PARTH VINOD PATIL

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Education

Purdue University | Master of Science in Electrical & Computer Engineering [Jan'24-Present]
Courses – Introduction to Robot Learning, Advanced Software Engineering

Indian Institute of Technology – Bombay (IIT-B) | B.Tech in Electrical Engineering with honours [Aug'17-Jun'21]
Courses – Advanced Topics in Machine Learning, Digital Image Processing, Control Systems, Linear Alegbra

Professional Experience

Software Engineer 2 | Drivetrain Ai Technologies [Jan' 23 – Jan' 24]

- Upgraded website-wide search with **ElasticSearch** leveraging synonyms and integrated **Java client** in the backend, boosting hit rate by **3x** and delivering faster and more accurate search results.
- Built a ChatGPT integration in search, capable of performing complex action, which simplified user interactions.

Robotics Engineer (Level 2) | Udaan (B2B Marketplace App) [July' 21 – Jan'23]

- Led the development of a warehouse automation system that is a swarm of Automated Guided Vehicles (AGVs) called 'Mushak', capable of lifting racks of 500kgs and navigating the layout avoiding obstacles
- Deployed **multi-robot path planning** algorithm based on **D* & node reservation**, yielding zero collision paths.
- Architected the **Fleet Management Service**, responsible for optimal task allocation, path planning, and Warehouse Management System (WMS) integration; capable of managing any fleet of robots.
- Engineered a ROS-like alternative using ZMQ, for faster networking up to 1000 Hz on embedded electronics.

Research Intern | Samsung Research Institute Bangalore (SRIB) [May 20 – July 20]

- Collaborated on the development of Samsung SmartThings Hub 3 with the IoT R&D team at SRIB.
- Migrated device health monitoring from the cloud to a Hub 3 based system **saving $23 millions in cloud costs**.

Key Projects

Autonomous Underwater Vehicle (AUV)| Software Subdivision Lead [Sep 17 – June 21]

- Fabricated 'Matsya', an autonomous underwater vehicle with a **5 million** INR budget, which is equipped with visual, acoustic, and depth sensors and underwater communication systems for realistic naval missions.
- Orchestrated **YOLO V2 integration** for vision, significantly increasing detection accuracy of abstract objects
- Implemented **Extended Kalman Filter** based **sensor-fusion** estimation that reduced position drifting by 90%.
- Collaborated with 'Larsen & Toubro Defence' to design an underwater Remotely Operated Vehicle (ROV) deployable in seawater for scanning ship hulls & for surveillance in pots and ocean.

Google Summer of Code (GSoC) | Django Software Foundation [May 19 – Aug 19]

- Amongst the **only 2** students shortlisted by Django Software Foundation, out of **16.8%** accepted students.
- Optimized **FormSet** and similar classes to use declarative syntax, boosting user-friendliness and productivity.
- Created an 'edit only' mode in ModelFormSet to prevent injection attacks, improving overall security.

Anomalous Human Activity Detection |B.Tech Thesis [Aug 20 – Apr 21]

- Worked on a novel framework for Anomaly Detection in CCTV videos, using only a few frames, which were processed through a **Prototypical CNN**, capable of detecting robbery, accidents, cyclists on a footpath, etc.

Skills and Experience

Languages	C++, Python, Java, Kotlin, Bash, C, Groovy, Rust, Ruby, Golang, Assembly, VHDL
Web	HTML, CSS, JS, TS, Django, REST, Angular, Node, React, Jekyll, Flask, Jinja, AWS-Amplify
Frameworks	ROS, Pygames, CUDA, IsaacGym, OpenCV, PyTorch, Pandas, Flutter, SolidWorks, Blender
Electrical	Arduino, Raspberry Pi, Tinker-Board, NodeMCU, Crypton FPGA, STM, Beaglebone