Birla Institute of Technology & Science (BITS), Pilani
Practice School Division
Practice School-I course (May 28th – July 23rd, 2024)

PS Chronicles (Healthcare)

(A compilation of student experience during PS-I)

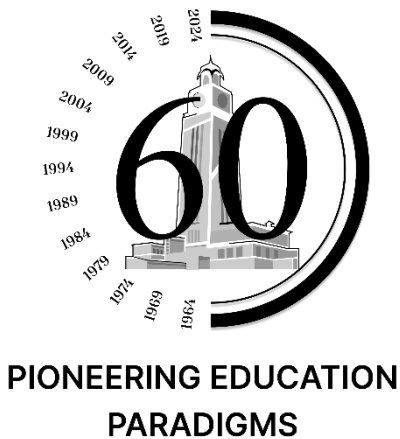Pilani Campus

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From the Desk of the Editor

It is my great pleasure to bring forth the 6th edition of the PS-I Chronicles. This edition features over 1059 articles from PS-I students sharing their experiences during summer 2024.

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 six categories based on the industry domain.

➢ Chronicle 1: Information Technology

➢ Chronicle 2: Electronics

➢ Chronicle 3: Chemical, Mechanical, Cement, Textile, Steel, Infrastructure & others

➢ Chronicle 4; Health Care

➢ Chronicle 5: Finance and Management

➢ Chronicle 6: Government Research Labs

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, Prof. M. K. Hamirwasia and Dr. G Muthukumar for reviewing the articles and providing us the feedback. I would also like to extend my thanks to Mr. Om Prakash Singh Shekhawat, Mr. Shyam Sunder Saini 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 murugesan@pilani.bits-pilani.ac.in.

S. Murugesan

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PS-I station: Ananta Medicare Limited, Sriganganagar

Student

Name: MUKUL DEV (2022A5PS1441P)

Student Write-up:

PS-I Project Title: Understanding the manufacturing process of dry powder injectables and solid oral formulation.

Short Summary of work done: Performed some quality control testing and learn about different instruments like HPLC, AAS, pH meter etc.

Objectives of the project: To learn about the testing and production and process involved in parenteral dosage form.

Tool used: Pharmaceutical tools

Details of Papers/patents: NA

Brief description of the working environment: The working environment is collaborative and modern, featuring team-based projects, open communication, and the latest technology. The company expects high standards of professionalism, punctuality, innovation, and teamwork from employees. During the Professional Skills (PS) period, individuals can expect to enhance their technical skills, soft skills, industry knowledge, and personal development, gaining valuable hands-on experience and insights into industry practices and trends.

Academic courses relevant to the project: Yes some course of pharmacy helped in the project. Like process engineering, pharmaceutical analysis etc.

Learning Outcome: About Parenteral dosage form

PS-I station: Deep Tek Medical Imaging Private Limited, Pune

Student

Name: AKSHAY SHUKLA (2022A7PS0087P)

Student Write-up:

PS-I Project Title: Reduction Of Model Footprint

Short Summary of work done: We were given a list of articles and courses to go through in order to get accustomed with the topics that we were going to engage with in the course of the internship. We were then given a few hands-on projects dealing with the Fashion MNIST dataset, chest X ray dataset and the Covid 19 dataset. These projects dealt with building a classifier and performing model quantisation.

Objectives of the project: Learning how to build a neural network from scratch and fine-tuning it so that the model can efficiently make predictions on the given dataset.

Tool used: Tensorflow

Details of Papers/patents: NA

Brief description of the working environment: We were given a lot of freedom with the work timings as long as we did not stretch the deadlines too far.

Academic courses relevant to the project: AI/ML/DL

Learning Outcome: Neural Networks, Model Quantisation

Name: PATEL NIRJAR DINESHBHAI (2022A7PS0168P)

Student Write-up:

PS-I Project Title: Image Segmentation

Short Summary of work done: The image segmentation project on car images employed PyTorch and Albumentations for preprocessing and augmentation. The dataset was structured with images and corresponding masks, focusing on precise pairing for accurate segmentation. A key technique, progressive resizing, involved gradually increasing image sizes during training to enhance model performance and generalization, as demonstrated in a related Kaggle notebook for lung segmentation. Training included

detailed logging of metrics like `train_loss`, `val_loss`, `val_acc`, `val_dice`, and `val_iou` using MLflow. This systematic approach provided deep insights into the model's performance, facilitating continuous improvement. Albumentations enabled advanced transformations, making the model more robust to diverse real-world scenarios. Google Colab was the primary development environment, offering the computational resources necessary for extensive training and experimentation. This setup ensured smooth workflow and efficient resource management. The combination of advanced techniques and tools reflects a robust approach to image segmentation, emphasizing meticulous data handling, sophisticated augmentation, and thorough performance tracking to achieve accurate and reliable results.

Objectives of the project: To segment images of various objects into different masks

Tool used: PyTorch, Google Colab, MLFlow, GitHub, Various libraries of PyTorch

Details of Papers/patents: None

Brief description of the working environment: At our company, the working environment is dynamic, collaborative, and innovation-driven. We emphasize continuous learning, creativity, and teamwork, offering access to cutting-edge technologies and tools for diverse projects. Teamwork is essential, with regular brainstorming sessions and cross-departmental collaborations. We encourage experimentation and the pursuit of new ideas, supporting calculated risks. To promote work-life balance, we offer flexible hours and remote work options. Employees have access to online courses, workshops, and industry conferences to stay updated with the latest trends. We expect high-quality work, attention to detail, and excellence in every project. Proactive problem-solving, effective communication, and adaptability are crucial. Clear and concise communication within the team and with clients ensures alignment and transparency. Overall, our company provides a supportive and stimulating environment where employees can grow professionally, contribute meaningfully, and achieve their career goals.

Academic courses relevant to the project: Machine Learning, Deep Learning

Learning Outcome: Learnt about Deep Learning concepts and its applications in medical sectors

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Name: TARUN RAO (2022A7PS1174P)

Student Write-up:

PS-I Project Title: Exploring Vision Transformers

Short Summary of work done: It started with studying the basics of CNNs and then judging how it works for different classification and segmentation tasks. Later on studying ViT for performing the same.

Objectives of the project: To explore the working of Vision Transformers in the field of medical imaging

Tool used: Google Colab, PyTorch

Details of Papers/patents: NA

Brief description of the working environment: As it was an online internship, we were continuously in touch with our mentor.

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

Learning Outcome: Learnt about how different convolutional networks and ViT works and how and where to choose the required model.

Name: TUSHAR ANAND (2022B3A71371H)

Student Write-up:

PS-I Project Title: Building a Model for Medical Image Classification and Quantization Applications

Short Summary of work done: We were tasked with creating 3 classification model. The first model was the to classify clothing items, this was done so that we can get familiar with coding/python. The second task was to classify lung images as having or not having pneumonia. This task was basically meant to get us familiar with working with xray images and the preprocessing and other techniques used to work with them. The last task was to classify xray images of lungs as covid,normal, pneumonia or lun opacity. We applied our knowledge form the previous 2 tasks to complete this 3rd task. After completing the 3rd task we were asked to quantise the models using various techniques like post quantisation training, mixed precision etc.

Objectives of the project: As the complexity of models is increasing, the hardware is not able to keep up. The goal of this project was to implement methods to reduce the size of AI models, the practice of reducing model size is called quantization.

Tool used: python, tensorflow, pytorch, google colab, kaggle

Details of Papers/patents: None

Brief description of the working environment: As the PS was online I didnt have much interaction with the staff at the company. Our mentor was Prajwal Bende. He was very helpful and supporting. He used to hold meeting with everybody where we went over evryone's results and code. He helped us improve our code and provided us with ample resources to learn about quantisation.

Academic courses relevant to the project: M2, CP, ML, DL

Learning Outcome: I got hands on experience with deep learning libraries like tensorflow and pytorch. I got to learn the theory behind quantisation and maths behind neural networks.

PS-I station: Edhaa Innovations Private Limited - Management, Mumbai

Student

Name: RUCHA VILAS KULKARNI (2022A5PS1413P)

Student Write-up:

PS-I Project Title: Evaluation and bioanalysis of diagnostic products

Short Summary of work done: In the duration of PS-I, I worked on 2 major projects that were invasive glucose monitoring and nanocellulose extraction. For the glucose project my main work was to do the literature review and come to a desirable conclusion also i did a few trails for the same. My second and most important project was nanocellulose extraction wherein we targeted to extract nanocellulose from an organic compound and do it's characterization, we did succeed in the extraction of nanocellulose from a very desirable material.

Objectives of the project: Literature study and experimentation of glucose monitoring and nanocellulose extraction.

Tool used: UV- spectrometry

Details of Papers/patents: Can't be disclosed because of the company policy.

Brief description of the working environment: Working at edhaa innovations was indeed a great learning experience. I got to learn many things like how actually a start up works, how your each and every step would affect the final results, how to work with a team, how to manage things at critical times.

Academic courses relevant to the project: Pharmaceutical formulation and physical pharmacy.

Learning Outcome: How a startup actually works, hands on experience in experimentation, how to do a proper research.

