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]

Indian Institute of Technology – Bombay (IIT-B) B.Tech in Electrical Engineering with honors [Aug' 17 - Jun' 21]

Publications

ICSE **Recommending Pre-Trained Models for IoT Devices** | **PV Patil**, W Jiang, H Peng, et al. 2025
47th IEEE/ACM International Conference on Software Engineering - SERP4IoT Workshop

ICSE **Enabling Unit Proofing for Software Implementation Verification** | PC Amusuo, **PV Patil**, et al. 2025
47th IEEE/ACM International Conference on Software Engineering - NIER Track

Professional Experience

Amazon Robotics | Manufacturing Test Engineer co-op [Jan' 25 - Aug' 25]
- Contributed to the development of a manufacturing test solution for a state-of-the-art end-of-arm tooling system.
- Engineered a communication protocol between PLC hardware and a Python application to enable automated testing.

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.

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.

Formally verified controller synthesis from Natural Language | Research | Guide: James C. Davis [Aug' 24 – Present]
- Developing a method to synthesize controllers from natural language prompts verified with LTL specifications for correctness.

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	Python, C++, C#, Java, Kotlin, Bash, C, Groovy, Rust, Ruby, Go, Assembly, VHDL, ST
Frameworks	▪Robotics: ROS, Gazebo, IsaacGym, Codesys ▪AI/ML: PyTorch, OpenCV, TensorFlow, Pandas
Electrical	Arduino, Raspberry Pi, Tinker-Board, NodeMCU, Crypton FPGA, STM, Beaglebone, Linux