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	2024	9.03

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

Scholastic Achievements

- Achieved a perfect **10 SPI** during the 8th and 9th semesters at IIT Bombay with 36 and 48 credits, respectively *(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)*

Key Projects

NVIDIA | Modeling the NVLink pipe ID in the GPU performance simulator *(May 2022 - Jul 2022)*
Guide: Raghuram L *(GPU Subsystem | ASIC Intern)*
- 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

Visual Learning and Recognition of 3-D Objects from Appearance *(Oct 2023 - Nov 2023)*
Guide: Prof. Ajit Rajwade *(CS663 | Fundamentals of Digital Image Processing | Course Project)*
- Implemented a high-performance training and testing pipeline for object detection and pose estimation using **Python**
- Achieved an object recognition accuracy of **99.172%** and a mean pose error of **6.872°** by using the **COIL-100** dataset

Efficient Cache Replacement Policy using Reinforcement Learning *(Sep 2023 - Nov 2023)*
Guide: Prof. Biswabandan Panda *(CS683 | Advanced Computer Architecture | Course Project)*
- Designed Micro-Armed Bandit-based (MAB) replacement, utilising **temporal homogeneity** in the action space of policies
- Evaluated both policies in **ChampSim** using 49 memory intensive traces from **SPEC** 2017 benchmarks and achieved an overall IPC speedup over LRU of **5%** for RLR and **1.2%** for MAB with LRU, SHiP, SRRIP, DRRIP in its action space

Intelligent and Learning Agents *(Jul 2021 - Nov 2021)*
Guide: Prof. Shivaram Kalyanakrishnan *(CS747 | Foundations of Intelligent and Learning Agents | Course Project)*
- 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

Positions of Responsibility

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

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

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	• Contributed to Career Counselling Campaign for 12,000+ indigent students by **Abhyuday** *(2019)*
Miscellaneous	• Composed articles on exciting labs and scientific content as an **Editor** of Department Newsletter *(2020)* • Completed a year-long **training program** as **NCC Cadet** under 2 MER NCC at IIT Bombay *(2019)*