PS-I station: Himalaya Rehabilitation Aids - Mechanical, Dehradun

Student

Name: GARVIT BHARDWAJ (2022A4PS1220G)

Student Write-up:

PS-I Project Title: Quadriplegic walking in exoskeleton

Short Summary of work done: I worked on research and development of new products for the company.

Objectives of the project: To make exoskeleton and test it

Tool used: Autocad, fusion 360

Details of Papers/patents: Nil

Brief description of the working environment: Very good working environment and very helpful group of people, learned new things.

Academic courses relevant to the project: Engineering Graphics

Learning Outcome: New learning about mechanical drawing tools and mechanics of tools.

Name: TAMANNA REKHANI (2022ABPS1605P)

Student Write-up:

PS-I Project Title: Evaluation of supply chain processes for wheelchair production at Himalayan Rehabilitation Aids.

Short Summary of work done: I conducted in-depth research on products and market competitors, reviewed compliance with healthcare regulations, and explored new technologies for supply chain management. I prepared questionnaires, presentations, and detailed reports, contributing to strategic decision-making and process improvements. This experience enhanced my research, analytical, and presentation skills while providing valuable insights into the healthcare products industry and supply chain management.

Objectives of the project: Improving efficiency, reduce costs, enhance customer satisfaction.

Tool used: Canva

Details of Papers/patents: NA

Brief description of the working environment: During my PS-I internship at Himalayan Rehabilitation Aids, I worked in a dynamic and collaborative environment focused on healthcare products and rehabilitation aids. The company fostered a professional atmosphere with open communication and a commitment to quality and innovation.
Expectations from the Company: I anticipated gaining hands-on experience in research and analysis, understanding industry regulations, and contributing to real-world projects. I expected to engage with various departments, learn about compliance and quality assurance, and apply new technologies to enhance supply chain processes.
Learning During PS-I: The internship provided me with a comprehensive understanding of healthcare product manufacturing and market dynamics. I developed strong research and analytical skills by exploring market trends, competitor strategies, and regulatory standards. I also improved my ability to prepare and present detailed reports, gaining insights into compliance procedures and quality assurance. The experience broadened my perspective on customer needs and industry demands, and I learned to navigate complex regulations and integrate new technologies into supply chain processes. Overall, the internship was a valuable learning experience that deepened my knowledge of the healthcare sector and enhanced my professional skills.

Academic courses relevant to the project: Supply Chain Management, Healthcare Management, Product Development and Innovation, Quality Assurance and Control
Learning Outcome: Enhanced research and analytical skills through market research and competitor analysis.
Strengthened understanding of healthcare regulations and quality assurance processes. Improved presentation and communication skills through report writing and presentations.Insight into healthcare product manufacturing processes and market dynamics.
Understanding of customer needs and market demands in the rehabilitation aids sector.

PS-I station: Hyderabad Eye Institute (DBA - L V Prasad Eye Institute), Hyderabad

Student

Name: SRIDIVYA VAJJHALA (2022A5PS1254H)

Student Write-up:

PS-I Project Title: Game-based learning

Short Summary of work done: To develop the educational game, I first looked into existing games at LVPEI on an internet platform called Wordwall. This helped me understand the criteria for a typical educational game. I also read 26 research articles to gather case studies. We chose Soft Contact Lens Complications to base our game on because there were few games in that genre. Inflammatory disorders are patients' most common soft contact lens difficulties, and we chose Contact Lens Papillary Conjunctivitis (CLPC) as our prototype. I created my educational game by drawing comparisons to current games and started with jigsaw puzzles. The game was created using Scratch 3.0 and features two rounds. The first round involves a hypothetical encounter between an optometrist and a patient with CLPC. Slit lamp images are presented, and the most salient symptoms are chosen and arranged accordingly in the game.

Objectives of the project: Creating an online serious game to teach soft contact lens complications to optometry students.

Tool used: Scratch 3.0

Details of Papers/patents: NA

Brief description of the working environment: WORKING ENVIRONEMNT WAS VERY PROFESSIONAL AND FRIENDLY AT THE SAME TIME. MY EXPECTATION WAS TO DESIGN AN EDUCATIONAL GAME FOR CONTACT LENS COMPLICATIONS AS THERE ARE LITTLE TO NO EDUCATIONAL GAMES IN THE AREA OF RESEARCH. I LEARNT HOW TO SCRATCH 3.0 THROUGH PS-1.

Academic courses relevant to the project: CP

Learning Outcome: Learnt how to use a scratch programming language to teach optometry students about the various contact lens complications.

Name: KRISHNA SAI GAYATRI VEDANTAM (2022B4AA1586H)

Student Write-up:

PS-I Project Title: Designing an Activity Book Based on Vision and Eyes (LVPEI'S ABOVE) with original concepts, illustrations and layouts

Short Summary of work done: I was given the task of designing an entire Activity Book on Eyes and Vision, based on the prompts and suggestions given by my mentor. I had to come up with feasible means of conveying LVPEI's requirements for the book. Learnt how to use a DTP Software from scratch. Came up with activities, written matter, illustrations, layouts etc. for the book. Had the wonderful opportunity to interact in depth with many employees at LVPEI, including Communication Dept. Interns, Department Heads, Doctors and Assistant Director, Director, Network Director of Standard Chartered-LVPEI Education Academy. Most of my work was done via almost daily online meets, as prescribed by my mentor.

Objectives of the project: To create an Activity Book to be circulated throughout the LVPEI Network, To urgently raise awareness about eye conditions

Tool used: Scribus - DTP software, Canva for some templates, Sketchbook for digital drawings

Details of Papers/patents: My IP is slated to be used in multiple future products by the organisation

Brief description of the working environment: Complete opposite of the stereotype of PS1. I expected a simple project with little to no involvement from my side, only observation. However, the opportunity I got was life-changing. I got to interact with the employees of every department of LVPEI, including the senior level directors. I was given complete creative freedom, and was expected to present and vouch for my ideas as a working professional rather than a mere intern. I understood the importance of a work/life balance. I also learnt a lot about the importance of camaraderie in the workplace. In terms of technical skills, I learnt a lot about the meticulous process of designing and publishing a book. I also learn a lot about eye health and eye care while compiling material for the book.

Academic courses relevant to the project: CP

Learning Outcome: 1. Learned how to design a book for printing purposes 2. Learned about creating Intellectual Property 3. Real-world application of creative skills 4. Learnt how to use DTP Software

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PS-I station: Laurus Labs, Anakapalle

Student

Name: SAYANDEEP DUTTA (2022A5PS1412P)

Student Write-up:

PS-I Project Title: A detailed overview and Case study of Tablet Manufacturing

Short Summary of work done: Visit to the manufacturing area of tablet and understanding the manufacturing processes, visit to quality control section, which conducts verification tests, visit to quality assurance section, API production block and effluent treatment plant. Understanding of the whole process of tablet manufacturing from API development to that of packaging. Understanding supply chain management of the products.

Objectives of the project: Tablet Manufacturing and Quality Control

Tool used: Microsoft word, Microsoft powerpoint

Details of Papers/patents: NA

Brief description of the working environment: Working environment was good, worker friendly , senior employees were very helpful in making us understand about the company and the pharmaceutical industry in detail. Expectations from company is that they recruit interns in future for both PS -1 and PS-2 and suggest accommodation for interns/new employees as the location is remote and accommodation is limited. Learning about tablet and capsule manufacturing in detail and knowledge of the pharmaceutical industry at the closest level.

Academic courses relevant to the project: Pharmaceutical formulations - 2, Instrumental methods of analysis, medicinal chemistry.

Learning Outcome: Understanding of tablet and capsule manufacturing in the pharmaceutical industry.

Name: KINTAN VERMA (2022A5PS1416P)

Student Write-up:

PS-I Project Title: Introduction to Tablet Manufacturing

Short Summary of work done: During my 2-month internship at Laurus Labs Unit 2, offered by BITS Pilani, I studied the introduction to tablet manufacturing. The process involves several critical stages to ensure the production of high-quality pharmaceutical tablets. Tablet manufacturing begins with the formulation development, where the active pharmaceutical ingredient (API) is blended with excipients to create a uniform mixture. The next stage is milling, where the granules are milled to a uniform size, ensuring consistency in the final tablets. This is followed by blending, where additional excipients might be added to the granules to enhance the final product's properties. The compression stage is where the granules are compressed into tablets using a tablet press. This equipment exerts significant pressure to form tablets of the desired size and shape. Key considerations during compression include maintaining uniformity and preventing defects such as capping or lamination. Finally, the tablets may undergo coating, which can serve multiple purposes like masking the taste, enhancing stability, or controlling the release of the API. Quality control tests, such as hardness, disintegration, and dissolution tests, are performed to ensure the tablets meet the required specifications.

Objectives of the project: To gain practical knowledge in the field of tablet manufacturing from start to end.

Tool used: Microsoft word, Microsoft powerpoint

Details of Papers/patents: Process of preparation of 2-Amino 5-Hydroxy Propiophenone.

Brief description of the working environment: Laurus Labs offers a professional and dynamic working environment that is well-suited for an internship program. As an intern, you can expect to be part of a collaborative team focused on innovation and excellence in pharmaceutical manufacturing. The lab facilities are state-of-the-art, equipped with advanced analytical instruments and manufacturing equipment, providing a hands-on learning experience.

