie India Pvt.Ltd-Catalysis and carbon capture , Vadodara

Student

Name: VIGNESH SREENATH . (2019A1PS0699P)

Student Write-up

Short Summary of work done: The project I was given was related to secondary research through the Internet on the topic of Carbon Capture & Storage. I was tasked with the collection of information pertaining to 4 carbon capture technologies namely Absorption, Adsorption, Calcium Looping and Chemical Looping by going through research articles over the internet from reputed sites like Science Direct, ACS Publications, RSC Publications, and Researchgate etc. Further, the information collected from these articles was tabulated in an MS-Excel Worksheet which encapsulated the technology used (like Adsorption or Calcium Looping), author's name, the journals name, the abstract and finally the advantages of using the technique along with any another relevant information on the technologies. I did the above set of tasks for about 100 research articles. After this, I was asked to analyze the information from the articles and document the suitability and pros / cons of each technology in the context of carbon capture – this was documented in MS-Word. So, I had 2 deliverables – one, an MS-Excel Worksheet and two, an MS-Word document.

PS-I experience: The project allotted to me on Carbon Capture & Storage was of interest to me given my interest in environmental sustainability in general. Also, given the Covid19 pandemic, I was assigned a project based on secondary research on the Internet, which was ideal given that I was not present at the PS-1 Station physically for the project. The Industry Mentor I was allotted guided me in every way possible and cleared any doubt I had in a simple & understandable manner. The work I was entrusted opened the doors of research articles to me and on how to analyze and get relevant information from scientific research articles. The articles opened my eyes to the kind of technologies which are available to put a brake on pollution and global warming which have been on a rise over the last few decades in particular .The PS-1 Faculty Mentor (Satyapaul Singh Sir) has been very helpful throughout the course of the PS programme & has always cleared

my doubts in a simplistic manner. Satyapaul Sir gave some really useful tips on how a report is to be presented and also tips on how the skills could be improved in a GD by giving a list of do's and don'ts. The tips and guidance sir gave really helped me and will in my opinion greatly help me in the future as well. All in all I will like to say that my PS-1 experience was quite a pleasant one.

Learning Outcome: To be completely honest the PS-1 programme was a great experience learning wise. It taught me how to search for Research Articles which has been always quite fascinating for me and my Industry Mentor guided me on how to do so using appropriate key words to just get the kind of articles required. Another important learning was learning on how to do the collation of relevant information. At first it was quite a challenge for me on how to find relevant information from scientific research papers, which were quite technical in nature, but over time I did get a hang of it and it was a great learning experience. Another important learning was on how to match up to the work expectations. PS-1 being the first exposure to industry greatly helped me in understanding on how to deal with expectations and being able to deliver what is required in the stipulated frame of time. Finally, the most important learning outcome to me was the domain knowledge I gained in an area of emerging global importance. This project opened up the world of Carbon Capture to me, which is one of the most important technologies in the fight against climate change, especially so given my interest in environmental sustainability which I also talked about earlier.

PS-I station: Sud-Chemie India Pvt.Ltd-CFD analysis , Vadodara

Student

Name: ADITHYA SURESH (2019A1PS0847G)

Student Write-up

Short Summary of work done: My project was titled 'Extraction and Recovery of Transition Metals from Spent Catalysts'. My project's goal was to identify an alternative to zinc, which is employed as a cementing agent in platinum group metal cementation. I compared the different properties of the metals which are possible alternatives for zinc. I compared the cementation rates, consumption rates, potential differences as well as various environmental factors to come to a conclusion. The second part of my project was to compare the different methods used for the individual separation of PGMs. I focussed

mainly on the conventional precipitation method and the solvent extraction method keeping in mind their selectivity, primary yields, recycling steps etc.

PS-I experience: Despite being a work from home internship, it was conducted in a smooth manner. The faculty in charge and company instructor helped me with the required advice and assistance during the course of the project.

Learning Outcome: Learned about the working and importance of catalytic converters inside vehicles and why it is necessary to recycle the metals which are used in these converters as catalysts. The presentations and groups discussions helped me in improving my soft skills . Constant interaction with my mentor in regards to the various aspects of my project also helped me to have a better knowledge about the organizational functions.

PS-I station: Vasantha Tool Crafts Pvt Limited-Mechanical , Hyderabad

Student

Name: BANDARU BHAVANI SHANKAR . (2019B5AB0588P)

Student Write-up

Short Summary of work done: We have derived an equation which is used to calculate the cooling time of the plastic part in the mould . The solution is obtained by solving the heat equation for variable boundary conditions.

