

# PARTH VINOD PATIL

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## Summary

A Robotics Engineer with 3+ years of industry experience and proven expertise in developing software and hardware solutions for autonomous systems; proficient with machine learning, IoT, and embedded systems, and a strong passion for continuous 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 honors [Aug' 17 - Jun' 21]  
Courses – Advanced Machine Learning, Digital Image Processing, Control Systems, VLSI Design, Microprocessors

## Publications

**ISCE Enabling Unit Proofing for Software Implementation Verification** 2024  
47th IEEE/ACM International Conference on Software Engineering - NIER Track (ICSE) [submitted]

## Professional Experience

**Drivetrain Ai Technologies** | Software Development 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 a 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 faster picking for items.  
• 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 million** in cloud cost.

## Research & Projects

**Object Manipulation with four Legged Robots** | Research | Guide: A. Qureshi [Jan' 24 – Jul' 24]  
• Improvised 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 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 visual, acoustic, and depth sensors for realistic naval mission.  
• Implemented Extended Kalman filter-based sensor-fusion estimation that reduced pose estimation 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++, c#, Python, Java, Kotlin, Bash, C, Groovy, Rust, Ruby, Go, Assembly, VHDL
Frameworks	• <b>Robotics</b> : ROS, Gazebo, IsaacGym, MuJoCo • <b>AI/ML</b> : PyTorch, OpenCV, TensorFlow, Pandas
Electrical	Arduino, Raspberry Pi, Tinker-Board, NodeMCU, Crypton FPGA, STM, Beaglebone, Linux
Responsibilities	Academic Mentor IITB, Manager at Coding Club, Teaching Assistant, Technical Mentor