Interns at Laurus Labs can expect:

Exposure to Industry Practices: Interns gain practical insights into pharmaceutical processes, including formulation, granulation, milling, blending, compression, and quality control.

Guidance from Experts: The lab is staffed with experienced professionals who provide mentorship and guidance, ensuring that interns understand both theoretical and practical aspects of their tasks.

Emphasis on Quality and Safety: Laurus Labs maintains high standards of quality and safety, adhering to regulatory requirements. Interns will learn the importance of precision and adherence to protocols.

Collaborative Work Culture: The environment fosters teamwork and collaboration, encouraging interns to engage with different departments and learn from various facets of the industry.

Professional Development: The internship program is structured to enhance technical skills and professional growth, preparing students for future careers in the pharmaceutical sector.

Recommending Laurus Labs for future internships will ensure that juniors from BITS Pilani receive a comprehensive, hands-on experience in a supportive and technologically advanced setting.

Academic courses relevant to the project: Pharmaceutical formulations-II, Pharmacology.

Learning Outcome: Learning basic principle and mechanism of granulation, compression, coating, blending, inspection machines and also how the quality of the product is maintained consistently throughout by the Quality control department.

Name: HARSH JHA (2022A5PS1425P)

Student Write-up:

PS-I Project Title: Detailed overview and case study of tablets manufacturing

Short Summary of work done: Learnt about various cleanroom procedures in pharmaceutical industry, and also learnt about all the processes of tablet manufacturing from dispensing of the raw material to packaging of tablets also seen various engineering equipments like air handling units and effluent treatment plant also visited quality control department and reasearch and development of the company.

Objectives of the project: To learn about tablet manufacturing from start to end

Tool used: Microsoft word, Microsoft powerpoint

Details of Papers/patents: NA

Brief description of the working environment: The working environment of the company is best like all the staff and employees are very much supportive and eager to explain you everything about the process my expectation from this company was to know how a pharmaceutical industry works and what are the different parameters and process required for a oral dosage form to pass through all the required compliances before releasing into the market and all my expectations are fulfilled correctly.

Academic courses relevant to the project: Pharmaceutical formulations 1, 2, Instrumental methods of analysis, Process engineering, Physical pharmacy.

Learning Outcome: Learnt about how a pharmaceutical industry work

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Name: SOURADEEP DUTTA (2022A5PS1442P)

Student Write-up:

PS-I Project Title: A detailed overview of tablet manufacturing

Short Summary of work done: Explored different departments and the regulations that affect and run a tablet manufacturing plant.

Objectives of the project: Understanding the workings of a tablet manufacturing plant.

Tool used: Microsoft word, Microsoft powerpoint

Details of Papers/patents: None

Brief description of the working environment: The working environment is clean,meticulous and organized.

Academic courses relevant to the project: Pharmaceutical formulations 1 and 2, Process engineering, IMA

Learning Outcome: Better understanding of manufacturing processes

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PS-I station: Lenest, Mumbai

Student

Name: ANSH BHARGAVA (2022A3PS1091G)

Student Write-up:

PS-I Project Title: Email Automation and Unit Economics

Short Summary of work done: I have setup an automated email system for better patient relationship to give them weekly reminders,tips,birthday wishes and more. I also studied Unit economics in Maternal Healthcare and I compared Indias spending to other developing nations it was a great project too.

Objectives of the project: Email Marketing, PRM, CRM and Unit economics of maternal healthcare.

Tool used: Brevo a online tool

Details of Papers/patents: No Paper

Brief description of the working environment: It is a very good station didnt have much expectation initially but it turned out really great my advise to all juniors to please go and meet Dr.Mukesh interact and learn as much as you can from him.He is really informative a good coach,speaker and I enjoyed my time learning a lot from him.

Academic courses relevant to the project: Principles of Management

Learning Outcome: Data driven Decision making,CRM,Email Marketing, Multichannel marketing and analysis.

Name: KAVYA KASHISH (2022A5PS1426P)

Student Write-up:

PS-I Project Title: Design and Implementation of a Weekly Pregnancy Newsletter and Digital Content Strategy

Short Summary of work done: I participated in a variety of tasks that greatly contributed to my personal and professional growth. A key aspect of my responsibilities involved producing 40 weekly pregnancy newsletters and creating YouTube content focusing on women's health issues like dysmenorrhea and C-section procedures, which demanded thorough research and strong communication abilities. Furthermore, I delivered a presentation on the Decay Theory of Memory and delved into the influence of personality traits on career advancement, deepening my grasp of psychological theories. Through these experiences, I refined my communication, research, graphic design, and teamwork skills, while also establishing valuable professional connections. This internship offered a comprehensive educational opportunity by combining theoretical knowledge with hands-on practice, laying a solid groundwork for my future healthcare career.

Objectives of the project: The objective of this project is to engage and support pregnant women through the creation and distribution of weekly newsletters and digital content. Each newsletter is designed to provide valuable information and encouragement throughout the pregnancy j

Tool used: Canvas

Details of Papers/patents: NA

Brief description of the working environment: The internship at Lenest Maternity Hospital has equipped me with valuable knowledge and skills that will undoubtedly benefit my future career. The combination of theoretical learning and practical application, the enhancement of communication and technical abilities, and the establishment of significant professional connections have all contributed to enriching my professional path. Looking forward, I am eager to utilize these acquired experiences and insights to tackle upcoming challenges and seize new opportunities. This internship has not only prepared me for a career in healthcare but has also instilled in me a strong sense of purpose and dedication to making a positive difference in the lives of others. I am thankful for the learning opportunities provided by this internship and am excited to continue growing and developing in the healthcare sector.

Academic courses relevant to the project: Principles of Management

Learning Outcome: My time at Lenest Maternity Hospital during my internship has been truly transformative, leading to substantial personal growth in multiple aspects. The wide array of tasks and duties, combined with the supportive atmosphere, has played a crucial role in my development in communication, expertise, and self-understanding. This experience has not only provided me with essential skills but has also influenced my outlook on both personal and professional aspects of life.

Name: ANISHKA SHARMA (2022A8PS0583P)

Student Write-up:

PS-I Project Title: Health Economics and Professional Fatigue in Healthcare

Short Summary of work done: Project 1 (Main) - Health Economics: The main project focused on health economics in India's healthcare sector, emphasizing cost-effectiveness and cost-benefit analyses. Through extensive research, it explored factors influencing healthcare pricing, key indicators for efficient healthcare systems, and various pricing strategies. The study conducted detailed analyses of cost-effectiveness (CEA) and cost-benefit (CBA) approaches, highlighting their importance in resource allocation and policy formulation. A case study comparing the pricing of C-sections versus normal deliveries illustrated complex factors affecting healthcare costs. Major government initiatives like Ayushman Bharat Yojana and Pradhan Mantri Bhartiya Janaushadhi Pariyojana were examined, assessing their impact on healthcare accessibility and affordability. The report also analyzed financial implications of health economics, including spending trends, impact on GDP and productivity, and global investment patterns in the Indian healthcare sector. Recommendations included expanding successful government programs, prioritizing preventive care, and implementing value-based pricing strategies. The

conclusion underscored the critical role of health economics in developing sustainable, high-quality healthcare systems, and its potential to significantly improve health outcomes and drive economic growth; Project 2 - Impact of Fatigue on Healthcare Professionals: This project, based on thorough research, examined the severe understaffing in India's healthcare system, with doctor-to-patient ratios as high as 1:11,000 in some government hospitals. It discussed the Grossman Model of Human Capital and its relevance to managing healthcare worker fatigue. The study also included strategies to mitigate fatigue, such as implementing comprehensive wellness programs, ensuring adequate staffing ratios, promoting work-life balance, and improving work environments. These strategies aim to reduce burnout and enhance patient care quality; Helping on other interns' projects include - Research on Apollo Hospital, Da Vinci Robot, Model on Vaccine hesitancy, Digital Prescription, Unit Economics, Automatize Emails etc.

Objectives of the project: Analyze Healthcare Delivery Costs: Investigate financial implications of various delivery methods, focusing on caesarean sections and normal deliveries; Assess Impact of Healthcare Professional Fatigue: Examine prevalence and effects of fatigue on deliver.

Tool used: Statistical Analysis: For quantitative analysis of healthcare costs and outcomes; Survey and Data Collection Tools: Employed to gather data on healthcare professional fatigue and patient health outcomes; Literature Review Databases: Utilized for comprehensive analysis.

Details of Papers/patents: NA

Brief description of the working environment: The working environment at Le'nest, Mumbai, was excellent for learning and professional advancement. The environment was welcoming and supportive, with plenty of possibilities for group discussions and exchanges. This collaborative setting facilitated skill development and open communication between interns and professionals.

The organization expects interns to get a thorough understanding of complicated healthcare themes, including my project on health economics and professional well-being. There was a focus on applying theoretical knowledge to real-world scenarios, developing critical thinking abilities, and making meaningful contributions to current initiatives. Each individual participated in everyone's projects thereby helping and developing something meaningful.

