# Aalok Patwardhan

*Dyson Robotics Lab, Imperial College London*
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## Education

**PhD — Robotics and Computer Vision** *London, UK*
Imperial College London — Dyson Robotics Lab *2021 – now*
*Advisor: Prof. Andrew J. Davison FREng FRS*

- **Distributed Multi-Robot Coordination** using Gaussian Belief Propagation (GBP).
- **Monocular Visual Odometry** using RGB data for Simultaneous Localisation and Mapping **(SLAM)**.

**MEng Engineering — 1st Class** with **Distinction** *Cambridge, UK*
University of Cambridge – Emmanuel College *2014 – 2018*

- Computer Vision | Signal Processing | Control Systems

## Relevant Experience

**Peer Reviewer** — IEEE Conferences: (ICRA, IROS) | American Control Conference (ACC)

**Director of Studies, Engineering and AI** — Cambridge Programmes Ltd. *2023 – now*

- Designing and leading an engineering curriculum for a two week academic summer school with a focus on generative AI.

**Signal Processing Engineer** — Cambridge Consultants Ltd. *2018 – 2021*

- Lead engineer retrofitting generative deep learning models for use in the recovery of lossy compressed audio data.
- Researched and implemented low-power signal processing algorithms for embedded systems, improved efficiency by 50%.

**Undergraduate Research Placement** — University of Cambridge, Toyota Motors Europe *2017*

- Modelled the effects of predictive control to minimise discomfort in humans using the Internal Model principle behind 'why we can't tickle ourselves'. Liaised with TME for validation against experimental results.

## Publications

- **Patwardhan, Aalok**, Murai, Riku, Davison, Andrew J. 2023. Distributing Collaborative Multi-Robot Planning With Gaussian Belief Propagation. IEEE Robotics and Automation Letters, 8(2): 552-559. doi: 10.1109/LRA.2022.3227858.
- **Patwardhan, Aalok**, Davison, Andrew J. 2023. Distributed Formation Planning for Robot Swarms. Workshop on Distributed Graph Algorithms for Robotics at ICRA, 2023.
- **Patwardhan, Aalok**, Davison, Andrew J. 2023. A Distributed Multi-Robot Framework for Exploration, Information Acquisition and Consensus. doi.org/10.48550/arXiv.2310.01930. ***(Under Review at ICRA 2024)***.

## Awards

2021 – 2025 **Research Fellowship**, Dyson Ltd. & EPSRC
2023 **Best Poster Prize (runner-up)**, Imperial College London PhD Competition
2018 **Wallace Prize in Engineering**, Emmanuel College, University of Cambridge

## Teaching Experience

2022 – now **Teaching Assistant, Robotics**, Imperial College London
2017 – now **Private Tutor**, GCSE, A-Level Mathematics and Physics, University Admissions Guidance
2015 – now **Lead Mentor**, Cambridge Programmes Ltd. Summer School

## Skills

Software Development Python, Numpy and Pytorch for deep learning. Parallelised C++ for distributed algorithms, 3D simulation and OpenGL graphics.

Languages Fluent in English, Marathi and Hindi. Conversational in Spanish and French.