Parth Potdar

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Education

University of Cambridge – MEng in Information & Computer Engineering Oct 2021 – July 2025
Grade: Distinction with Honours - Double 1st, ranking top 20%
Thesis: Uncertainty in Navigation (Computational Neuroscience)

University of Cambridge – BA in Aerospace Engineering

Skills

ML: Pytorch, Deep Learning, Computer Vision, Reinforcement Learning, Probabilistic ML
Robotics: ROS2, Gazebo (Simulation), SLAM, Sensor Fusion, PX4/Ardupilot
Software: Python, C/C++, Linux, Docker, Git, MATLAB, Simulink
Hardware: Embedded Systems, CAD, Rapid Prototyping (3D Printing)

Experience

Robotics & ML Engineer, SAIF Autonomy – London, UK July 2025 – March 2026

- Developed MVP for safety-critical assurance layer (ASTM F3269-21) for autonomous systems, designing system architecture, module interfaces, and data flow for deployment.
- Engineered real-time multi-objective optimization algorithms and deterministic models, ensuring autonomous navigation met strict computational and safety constraints.
- Prototyped a real-time privacy censorship system for autonomous drones using geometric computer vision, enabling compliance with regulatory and privacy standards.
- Conducted exploratory research on Deep Reinforcement Learning (PPO) for control of complex satellite systems.

Research Intern, Bristol Robotics Lab – Bristol, UK July 2024 – Sept 2024

- Led the design of an autonomous drone featuring a novel tendon-actuated perching mechanism, enhancing energy efficiency for forest monitoring applications.
- Developed 3D perception and navigation pipelines using depth Cameras, YOLOv8-based branch detection, and VIO SLAM, enabling autonomous flight in complex environments.
- Integrated and tested hardware, including NVIDIA Jetson Orin Nano and FCU, conducting real-world perching experiments; work culminated in a publication at IROS 2025.

Research Intern, University of Cambridge – Cambridge, UK July 2023 – Sept 2023

- Developed a state-of-the-art Braille-reading robot achieving 315 WPM at 87.5% accuracy, published in IEEE-RAL.
- Built a real-time tactile perception pipeline using PyTorch autoencoders, YOLOv8 detection, and NLP error correction, enabling high-speed and accurate Braille recognition.
- Designed the robotic system and tactile sensing setup, integrating a UR3 arm, DIGIT sensor, Arduino, and custom 3D-printed adapter to enable seamless hardware-software coordination.

R&D Software Intern, Hexagon – Nottingham, UK July 2022 – Sept 2022

- Developed ML models in PyTorch to predict gearbox component safety factors and damage with <1% error, benchmarking against proprietary ROM tools to validate accuracy and reliability.
- Automated data gathering and model creation by integrating Python and C++ APIs with proprietary packages, accelerating evaluation across multiple load cases.
- Designed prototype software and a custom clustering algorithm to enhance gearbox durability predictions; presented results to project managers, informing design decisions.

Publications & Projects

Uncertainty in Navigation (Computational Neuroscience)
Master's Thesis - 2025

- Investigated spatial navigation as probabilistic inference under perceptual uncertainty, developing scalable particle filters for vision-based allocentric localisation.
- Integrated deep learning models (NeRFs, deconvolutional networks, energy-based models) into Bayesian inference pipelines using PyTorch, optimizing for inference-time efficiency and uncertainty representation.
- Applied computational neuroscience principles to model how agents maintain and update spatial beliefs in partially observed environments.

High-Speed Tactile Braille Reading via Biomimetic Sliding Interactions
Potdar, P., Hardman, D., Almanzor, E., & Iida, F. (2024). IEEE-RAL
DOI: 10.1109/LRA.2024.3356978

Tendon-driven Grasper Design for Aerial Robot Perching on Tree Branches
Li, H., Zhao, Z., Wu, Z., **Potdar, P.**, Tran, L., et al. (2025). IROS 2025
DOI: 10.1109/IROS60139.2025.11247040