PS-I provided important learning opportunities in two major areas for me: health economics and fatigue among healthcare professionals. Interns in Health Economics developed a thorough awareness of cost-cutting strategies and their implications for healthcare distribution. The study on Fatigue in Healthcare Professionals shed light on its causes and implications, emphasizing the importance of worker well-being in the healthcare industry.

In addition, regular presentations and conversations on a variety of topics, such as personality types, decision-making biases, and decay theory, improved the learning experience. These activities not only extended knowledge but also improved critical abilities like communication, decision-making, teamwork, and discipline.

Overall, the PS-I experience at Le'nest offered a diverse learning environment that matched academic knowledge with practical application, preparing interns for future difficulties in the healthcare business.

Academic courses relevant to the project: Health Economics

Learning Outcome: Developed expertise in analyzing healthcare cost structures, gained insights into mitigating healthcare professional fatigue, and learned to evaluate financial implications of healthcare investments and policies.

PS-I station: Manodayam Private Limited, Noida

Student

Name: SARVAGYA SURANA (2022B4A30594P)

Student Write-up:

PS-I Project Title: Application of AI in Mental Health

Short Summary of work done: During our Practice School (PS-I), we focused on the application of AI in mental health, with a particular emphasis on voice technology. Our primary tasks involved enhancing data collection techniques, applying advanced feature extraction methods, and developing user documentation for the Manodayam app. **Data Collection**: We developed standardized questionnaires to ensure consistent and high-quality data collection. We also compiled and organized extensive datasets for analysis. **Feature Extraction**: We utilized Mel-Frequency Cepstral Coefficients (MFCC) for precise voice analysis. This approach was critical in diagnosing and monitoring mental health conditions. Our AI model achieved an accuracy of 92%, indicating strong potential for real-world application. **User Documentation**: We created detailed user manuals and user flow documentation to facilitate better understanding and engagement with the Manodayam app. Through this experience, we gained hands-on expertise in AI and machine learning, particularly in feature extraction and voice analysis. We learned to handle and process large datasets, ensuring their quality and consistency. We also developed strategies to address challenges such as data standardization and algorithmic biases. Additionally, we enhanced our project management skills by coordinating various aspects of the project, from data collection to model implementation and documentation. We gained insights into the importance of user documentation and its role in the successful deployment and adoption of technological solutions. Overall, this experience provided us with valuable theoretical knowledge and practical skills in applying AI to mental health, preparing us for future contributions to digital health and AI technology.

Objectives of the project: The objective of the Practice School was to explore the application of AI in mental health, specifically focusing on the use of voice technology.

We aimed to enhance data collection methods, utilize feature extraction techniques like Mel-Frequency Cepstra.

Tool used: Python libraries-numpy, pandas, matplotlib, tensorflow, librosa

Details of Papers/patents: NA

Brief description of the working environment: During our Practice School (PS-I), we worked in a collaborative and innovative environment, focusing on AI applications in mental health. Our tasks included enhancing data collection, applying feature extraction methods like Mel-Frequency Cepstral Coefficients (MFCC), and developing user documentation for the Manodayam app.
Expectations:
The company expected us to deliver high-quality, professional work, including accurate data collection, reliable AI model development, and comprehensive user documentation.
Learning:
1. Technical Skills: Gained hands-on experience with AI and machine learning, especially in voice analysis.
2. Data Management: Improved handling and processing of large datasets.
3. Analytical Skills: Developed strategies to address data standardization and algorithmic biases.
4. Project Management: Coordinated various project aspects, enhancing organizational skills.
This experience provided us with valuable knowledge and practical skills, preparing us for future contributions in digital health and AI technology.

Academic courses relevant to the project: Artificial intelligence, data science, big data analytics.

Learning Outcome: The major learning outcomes of the Practice School were:
1. Technical Skills: Gained expertise in AI and machine learning techniques, especially in feature extraction and voice analysis.
2. Data Management: Improved ability to handle and process large, high-quality datasets.
3. Analytical Skills: Developed strategies to address data standardization and algorithmic biases.

PS-I station: MASTH (UltraHive Healthcare Private Limited), Hyderabad

Student

Name: NAUSHEEN TABASSUM (2022A5PS1247H)

Student Write-up:

PS-I Project Title: Automate Response Generation to Rfps and Questionnaires using AI

Short Summary of work done: Creating a website involves acquiring a diverse set of skills and knowledge areas. Key learning outcomes include mastering web development through HTML, CSS, and JavaScript, and utilizing frameworks like React or Angular for front-end development. Backend development skills involve server-side programming with languages such as Python or JavaScript and database management using SQL or NoSQL databases. Web design focuses on UI/UX principles and responsive design to ensure a user-friendly experience across devices. Version control, primarily through Git, is essential for managing code changes and collaboration. Deployment and hosting knowledge includes using services like AWS, managing domain names. Project management skills, including Agile methodologies and time management, are vital for overseeing the development process. Problem-solving and debugging skills are crucial for identifying and fixing issues in the code and design. Additionally, collaboration and communication are key, as working effectively with a team and maintaining clear documentation are essential for success. Overall, creating a website not only hones technical abilities but also fosters critical soft skills, making it a comprehensive learning experience valuable in any professional setting.

Objectives of the project: The primary objective of this project is to develop a website which is an AI-driven system capable of automating the generation of responses to Requests for Proposals (RFPs) and various questionnaires. This involves creating a sophisticated algorithm.

Tool used: UI/UX designing in Figma

Details of Papers/patents: NA

Brief description of the working environment: During my PS-I at Masth Ultrahive Healthcare Private Limited, I experienced a dynamic and supportive working environment. The collaborative atmosphere allowed for active engagement with mentors and team members. Daily meetings were informative, offering a platform to discuss progress, address challenges, and share insights. The mentors were approachable and flexible, providing valuable guidance and fostering an environment conducive to learning and professional growth. My expectations from the company included receiving regular and constructive feedback, opportunities for skill enhancement, a nurturing culture that encouraged questions and active participation, clear and timely communication, and access to necessary tools and resources.

Throughout the internship, I gained practical experience in UI/UX design using Figma, creating user-centric designs that were both functional and aesthetically pleasing. This involved developing skills in wireframing, prototyping, and user flows. The experience improved my teamwork and communication skills through regular interactions and daily meetings. I also learned the importance of effective time management, task prioritization, and maintaining professionalism in a corporate setting. Additionally, the internship honed my problem-solving abilities by addressing design challenges and finding innovative

solutions. Overall, the PS-I experience provided a comprehensive learning opportunity, combining technical skills in UI/UX design with essential professional and soft skills.

Academic courses relevant to the project: DBMS, AI

Learning Outcome: Creating a website involves a diverse set of skills and knowledge areas. Here are the major learning outcomes one can expect:
Web Development Skills, Backend development, Web Design, Version Control, Deployment and hosting, Problem-Solving and Debugging, Problem-Solving and Debugging.

Name: AARSH AGRAWAL (2022A7PS0234G)

Student Write-up:

PS-I Project Title: Automated response generation for RFP and questionnaires using GenAI

Short Summary of work done: Backend development in Django. Maintained database of questions and generated answers allowing crud operations and managing the required APIs.

Objectives of the project: To create a website with functionality to upload data thta you want your ai to generate answers from and generate answers for queations using this data.

Tool used: Django, python

Details of Papers/patents: None

Brief description of the working environment: 8 am meets Monday to Saturday, rest you are expected to maintain the expected work.

Academic courses relevant to the project: DBMS, AI

Learning Outcome: Django REST, Python

Name: AMOGH MALAGI (2022A7PS1113G)

Student Write-up:

PS-I Project Title: Automated Response Generation using Gen AI

Short Summary of work done: Developed a document management system in Django, implemented CRUD operations, built an automated framework to train uploaded documents on Google Gemini APIs and FAISS modules to generate responses for queries/excel questionnaires and proposals for RFPs.

Objectives of the project: Efficient document management systems, to be able to generate proposals for RFPs faster using Gen AI to increase competitiveness

Tool used: backend - Python, Django REST, Langchain. frontend(ui/ux) - Figma.

Details of Papers/patents: NA

Brief description of the working environment: WFH. Flexible work hours, around 2-3 meets (morning 8-9am) per week with company directors. Work is not too much, easily doable. Company expects you to complete assigned tasks before next meet. Learnings are good if you are a beginner in web development. Will recommend - 8/10.

Academic courses relevant to the project: Database Systems.

Learning Outcome: Web development (Django), Generative AI

Name: ARNAV BHARTI (2022B1A71585P)

Student Write-up:

PS-I Project Title: Automated Response Generation using AI

Short Summary of work done: Backend for the service was created. The service can handle multiple organisations and multiple users per organisation. All training files, input questionnaires and output files must be protected from access from non-organisation members. Each user logs in using username and password authentication. The service includes options to reset password, forgot password, and change password. It also stores the verified email ID of users. There should be different trained AI for each organisation. User can upload PDF files containing textual data that they want the AI to be trained on. User can see the list of documents that is currently stored and their training status. They can delete the documents if they so desire. User can upload an Excel file with a column of questions. The GenAI will generate responses to those questions and then users can download the questions with answers Excel file.