PS-I experience: It was a good experience helping me to get some technical knowledge.

Learning Outcome: I learnt something new about how the job of mechanical engineer will be.

PS-I station: Vikram Cement Works - Industrial Automation & Control , Neemuch

Student

Name: JAKKA SRISHANTH REDDY . (2019A8PS0649H)

Student Write-up

Short Summary of work done: We have worked on PLC logics for various applications and scenario and industry 4.0

PS-I experience: I haven't got industrial experience, but PS-1 was helpful to improve my communication skills and got to know about the working of industries .

Learning Outcome: Got to know about PLC and improve my communication skills

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Name: DARSHAN PRAVIN BHANGALE . (2019B4A80800G)

Student Write-up

Short Summary of work done: Plc logic for various applications and scenario

PS-I experience: Good

Learning Outcome: Learned about PLC

PS-I station: Viram Technologies Enterprises - Mechanical (Piping and thermal analysis) , Pune

Student

Name: NAYAK SAMEERAN . (2019A4PS0513P)

Student Write-up

Short Summary of work done: Firstly we had to select suitable material for the combustor. We shortlisted a few materials based on the given temperature and pressure values. We concluded that some super-alloys are suitable for the given design parameters of the combustor. Next, we had to model the combustor from a given 2D drawing with appropriate dimensions. We used SolidWorks to develop the combustor model. Finally, we performed a thermal stress simulation based on the given temperature and pressure values and determined the linear and radial expansion of the combustor. The thermal stress simulation was performed in Fusion360.

PS-I experience: The overall experience was good. Orientation was well organized and helped me understand the structure of the organization. I was able to understand the nature of work and projects. The learning environment between the organization and students was very encouraging. I was able to adjust well to the team assigned. The experience gave me a chance to enhance my presentation skills and communication skills.

Learning Outcome: This project helped us understand the basic aspects of material selection, and different classes of materials based on their temperature and pressure handling properties, how pipes are designed effectively to minimize the effects of thermal expansion on them, modelling in CAD software, and performing thermal simulations to obtain the desired results. I also learned non-technical skills like teamwork, delivering presentations, writing reports, and keeping regular records of the progress we made through Diary Writing.

PS-I station: Viram Technologies Enterprises - Mechanical (Process equipment design) , Pune

Student

Name: VINAY KUMAR . (2019A4PS0843G)

Student Write-up

Short Summary of work done: My group project was to do thermal and mechanical designing of a shell and tube heat exchanger. I also had to draw CAD drawings of tube arrangement and baffle arrangement inside the shell.

PS-I experience: PS-1 experience was good but I believe it could have been better had the PS been offline.

Learning Outcome: Learning about industry standards and development of soft skills.

Name: MUTYALA VENKATA SAI RAM PRABHAT (2019A4PS1331H)

Student Write-up

Short Summary of work done: We have done thermal and mechanical design of shell and tube heat exchanger. We referred research papers, books, and many videos on thermal and mechanical design. We have done the Thermal design calculations and found out heat transfer area, number of tubes, pitch, bundle diameter, shell diameter, overall heat transfer coefficient, pressure drop.
From Mechanical design calculations, we obtained thicknesses for different materials required to construct a heat exchanger. We also showed CAD drawings of tube arrangement and baffles.

PS-I experience: PS-1 has been wonderful opportunity to learn new things .We were divided into teams and projects are allocated.Our mentor explained the concepts required and always cleared our doubts.I have learned many new things through the project. Overall it was a good experience.

Learning Outcome: I improved my soft skills during PS-1, got good exposure to a professional work environment, and learned many things from the project.

Name: KALAKOTI SAKETH REDDY . (2019B5A41114H)

Student Write-up

Short Summary of work done: Our project was to do the thermal and mechanical design of shell and tube heat exchanger.
Then we draw the CAD drawings of the design showing the tube arrangements and baffle arrangements that we did inside the shell

PS-I experience: PS-1 was a good experience, would have been much better had we got hands on experience, an exposure to the industry would have helped us get to know more about the industry

Learning Outcome: presentation and communication skills and also about industrial standards

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PS-I station: Wadia Institute Of Himalayan Geology , Dehradun

Student

Name: SUCHAY JHA . (2019B1A21052P)

Student Write-up

Short Summary of work done: Quite satisfactory

PS-I experience: It was amazing. I got to learn so many new things.

Learning Outcome: Very good.
