

PARTH VINOD PATIL

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Summary

A Robotics engineer with 3+ years of industry experience, and proven expertise in developing autonomous systems, including robots capable of lifting 500kgs or diving 50m underwater; proficient with controls, navigation, machine learning.

Education

Purdue University Master of Science in Electrical & Computer Engineering [Jan' 24 - Present]
• GPA 4.0/4.0 • 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 Machine Learning, Digital Image Processing, Control Systems, Linear Algebra, Vector Calculus

Professional Experience

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

- Upgraded website-wide search with **ElasticSearch** boosting hit rate by 3x and delivering search results within 200ms.
- Built a ChatGPT integration for search, automating actions and reducing metric creation time from 10 mins to few seconds.

Udaan | Robotics Engineer 2 [Jul' 21 – Jan' 23]

- Led the development of autonomous **swarm robots** based Goods-To-Person system in a warehouse called 'Vahaan', capable of lifting racks of 500kgs (a high payload weight class) and navigating the layout avoiding human 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, enabling picking 14 items per minute.
- Engineered a ROS-like alternative using ZMQ, for faster networking of up to 1000 Hz on embedded microcontrollers.

Samsung Electronics | Research Intern [May' 20 - Jul' 20]

- Collaborated on the development of **Samsung SmartThings Hub 3** by migrating device health monitoring from the cloud to a Hub 3 based system with edge computing and using Kafka for syncing events thus saving **\$23 millions** in cloud cost.

Research & Projects

Object manipulation with four Legged Robots | Research | Guide: A. Qureshi [Jan' 24 - Present]

- Improvise a novel approach for using the leg of the quadruped as a manipulator using Unitree B1 inside Isaac Gym.

Anomalous Human Activity Detection | Research | Guide: R. Velmurugan [Aug' 20 – Apr' 21]

- Engineered on a novel framework for anomaly detection in CCTV videos, leveraging Prototypical CNN to analyze only 5 normal frames and identify anomalies such as robbery, accidents, over-speeding cars, etc in videos

Autonomous Underwater Vehicle (AUV) | Software Subdivision Lead [Sep' 17 – Jun' 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.

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

- Optimized FormSet and similar classes to use declarative syntax, boosting user-friendliness and productivity of forms.
- Created an 'edit only' mode in ModelFormSet to prevent SQL injection attacks, improving overall security of models.

Skills and Experience

Languages	C++, Python, Java, Kotlin, Bash, C, Groovy, Rust, Ruby, Golang, Assembly, VHDL
Frameworks	• Robotics: ROS, Gazebo, IsaacGym, MuJoCo • AI/ML: PyTorch, OpenCV, TensorFlow, Pandas
Electrical	Arduino, Raspberry Pi, Tinker-Board, NodeMCU, Crypton FPGA, STM, Beaglebon
Responsibilities	Academic Mentor IITB, Manager at Coding Club, Teaching Assistant, Technical Mentor