Objectives of the project: Companies have to fill RFPs and questionnaires. This tool helps to fill them effortlessly.

Tool used: Django Framework, Python, Django Rest Framework, Gemini, FAISS

Details of Papers/patents: NA

Brief description of the working environment: At Ultrahive Healthcare Pvt Ltd, I worked on making an AI tool that creates automatic responses. The company was modern and focused on using tech to make healthcare better.
The company wanted interns to be active, able to adapt and learn quickly. We were asked to think creatively and share ideas to make the project better.
The project was about using AI to make a system that could answer questions automatically. I learned about AI methods and how to train AI models.
I also got better at programming, especially using Python for AI. I worked with big sets of data, set up AI models, and checked how well they worked.
Overall, this internship taught me a lot. I learned theory and got to use it in a company.

Academic courses relevant to the project: Computer Programming

Learning Outcome: Creating an AI Web Service. Involves frontend, backend, design and AI.

PS-I station: MedSupervision, Faridabad

Student

Name: DEBANGSHU PATNAIK (2022A3PS1468H)

Student Write-up:

PS-I Project Title: IOT & ML for predictive maintenance in the Oil & Gas Industry.

Short Summary of work done: Read and researched articles by scouring the internet on how to integrate three sensors into one and then spent the rest of the time learning ML.

Objectives of the project: Building a hybrid sensor measuring temperature, vibration and acoustic data and use it to do predictive maintenance.

Tool used: Tensorflow, Jupyter Notebooks, NumPy, MatPlotLib were used when learning ML.

Details of Papers/patents: Nil

Brief description of the working environment: Online so no such working environment. The project being one in a new venture, expectations weren't that much from my side. Most of the time, I was expected to learn the technologies told by sir.

Academic courses relevant to the project: None

Learning Outcome: Some idea of different types of sensors and how they are integrated as a single unit. Basic Machine Learning.

Name: DAKSH JAIN (2022A7PS0201H)

Student Write-up:

PS-I Project Title: Development of AI Assisted Blockchain Enabled EMR Management System

Short Summary of work done: My primary responsibilities included integrating advanced ML algorithms and blockchain technology to create a secure, efficient, and intelligent EMR system. I began by analyzing and understanding the codebases and functionalities of Medsupervision's existing applications to effectively merge these applications into a unified app. Throughout the project, I collaborated closely with other teams, contributing to both frontend and backend development using technologies like Android Studio Koala and Node.js. A key aspect of my work involved implementing Azure Cognitive Services for OCR, which automated the classification of medical documents and significantly reduced manual data entry errors. Additionally, I developed functionalities to manage access permissions, ensuring that sensitive patient data remained encrypted and accessible only to authorized personnel, eliminating the reliance on paper prescriptions.

Objectives of the project: To develop an EMR System that enhances Medsupervision's healthcare applications and set a new standard for efficient, secure, and patient-centered healthcare. It aims to streamline patient data management, ensure secure storage, and provide quick access to the physicisn.

Tool used: Visual Studio Code, Android Studio Koala

Details of Papers/patents: NA
Brief description of the working environment: The working environment at Medsupervision during my internship was dynamic, collaborative, and innovation-driven which encouraged creativity and problem-solving. The mentors were not only experts in

their respective fields but also supportive mentors eager to share their knowledge and experiences. The company had high expectations, emphasizing the importance of delivering quality work within set deadlines. There was a strong focus on using advanced technologies to drive healthcare innovation, and I was expected to quickly adapt to new tools and methodologies. Medsupervision's commitment to excellence pushed me to continually improve my skills and stay updated with the latest industry trends. Beyond technical skills, I learned the importance of collaboration and effective communication in a multidisciplinary team. This experience was instrumental in honing my problem-solving abilities and preparing me for future challenges in the industry. Medsupervision's supportive yet challenging environment made my internship a transformative learning experience.

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

Learning Outcome: Deep understanding of integrating advanced technologies such as ML, OCR, and blockchain within healthcare systems. Hands-on experience in mobile app development and addressing challenges related to data vulnerability, system integration, and regulatory compliance, ensuring robust and scalable solutions.

Name: M HRUSHIKESH (2022AAPS0412H)

Student Write-up:

PS-I Project Title: IoT and ML for Predictive Maintenance in Oil and Gas Industry

Short Summary of work done: Basically we were aksed to research about the various types of sensors and which sensor would be a perfect fot for the hybrid sensor that we had to make. We needed to keep in mind the various specifications that were needed in those conditions. Then we had to study ML so as to implement algorithms for the same.

Objectives of the project: Building a hybrid sensor combining temperature, vibration and acoustic sensors and using ML algorithms to train the model using previous data and then using it to predict when will the equipment and machinery require maintenance.

Tool used: Visual Studio Code, Android Studio Koala
Details of Papers/patents: None

Brief description of the working environment: The working environment was quite relaxed. The mentors gave the deadlines for completing the given tasks. The project being a new venture for the company, there weren't very high expectations.

Academic courses relevant to the project: None

Learning Outcome: Researched and learned about various types of sensors. Got to know about the workings.

Name: SHREYAS SINHA (2022AAPS0799G)

Student Write-up:

PS-I Project Title: Understanding FoodBlock Research Paper and implementing future works

Short Summary of work done: Understood the research paper and Implemented modifications on the research paper

Objectives of the project: To implement improvements on a research paper

Tool used: Python, Numpy, Pytorch

Details of Papers/patents: FoodBlock

Brief description of the working environment: The working environment was quite good. The mentors gave the deadlines for completing the given tasks.

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

Learning Outcome: Python, Clustering, Codebase of a project.

Name: NISHANT GOEL (2022B1AA0882P)

Student Write-up:

PS-I Project Title: Using blockchain to store medical information

Short Summary of work done: Learned and implement blockchain

Objectives of the project: Tamper free safe medical data

Tool used: html, css, javascript, solidity, truffle, ganache, alchemy api, spolia testnet

Details of Papers/patents: None

Brief description of the working environment: Very nice and the mentors gave the deadlines for completing the given tasks.

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

Learning Outcome: Blockchain

Name: ISHIKA GOYAL (2022B3A70549P)

Student Write-up:

PS-I Project Title: Website development

Short Summary of work done: I developed various skills required for website making

Objectives of the project: Make a website for medsupervison

Tool used: Wix studio, WordPress, vscode

Details of Papers/patents: No

Brief description of the working environment: Good and the mentors gave the deadlines for completing the given tasks.

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

Learning Outcome: Web development

Name: SAAMIR AFRAAZ (2022B4A71542G)

Student Write-up:

PS-I Project Title: Enhancing Generative AI-based Creativity Using Multi-Modal Input for Better Output Generation.

Short Summary of work done: Our project was changed halfway through the internship into a research paper about a food delivery framework. We didn't do anything in the internship,the mentor allotted to us was also not very into the research paper and told us to work on the future research area of the research paper that he provided us even though none of us had any prior research experience.

Objectives of the project: This project aims to enhance generative AI models in fostering creativity across diverse modalities and structured output generation. It focuses on two key objectives: improving cross-modal generation by creating coherent content across different mediums.

Tool used: Python, matplotlib

Details of Papers/patents: FoodBlock: A secure and cost-optimal framework for online food ordering using blockchain.

Brief description of the working environment: My PS was online, do not keep your expectations high as my experience with MedSupervision was not a good one. We were allotted a research paper about gen ai to read at first and after a week or two he just randomly sent a research paper of food delivery app and told us to work on the future research part of it. After that we were told to just work on the future research part of the research paper out of the blue.

Academic courses relevant to the project: ML, Foundation of Data Science.

Learning Outcome: Web development and exposure to medical supervision.

PS-I station: MyEasyPharma - Non-Tech, Bangalore

Student

Name: SHRADHA SANJEEB MISHRA (2022A5PS1235H)

Student Write-up:

PS-I Project Title: Market Research Intern

Short Summary of work done: During my internship as a Market Research Intern at MyEasyPharma, I focused on gathering and consolidating information on preventive healthcare measures and lifestyle interventions rooted in Ayurveda, aimed at working professionals. This information was then transformed into engaging Instagram posts and videos. Additionally, I prepared collaboration ideas, pitch decks, proposals, articles, newsletters, and go-to-market strategies. I also created product standees and presentation materials for pilot grants, ensuring effective communication of the benefits of Ayurvedic practices to a broad audience, including potential partners and WhatsApp subscribers.

Objectives of the project: To collect data on Ayurvedic tips, and learn to Implement the knowledge as visual presentations for working professionals, subscribers on WhatsApp, daily readers, and Potential Partners so that statistical data, research papers and health in general can be correlated.

Tool used: EmailOctopus (for email marketing campaigns), Canva for Instagram post and other designs, LinkedIn Kendo, Normal Google docs, spreadsheet and slides.

Details of Papers/patents: NA

Brief description of the working environment: The working environment at MyEasyPharma was collaborative and supportive.
But they do expect a lot, make us work a lot sometimes. They tend to increase the workload towards the end but this is how you eventually learn to balance everything.
Making two posts daily, thinking about topics also make docs for other requirements like GTM for Ai Bot, competitive analysis etc adds to this.
Eventually they informed us about some heavy tasks like 9 page pitch deck, 5 articles etc well in advance to make the task easier for us.
They are very professional and trust us with their Instagram handle and LinkedIn posts which was very crucial to keep us motivated and learn more.

