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CIVIL ENGG. TRANSPORTATION ENGG. (M.Tech Dual5Y)
MINOR in COMPUTER SCIENCE & ENGG. (B.Tech 4Y)
MICRO SPL. in ARTIFICIAL INTELLIGENCE AND APPLICATIONS

EDUCATION

Year	Degree/Exam	Institute	CGPA/Marks
2025	M.TECH Dual Degree 5Y	IIT Kharagpur	8.13 / 10
2020	All India Senior School Certificate Examination	D.A.V. International School, Kharghar	96.6%
2018	All India Secondary School Examination	D.A.V. International School, Kharghar	95.6%

INTERNSHIPS

Research Intern | Stanford University| Prof. Pascal Geldsetzer **May 2023 - August 2023**
Objective: *Automated machine learning for geotagged data to predict Maternal and Child Health (MCH) indicators*
- Surpassed the results (MCRMSE) by **>50%** increment in confidence score compared to previous research papers based on the same dataset
- Enhanced feature selection by **98%** and accelerated performance by using **Random Forest Regressor** and **Principal Component Analysis**
- Forecasted MCH indicators with a mean column RMSE of **11.81** via implementation of **MLP** algorithm with **LSTM** in low income countries

Research Intern | IIM Ahmedabad | Prof. Indranil Bose **June 2022 - September 2022**
Objective: *To analyse the sentiment of various apps in the Play Store and gain insights into users' attitudes and emotions*
- Developed Python script using **Beautiful Soup** to extract various features like app description, reviews, recent changes etc. of **10000 Apps**
- Built **LDA model** for insightful topic analysis, optimising hyperparameters to achieve an impressive coherence score of **0.61**
- Utilised **VADER** to accurately determine the sentiment polarity of the dataset, providing valuable insights with its **compound score**

Business Analyst Intern | Indian School of Business, Hyderabad | Prof. Prasanna Tantri **June 2022 - August 2022**
Objective: *To formulate &test the CAPM andFama French Model on Tata Motors' daily returns*
- Formulated the **CAPM,**3 &4 factors **Fama French** Model on the daily returns of the firm Tata Motors from 1996-2019 (**5901** data points)
- Computed the data values for **momentum**, **size**, **value factors**and **market risk premium** and used them as the independent variables
- Tested for the validity of assumptions in the models by performing the tests:- **Breusch-Pagan LM**, **Breusch-Godfrey**and **VIF** using Stata

PROJECTS

Autonomous Vehicle Security | Prof. Soumyajit Dey | Master's Thesis **August 2024 - May 2025**
Objective: *Develop an AI-based anomaly detection system to enhance security and reliability in autonomous driving systems*
- Implemented a **multi-sensor fusion** pipeline integrating data from various sensors using CarMaker's Video Box and Jetson Orin
- Designed diverse **attack scenarios** to test vulnerabilities, focusing on protocol and communication in **perception-based control systems**
- Developed mitigation strategies using **GPU** based perception pipelines and rejected **false data injections**, enhancing system robustness

ESCOIN: Efficient inferencing for GPUs | Prof. Soumyajit Dey **February 2022 - April 2022**
Objective: *To improve computational efficiency by optimising data reuse and mitigating sparsity impact on GPU operations*
- Developed sequential implementation of sparsified convolutions for 6x6 input feature maps, robustly improving the performance of **CNNs**
- Effectively applied 3x3 **sparse convolution** filters to the input feature maps, resulting in significantly enhanced efficiency of the CNN
- Accomplished a notable **1.6x** speedup over CUBLAS on various GPUs after meticulously optimising the AlexNet CNN inference pipeline

Many Body Problem | Prof. Pralay Mitra **February 2022 - March 2022**
Objective: *Develop a parallelized simulation system using OpenMP to analyze and present the trajectory of 1,000 balls*
- Developed a parallelized **OpenMP C++** implementation, to simulate simultaneous collisions of **1000 balls** in a specified 3D cuboidal space
- Engineered a robust 3D visualizer in **Python** using **MayaVI** that showed the positionof the particles after collisions over **720,000 iterations**
- Achieved a remarkable **350%** improvement by leveraging **OMP directives**, accelerating simulation speed from **8.4 hours** to **2.4 hours**

COMPETITION/CONFERENCE

KPIT Sparkle | Connected Vehicles Simulation Tool | National Finalist **October 2022 - March 2023**
- Distinguished over **1300+**competing teams from across India, securing a coveted position as one of the top **24 national finalists**
- Created a customizable platoon **simulation tool** to assess control schemes' efficacy in enhancing attack resilience for connected vehicles
- Utilised **Omnet++** (network simulator) for implementation of V2X communication into implement platoon management protocols
- Integrated **SUMO** (intermodal traffic simulator) with framework of **Omnet++** unlocking the ability to simulate diverse real time scenarios

SKILLS AND EXPERTISE

Programming and Scripting Languages: C | C++ | Python | HTML | CSS | JavaScript | SQL | MATLAB | CUDA
Tools and Libraries: NumPy | Pandas | Matplotlib | Seaborn | Scikit-Learn | OpenMP | CarMaker | CARLA | OpenCV | Tensorflow | PyTorch | NLTK | Hugging Face Transformers | LangChain | YOLO | Apache Spark | Git | MySQL | AutoCAD | AWS

COURSEWORK INFORMATION

Programming and Data Structures | Linear Algebra and Complex Analysis | Advanced Calculus | Probability and Statistics | High Performance Parallel Programming | Cyber Physical Systems | Machine Learning and Applications | Graphical and Generative Models | Computer Architecture and Operating System | Image Processing | Visual Perception and Motion Planning for Self-Driving Cars | State Estimation and Localisation for Self-Driving Cars | Remote Sensing, GIS, and Image Processing in Infrastructure Management

AWARDS AND ACHIEVEMENTS

- Awarded **Chanakya Fellowship 2024** by AI4CPS, recognizing excellence in artificial intelligence and cyber-physical systems research
- Achieved **4th** rank in Maharashtra and Goa zone and **12th** International Rank in SOF International Mathematics Olympiad
- Accomplished **17th** rank in the Maharashtra and Goa zone during the SOF International Science Olympiad
- Qualified for **State Level Camp** (level - III) in Vidyarthi Vigyan Manthan (VVM), one of the most prestigious science talent search programs
- Secured **3rd** place in the highly competitive DSO **District Level** (U-19) chess tournament &qualified for the esteemed **State Championship**

!Self declared by the student, CDC could not verify the relevant documents