Rathour Param Jitendrakumar | **190070049**
Electrical Engineering | **Dual Degree (B.Tech. + M.Tech.)**
Indian Institute of Technology Bombay | **Gender: Male**
Specialization: Control and Computing | **DOB: 07/10/2001**

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2023	8.87

Pursuing a **Minor** in **Computer Science & Engineering**

Scholastic Achievements

- Achieved a perfect **10 SPI** (Semester Performance Index) with 36 credits during the 8th semester at IIT Bombay *(2023)*
- Secured **All India Rank 926** in Joint Entrance Examination (**JEE**) **Advanced** among 161 thousand candidates *(2019)*
- Secured **99.9%** percentile in Joint Entrance Examination (**JEE**) **Main** among 1.1 million candidates *(2019)*
- Recipient of the National Talent Search (**NTS**) Scholarship received by the top 1000 students in the country *(2017)*

Work Experience

NVIDIA | ASIC Intern | GPU Subsystem *(May 2022 - Jul 2022)*

Guide: Raghuram L

- Worked on enhancing the NVLink interconnect performance model to incorporate multiple pipes per High-Speed Hub
- Integrated a 1-D arbiter class template to the NVLink performance model while thoroughly maintaining its functionality

Key Projects

Intelligent and Learning Agents *(Jul 2021 - Nov 2021)*

Guide: Prof. Shivaram Kalyanakrishnan *(CS747 | Foundations of Intelligent and Learning Agents | Course Project)*

- Implemented and compared ε-greedy, **UCB**, KL-UCB and Thompson Sampling for a stochastic multi-armed bandit framework
- Performed **MDP Planning** using Value Iteration, Howard's Policy Iteration and Linear Programming with **PuLP** in Python
- Propelled up a car placed at the bottom of a sinusoidal valley using **Sarsa** with **Tile Coding** in the **OpenAI** Gym environment

Autonomous Robotic Systems and Control *(Jan 2023 - May 2023)*

Guide: Prof. Debasattam Pal *(EE615 | Control and Computing Lab | Course Project)*

- Realised **path planning** and **obstacle avoidance** of autonomous mobile robots in **MATLAB** using Vector Field Histogram
- Executed **sensor fusion** using complementary & **Kalman filter** for estimating the orientation of inertial measurement units
- Implemented stabilisation of Rotary Inverted Pendulum using Swing-Up Control and **Linear-Quadratic Regulator** Control

Coded Computing for Straggler Mitigation, Security and Privacy *(Sep 2021 - Nov 2021)*

Guide: Prof. Nikhil Karamchandani *(EE605 | Error Correcting Codes | Course Project)*

- Investigated polynomial coding and Lagrange Coded Computing (LCC) techniques to mitigate fundamental bottlenecks in Large-Scale Distributed Computing for computing matrix multiplications and evaluating arbitrary multivariate polynomials
- Explored applications of LCC in secure & private **Multi-Party Computing** (MPC) and **privacy-preserving** machine learning

Distributed Deep Learning *(Mar 2020 - Jul 2020)*

Institute Technical Summer Project (ITSP) *(Institute Technical Council, IIT Bombay)*

- Developed a Hierarchically-Distributed Deep CNN learning model for training **super-high-resolution datasets** via spatial segmentation of each sample and observed an increase in **training speed** and a decrease in **memory utilisation** per node
- Verified the approach by using Kaggle's **Retinal OCT** dataset and analysed loss of information due to spatial segmentation

Dining Philosophers: A Synchronisation Problem *(Jan 2022 - May 2022)*

Guide: Prof. Mythili Vutukuru *(CS347 | Operating Systems | Course Project)*

- Modelled the threads by creating custom semaphores using condition variables and mutex abstractions of **pthreads** API
- Devised and implemented two solutions by using **semaphores** and **condition variables** each and proved their correctness

Positions of Responsibility

Teaching Assistant | Computer Programming and Utilisation *(Autumn 2020, Autumn 2021, Spring 2022, Autumn 2022)*

- Academically guided **50** students, personally cleared their doubts, prepared and evaluated examinations & lab problems
- Brainstormed **60+ practice problems** for CS101, shared via a personal **webpage** with tips and resources to boost interest

IIT Bombay Racing | Junior Design Engineer | Electrical Subsystem *(Sep 2020 - May 2021)*

- Simulated the LV Safety board on **LTSpice** and verified the working of RTDS, brake light, and error blocks of the subsystem
- Explored Electromagnetic Interference (**EMI**) reduction techniques to be incorporated into PCB designs of the subsystem

Technical Skills

Languages C, C++, Python, Julia, MATLAB, Scilab, LaTeX, HTML, CSS, SQL, Embedded C, VHDL, MIPS, 8086
Frameworks Git, Docker, SageMath, Qiskit, NumPy, SciPy, pandas, scikit-learn, OpenCV, TensorFlow, Keras, Jekyll

Extracurriculars

Volunteering *(2019-2022)*
- Contributed to Career Counselling Campaign for 12,000+ indigent students by **Abhyuday** and **NCC**
- **Mentored** students appearing for JEE during the **COVID-19** crisis as a part of **CovEd Education**

Miscellaneous *(2019-2022)*
- Composed articles on exciting labs and scientific content as an **Editor** of the Department Newsletter
- Completed a year-long **training program** as **NCC Cadet** under 2 MER NCC at IIT Bombay
- Part of the **Inter-Department E-Sports** Fest winning squad representing the **Smashkarts** team