Academic courses relevant to the project: Being a pharma student helped me correlate Ayurveda with modern medicine. But anyone can apply for market research in general.
Learning Canva helps.

Learning Outcome: Collect information regarding preventive healthcare measures and lifestyle interventions for working professionals based on Ayurveda.
Consolidating this information into Instagram posts and videos.
Preparing collaboration ideas, pitch decks, proposals, articles, newsletters, go-to-market strategies, and competitive analysis in the market.
Creating product standees and PPTs or materials for pilot grants.

Name: MD SADIQUE (2022A7PS0156P)

Student Write-up:

PS-I Project Title: Market Analysis Research

Short Summary of work done: During my tenure at MyEasyPharma, I contributed to several key areas: Market Analysis: Conducted a competitive analysis on AYUSH-related startups, identifying industry trends and positioning opportunities for MyEasyPharma. Content Development: Created and updated content for the website, including articles, blogs, FAQs, and the About Us section to enhance user engagement and SEO. Chatbot Development: Researched relevant scholarly articles to inform the AI chatbot's responses and reached out to potential collaborators for enhancing the chatbot's functionality. Strategic Pitches: Developed and presented pitches for various initiatives, including collaborations, funding opportunities, and partnerships with organizations like the Wadhwani Foundation and AYUSH Healers. Reach Improvement: Implemented a content strategy for Instagram and newsletters via EmailOctopus, resulting in increased audience engagement and brand visibility. Overall, my work focused on enhancing MyEasyPharma's market presence, improving digital content, and contributing to strategic initiatives.

Objectives of the project: Assess MyEasyPharma's Market Position: Analyze the company's current standing in the preventive healthcare market, including its strengths, weaknesses, opportunities, and threats. Evaluate Content Strategy Impact: Review the effectiveness of Instagram.

Tool used: Canva, EmailOctopus, GoogleDocs, GoogleSheets, GoogleSlides

Details of Papers/patents: NA

Brief description of the working environment: It was fully online. Aside from the working timings already mentioned, we were allowed upto one hour of break for lunch and timings were fairly flexible, as long as the deadlines were met. Sometimes the quantity of work assigned was a bit overwhelming though.

Academic courses relevant to the project: Database Systems, CP

Learning Outcome: Market Analysis, Business Analysis, Content Creation.

Name: SHOUNAK KULKARNI (2022A7PS1151G)

Student Write-up:

PS-I Project Title: Backend Development for MyEasyPharma

Short Summary of work done: During my two-month internship at MyEasyPharma, I contributed to both design and development aspects of a mobile app project. I started by creating wireframes using Figma, then shifted to backend development with NestJS. Initially, we used PostgreSQL with Prisma for database management, but later migrated to MongoDB with Mongoose. In the end we helped the frontend team integrate the backend APIs with the app and the website. This experience enhanced my skills in full-stack development, exposed me to different database solutions, and improved my ability to work in a cross-functional team environment.

Objectives of the project: Developing the frontend and backend for the website and app for the copmany.

Tool used: NestJs, PostgreSQL, PrismaORM, MongoDB, Mongoose.

Details of Papers/patents: No paper/patents involved

Brief description of the working environment: The work environment was positive, providing all necessary resources to learn the required technical stack. Guidance was readily available when needed. This experience enhanced my understanding of the development process, exposed me to various technologies, and improved my UI design skills. Most importantly, it strengthened my communication abilities. Through this opportunity, I gained valuable insights into the practical aspects of software development and teamwork in a professional setting.

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

Learning Outcome: I learned a lot about backend development and different tech stacks. Secondly, I learned about the importance of communication between the teams for the best efficiency.

PS-I station: Mylab Discovery Solutions - Tech, Jaipur

Student

Name: DHRUV GUPTA (2022A3PS1215P)

Student Write-up:

PS-I Project Title: Backend

Short Summary of work done: Mostly most of the time was free... the incharge forgot us after meet..andt last week when we asked for some work then only he allotted some.

Objectives of the project: To add some feature to company's website

Tool used: Mongoose, Vs code

Details of Papers/patents: No

Brief description of the working environment: Was remote but it was really very good.

Academic courses relevant to the project: Database Systems, CP.

Learning Outcome: node.js, express.js, mongoDB etc

PS-I station: Pacify Medical Technology Private Limited, Mumbai

Student

Name: PRANAY SANDEEP JALAN (2022A8PS1719P)

Student Write-up:

PS-I Project Title: Development of Wound-Area Estimator

Short Summary of work done: Made the user interface of an application that takes images from the users and outputs the area of the wound in that image. Integrated a mask-can model to the front end via flask.

Objectives of the project: To develop a user interface for a wound area estimator.

Tool used: React, Python, Flask, VS Code, GitHub

Details of Papers/patents: No

Brief description of the working environment: The working environment was not that good. I learned most of the things on my own. There were no expectations from the company. Learned full-stack web development.

Academic courses relevant to the project: CP

Learning Outcome: Integration of machine learning model with React web applications. Deployment to cloud services.

PS-I station: Paryatan School of Innovative Education - Tech, Hisar

Student

Name: DHRUBA CHATTERJEE (2022A3PS0899G)

Student Write-up:

PS-I Project Title: Website development for the Paryatan Foundation

Short Summary of work done: First we developed a basic roadmap of what tasks were needed to be performed for the website to be developed in the duration of our project. Next we researched various designs of websites of other big NGOs to decide what style and components would suite the project. Finally the prepared design was implemented using Next.js, tailwind CSS and Node.js with deployment planned on vercel.

Objectives of the project: Developing a responsive website

Tool used: Javascript, HTML, CSS, Next.js, Node.js

Details of Papers/patents: NIL

Brief description of the working environment: The working environment was laid back and the company expected only weekly updates. We learned basic web development and how to use the relevant tools.

Academic courses relevant to the project: Computer programming (CP)

Learning Outcome: Web development basics.

PS-I station: Yashoda Hospitals, Hyderabad

Student

Name: CHERYL CHAUDHARI (2022A4PS1463G)

Student Write-up:

PS-I Project Title: Creating an Online Calculator Capable of Diagnosing Fatty Liver Disease

Short Summary of work done: This project involved developing a sophisticated full-stack web application for predicting fatty liver disease. The frontend was built using ReactJS, leveraging its component-based architecture, virtual DOM, and unidirectional data flow to create a dynamic, responsive, and user-friendly interface accessible via localhost:3000. The backend, powered by Python, managed complex computations and machine learning model inference, ensuring accurate and reliable predictions. Seamless integration between the frontend and backend was achieved through RESTful APIs, facilitating efficient data exchange. We emphasized security by implementing secure authentication methods like JWT, data encryption via HTTPS, and input validation to prevent vulnerabilities such as SQL injection and XSS attacks.

Objectives of the project: This project aims to significantly benefit healthcare providers and individuals in Tier 2 and Tier 3 cities by providing accessible, accurate predictive analytics for fatty liver disease. By equipping local doctors with advanced diagnostic tools, the web based app need to be developed.
Tool used: ReactJS, Python, RESTful APIs, HTTPS Protocol, HTML, CSS, JavaScript, Machine Learning Libraries (Python).

Details of Papers/patents: NA

Brief description of the working environment: The doctors guide you in what they want in the project. Most of the work is to be learned and done by students. The project is mostly online, even if it is mentioned as an Onsite station.

Academic courses relevant to the project: NA

Learning Outcome: Through this project, we gained invaluable insights into modern web development and machine learning integration. We mastered ReactJS for creating dynamic, scalable frontends and utilized Python for robust backend processing. Our experience included developing secure authentication protocols, ensuring seamless data flow, and implementing real-time data visualization, ultimately enhancing our ability to build user-centric, data-driven applications.

Name: B.VAISHNAVI (2022A7PS1357H)

Student Write-up:

PS-I Project Title: Create a faster and effective way for Poct device

Short Summary of work done: Create a chat or that can tell accurately than ChatGPT when the symptoms are the inputs.

Objectives of the project: Review the current poct device and make a chatbot.

Tool used: AI

Details of Papers/patents: Reports were made every week about the work

Brief description of the working environment: Good working environment but the faculty in charge was not convinced with the amount of work we do, lied to our faces and spoke disrespectfully to the girls regarding cg when we went to ask about the marks.

Academic courses relevant to the project: C, C+

Learning Outcome: Tech related such as modern web development and machine learning integration.

Name: KARTHIKEYA KOMARRAJU (2022AAPS0438H)

Student Write-up:

PS-I Project Title: Web development

Short Summary of work done: So I have learned how to develop a web using python and java

Objectives of the project: Developing a website page using python

Tool used: Xaamp

Details of Papers/patents: No

Brief description of the working environment: Yeah, it's pretty good, the staff there are supported very much.

Academic courses relevant to the project: MI

Learning Outcome: Fatty liver detection

Name: HELI RAVINDRA PALISETTI (2022B1AB0991P)

Student Write-up:

PS-I Project Title: Creating a faster and active Diagnostic System

Short Summary of work done: During my PS-I at Yashoda Hospitals, I was part of a project aimed at enhancing the diagnostic and treatment system for snakebite cases. The project involved creating an AI-powered chatbot designed to provide quick and accurate information about venomous snakes in India. My role included researching various venomous snakes, understanding the symptoms, pointing major factors affecting human body after the snakebites and treatment protocols. The chatbot was designed to assist healthcare professionals in identifying the snake based on patient symptoms and providing the corresponding treatment guidelines. We used machine learning algorithms to train the chatbot, enabling it to improve its responses over time. The project also involved testing and refining the chatbot to ensure its accuracy and usability in a real-world clinical setting. This system is expected to significantly reduce the time taken to diagnose and treat snakebite cases, thereby improving patient outcomes.

Objectives of the project: Develop a faster and more active diagnostic system to improve snakebite treatment at Yashoda Hospitals. Create an AI chatbot that provides accurate information about venomous snakes in India, including identification and appropriate treatment protocols.

Tool used: Chatbot Development Frameworks, API interface and High-performance computing systems for training machine learning models.

Details of Papers/patents: None

Brief description of the working environment: The working environment at Yashoda Hospitals was both challenging and enriching. The project demanded a high level of technical expertise and the ability to apply AI in a critical healthcare setting. The hospital provided access to essential resources and expert guidance, which greatly facilitated our learning and development process. The expectations from the company were clear: deliver a reliable and efficient diagnostic tool that could be seamlessly integrated into the

hospital's existing systems. Throughout the project, I learned to navigate the complexities of working in a healthcare environment, including understanding the critical nature of the work and the importance of accuracy and reliability in our AI solutions. The experience taught me the importance of teamwork, as collaboration with medical professionals and other technical teams was crucial for the success of the project. Overall, the PS-I experience was invaluable, offering a unique opportunity to apply AI skills in a real-world scenario and contribute to a project with the potential to save lives.

Academic courses relevant to the project: probability and statistics, digital signal processing.

Learning Outcome: Acquired an understanding of venomous snakes in India, their identification, and treatment methods.
Learned to integrate AI tools with medical data to provide actionable insights for improving patient care.
Developed skills in collaboration, problem-solving, and project management in a professional healthcare setting.

Name: YUVAN KOVVURI (2021AAPS2764G)

Student Write-up:

PS-I Project Title: The effect of continuous and discrete infusion of nor adrenaline on SSEP and MEP readings of intraoperative neuro-physical monitoring.

Short Summary of work done: We basically conducted research on how INOP works , the diffrent methods used under it to help monitor patient nerve health during surgeries to help improve safety of surgeries. We also researched the negative effect of anesthesia on the SEP and MEP readings causing the latency and amplitude of signals to fluctuate. We researched the effects of nor adrenaline on helping increse blood pressure to counteract the effects of anesthesia. We actually saw a live surgery and saw the monitoring they do and we studied how to analyse the data using linear transfomations , correlations , filtering . We also used statistics and graphical analysis on matlab to understand the best use of the infusion schemes of nor adrenaline(contiuous and discrete) and created a report as such to present to the professor and the doctor in charge.

Objectives of the project: 1) To understand how INOP effects surgeries by helping in identifying risk.2)To understand how anaesthesia effects INOP readings 3) to understand how we can use nor-adrenaline to counter fluctuations in SSEP and MEP data.

Tool used: Matlab, chatgpt, excel, word, google meet, academica (for papers).

Details of Papers/patents: None

Brief description of the working environment: We would meet the doctor and our prof in conference halls in the hospital where we would discuss topics related to the project and conduct group discussions on topics of the medical engineering field . The doctor hoped that we could analyze patient data to find the best methods of identifying which infusion scheme of nor adrenaline could be used on a patient undergoing surgery to help the surgeons increase the safety standards.

Academic courses relevant to the project: Probability and statistics, digital signal processing, basic computer knowledge.

Learning Outcome: It helped me understand the challenges doctors face, and how they team up with engineers to make methods like INOP to reduce risk and make surgeries safer.

Name: SRUTI DARSHINI NETI (2021B1A33212H)

Student Write-up:

PS-I Project Title: Disease prediction

Short Summary of work done: I extracted a data set from the internet and developed a few ML models.

Objectives of the project: Kidney disease prediction using ML

Tool used: S/w

Details of Papers/patents: None

Brief description of the working environment: It was mentioned that it is an onsite station, but we didn't feel so. We were only called to the PS station 4 times, that too for evaluation purposes.

Academic courses relevant to the project: ML.

Learning Outcome: Hands on experience on ML.

Name: SREE KIRTHHANNA NARREDDI PEDDA VEMANNA GARI (2022A1PS1395H)

Student Write-up:

PS-I Project Title: Equipment booking and co-ordination.

Short Summary of work done: Creating a website or portal which is useful for hospital and managing the work.

Objectives of the project: To Create a login portal for equipment booking

Tool used: S/w

Details of Papers/patents: NA

Brief description of the working environment: As usual company expects a quality and useful work for them.

Academic courses relevant to the project: CS F111 (CP).

Learning Outcome: Observing and managing the systems for hospital branches.

Name: BODAPUDI UDAY SHANKAR (2022A3PS0655H)

Student Write-up:

PS-I Project Title: Neurophysiological monitoring

Short Summary of work done: Researched on the topic and collected data from hospital/mentor regarding the same and then used statistical approach to find the results.

Objectives of the project: To find better method to infuse noradrenaline to control BP during a surgery.

Tool used: Microsoft Excel, ANOVA, Statistical tools.

Details of Papers/patents: NA

Brief description of the working environment: Good, prior receiving of required data would have been really good. Experience is good with the doctors.

Academic courses relevant to the project: Probability and statistics

Learning Outcome: Statistics, hospital environment experience.

Name: U V YASHOVARDHAN REDDY (2022A3PS0721H)

Student Write-up:

PS-I Project Title: Effect of Low-Dose Noradrenaline infusion on SSEP and MEP monitoring: A Randomized controlled trial

Short Summary of work done: The main idea behind this project is of Intraoperative Neurophysiological monitoring. It was divided into three parts of research: SSEP(Somatosensory Evoked Potential) monitoring, MEP(Motor Evoked Potential) monitoring and Blood Pressure monitoring. SSEP and MEP are crucial parameters in a surgical procedure where anesthesia is being administered. The use of these tests enable to check the neural coordination of a patient during surgery. But many times, when anesthesia is administered, there might be a change in the blood pressure of the patient and hence, cause a hindrance in the neuromonitoring recording. The main goal of this project was to check for an optimal dosage or level for which the parameters can be efficient. The measurement of these are done through a graph which has intervals of voltage and time. The two main features of these graphs are latency and amplitude. Vasoconstrictors like Noradrenaline play a crucial role in stabilizing the vital signs effected by the inducing of anesthetic agents. Additionally, it was also seen that anesthesia causes considerable fluctuations in heart rate and BP. SSEP an MEP responses were measured and analyzed for trends and effects of anesthetic agents. Further studies are also needed to explore the long term effects of IONM techniques and their application in diverse surgical settings.

Objectives of the project: This project aims to compare the effect of Vasoconstrictors and Anesthesia on patients undergoing surgery and how infusions of vasoconstrictors like noradrenaline influence patient monitor data. By employing statistical tools, we generate comparisons of effect of Vasoconstrictors and Anesthesia on patients.

Tool used: Microsoft Excel, ANOVA, Statistical tools

Details of Papers/patents: None

Brief description of the working environment: We had a great experience in our workplace. Though most of our work happened in an online mode, the interaction between the students, faculty and mentors had a great effect on our learning. Witnessing

live surgical procedures related to the project made learning easier. Our faculty in-charge was always available when we needed his support in any matter related to the project or of the evaluation components. The most important aspects of this internship were teamwork and communication skills, it enabled us to be prepared for our future jobs.

Academic courses relevant to the project: General Biology, Computer programming

Learning Outcome: We learnt about the major functioning tests involved in Neurosurgery and their importance in a patient's life. It enabled us to understand how these parameters change when subjected to certain medications and how they can be further improved to get more optimal solutions.

Name: OJAS YADAO NIMAJE (2022A5PS1454P)

Student Write-up:

PS-I Project Title: Using Machine Learning to Improve Prediction of Chronic Kidney Disease (CKD).

Short Summary of work done: During my PS-I at Yashoda Hospital, Hyderabad, I worked on a project to help predict Chronic Kidney Disease (CKD) using machine learning. My job was to collect and prepare medical data, clean it up, and figure out which health factors were most important in predicting CKD. I worked with different machine learning methods, like decision trees and random forests, to find the best way to predict CKD. I also focused on improving the models by adjusting settings to make them more accurate. The goal of the project was to create a tool that could help doctors catch CKD early and give patients personalized advice. Through this work, I learned how to handle healthcare data and use machine learning to solve real-world problems.

Objectives of the project: 1. Early Detection 2. Improved Accuracy 3. Key Factor Identification 4. Minimize Errors 5. Personalized Risk Assessment.

Tool used: Development Tools Used: Software (S/w): Python (for data analysis and machine learning) Jupyter Notebook (for coding and visualization) Pandas, NumPy (for data preprocessing) Scikit-learn (for machine learning models) Matplotlib, Seaborn (for data verification).

Details of Papers/patents: As of now, no papers or patents have been published from my work during the PS-I at Yashoda Hospital on the prediction of Chronic Kidney Disease (CKD) using machine learning. However, the findings and insights from this project have potential for future research.

Brief description of the working environment: During my PS-I at Yashoda Hospital, I experienced a collaborative and dynamic working environment that emphasized teamwork and innovation. The hospital provided a supportive atmosphere, where professionals from various fields, including data science and healthcare, worked together to tackle real-world challenges. I was encouraged to engage with colleagues, share ideas, and participate in discussions that enhanced my understanding of healthcare data analytics.

My expectations from the company included gaining practical experience in data analysis and machine learning, as well as exposure to the healthcare domain. I aimed to contribute meaningfully to the project while learning from experienced professionals.

Throughout my internship, I gained valuable insights into the application of machine learning techniques in healthcare. I learned how to preprocess data effectively, select relevant features, and implement various machine learning algorithms. The hands-on experience with real clinical data improved my technical skills and deepened my understanding of Chronic Kidney Disease.

Additionally, I developed soft skills such as communication, teamwork, and problem-solving, which are essential in a collaborative environment. Overall, my PS-I at Yashoda Hospital not only strengthened my data science skills but also reinforced my commitment to improving patient care through technology and innovation.

Academic courses relevant to the project: Computer Programming, Anatomy Physiology and Hygiene, General Biology.

Learning Outcome: 1. Advanced Machine Learning Techniques 2. CKD Risk Prediction 3. Data Preprocessing & Feature Engineering 4. Model Evaluation & Optimization 5. Healthcare Data Interpretation

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Name: TRISHA SESHADRI IYER (2022A8PS2028H)

Student Write-up:

PS-I Project Title: Kidney disease

Short Summary of work done: I experienced a collaborative and dynamic working environment that emphasized teamwork and innovation in the area of ML project work.

Objectives of the project: To predict the kidney disease

Tool used: Python

Details of Papers/patents: None

Brief description of the working environment: Very chill and Working with such an ambitious and talented group was a rewarding experience that provided me with valuable insights and practical knowledge in the healthcare innovation and technology integration.

Academic courses relevant to the project: Computer Programming, ML, General Biology.

Learning Outcome: ML techniques, CKD Risk Prediction, Data Preprocessing & Feature Engineering.

Name: RAKSHA SUMAN RAGHURAM (2022ABPS1019P)

Student Write-up:

PS-I Project Title: Developing a 5G Ambulance

Short Summary of work done: I worked with a team of five to develop Hyderabad's first 5G ambulance. We began by researching existing 5G ambulances and listing all necessary components. Our goal was to establish a reliable connection between the ambulance and the hospital, which, despite being a renowned brand in Hyderabad, lacked this crucial feature. To address this, we created a website linked to a digital spreadsheet to record patient details, replacing the outdated manual system. The website also integrates GPS tracking and is connected to a tablet installed in the ambulance. This setup allows for real-time video calls with doctors, enhancing patient care as the ambulance staff consists only of technicians.

Objectives of the project: To develop a 5G ambulance to facilitate emergency medicine and reduce time in the emergency room.

Tool used: Python, Google workspace and then components to install in the ambulance.

Details of Papers/patents: Budget to be approved by the hospital in the forthcoming week- the project is continuing beyond PS-1.

Brief description of the working environment: During my PS-I, I worked in a dynamic and collaborative environment with an active, interested, and talented team of five. Our project was to develop Hyderabad's first 5G ambulance. We were fortunate to work with a supportive doctor who was thrilled to have us on board and provided a list of features he had seen in other hospitals that he wished to implement. He gave us full access to any information we needed, including his personal cell number, and connected us with the hospital manager and technicians. Our goal was to create a seamless connection between the ambulance and the hospital, which lacked this crucial feature. We built a website linked to a digital spreadsheet to record patient details, replacing the outdated manual system. The website also integrated GPS tracking and connected to a tablet in

the ambulance for real-time video calls with doctors, enhancing patient care as the ambulance staff consisted only of technicians. The company expected us to deliver a functional 5G ambulance system, improve emergency response times, and enhance patient care through advanced technology. Through this experience, I developed skills in integrating 5G technology with medical services, learned to innovate within the healthcare sector, improved my problem-solving abilities, and enhanced my teamwork and communication skills. Working with such an ambitious and talented group was a rewarding experience that provided me with valuable insights and practical knowledge in healthcare innovation and technology integration.

Academic courses relevant to the project: ML, Python

Learning Outcome: 1. Technological Integration 2. Problem Solving 3. Healthcare Innovation 4. Collaboration and Communication.

Name: I.KARTIKEYA (2022B3A40751H)

Student Write-up:

PS-I Project Title: Normality/abnormality detection in kidney

Short Summary of work done: I have worked on developing and enhancing our model to detect the abnormalities in the kidney . It was a good experience as I think I have learnt many things from it.

Objectives of the project: To detect abnormalities in the kidney

Tool used: Python

Details of Papers/patents: None

Brief description of the working environment: It was a very stress free environment and I think the feedback loop was not that good as the mentors of yashoda were not in constant touch with us while we were developing the model.
Academic courses relevant to the project: Python

Learning Outcome: ML ALGORITHMS

Name: PRASHANTH SWAMINATHAN (2022B4A80968H)

Student Write-up:

PS-I Project Title: Effects of Low-Dose Noradrenaline Infusion on Neuromonitoring Data: A Randomized Control Trial.

Short Summary of work done: The Project Mainly focused on applying Statistical tools to compare population samples and ther distributions. We Generated Patient expected trends and data and then compared with real world samples to accurately judge the surgery condition of the patient. The use of the project aims at accurate diagnosis and understanding the use of infusion of Noradrenaline towards patient safety.

Objectives of the project: To accurately sort and Infer the positive effects of Continuous infusion of vasoconstrictors on neuromonitors.

Tool used: MATLAB, Microsoft Excel, Desmos Graphing Calculator, Wolfram Alpha, Statistical Models.

Details of Papers/patents: NA

Brief description of the working environment: There was a very good work environment established at Yashoda. As all the doctors already were familiar with the concept of PS they were able to accurately guide us for the work and give us valuable feedback along with Industry exposure introducing us to the world of healthcare and diagnosis.

Academic courses relevant to the project: Probability and Statistics, Statistical Inference and Application.

Learning Outcome: A strong Learning on the Procedure or Neuromonitoring and Applied Statistical Inference on Populations.

PRACTICE SCHOOL MILESTONES:

- Conceptualization – 1973

- Extended PS option to all disciplines – 1975

- Inception of PS-I - 1976

- COPSIMS (Computer Operated Practice School Instruction Monitoring System) – 1985

- First PS station abroad – 1991

- PS for Higher Degree – 1992

- Double semester PS for Dual Degree students – 1992

- Combined PS-I operation for Pilani and Goa campuses – 2006

- Combined PS-II operation for Pilani and Goa campuses – 2007

- WEPSIMS (Web Enabled Practice School Instruction Monitoring System) – 2008

- Combined PS-I operation for Pilani, Goa and Hyderabad campuses – 2010

- Combined PS-II operation for Pilani, Goa and Hyderabad campuses – 2011

- BITS Pilani started offering scholarship of Rs. 8,000/- per month amounting to Rs. 44,000 (for the entire duration of PS-II) to selected PS-II students with CGPA 7.00 and above at various research organizations to encourage students to opt for CSIR & other Govt. Research labs - 2012

- PSMS (Practice School Management System) – 2014

- Conceptualization of PS Chronicles - 2015

- Digital Content for Skill gap - 2016

- Enhanced scholarship amount for PS-II students (CGPA 7.00 & above) at CSIR & other Research labs - Rs, 12,000 per month amounting to Rs. 66,000 (for the entire duration of PS-II) - 2016

- Introduction of Subject Matter Expert (SME) for PS-I Projects - 2017

- Digital version of PS Diary - 2019

- Successful implementation of PS-I course in remote mode for 2940 + students during summer 2020 with detailed project identification prior to start of the course - 2020

- Establishment of Student Counselling Cell (SCC) – 2023

- Conceptualization of open house much prior to allotment process - 2023

- Initiated Level of Engagement (LoE) survey for PS-I students during the course – 2023

- Pre PS-II Preferences Survey - 2023

- Conceptualized the live support sessions for students opting for PS – 2023

- BITS Pilani is currently offering an enhanced scholarship of Rs. 20,000 per month amounting to Rs. 1,10,000/- (for the entire duration of PS-II) to selected PS-II students with CGPA 6.00 and above at various research organizations - 2023.

- Complete restructuring of PS transcript - 2023

- Conceptualization of data source page for providing the access to information in a single platform for students - 2024

- Implementation of New Practice School Management System with enhanced capabilities for planning & allotment purposes - 2024.

- Conceptualization of Pre Practice School-I survey – 2024

Practice School Division
PS Chronicles

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