Dexter Ong

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Education

2022–Present   **Doctoral Program (Ph.D.) in Computer and Information Science**, *University of Pennsylvania*,
I work with Pratik Chaudhari and Vijay Kumar on agile autonomy in cluttered environments with neuromorphic vision and scene understanding

2022–2024   **M.S.E. Robotics**, *University of Pennsylvania*,
Deep Learning, Robotics, Machine Perception, Controls

2015–2019   **Bachelor of Engineering (Honours) in Electrical Engineering**, *National University of Singapore*,
- Dissertation – Dynamic Object Tracking and Classification Using a Multi-Camera System
- NUS Overseas Colleges – Silicon Valley
  Entrepreneurship program involving a year-long internship at a start-up in San Francisco and classes in the MS&E program at Stanford University

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Experience

2019–2022   **Robotics Research Engineer**, *DSO National Laboratories*, Singapore
Worked with Dr. Lionel Heng in the Robotics Autonomy Lab
- Developed vision-, LiDAR- and radar-based perception and localisation algorithms for field robots – sensor calibration, 3D vision, scene understanding, autonomy in adverse weather, object detection and tracking
- Contributed to Project AutoVision in collaboration with the Computer Vision and Geometry Lab of ETH Zurich
- Developed a portable stereo vision kit for vision-based autonomy and transited it to a project with industry partners
- Led the development of a data-collection vehicle including specification and integration of the sensor suite and onboard compute.

2018–2018   **Engineering Intern**, *Carbon Robotics*, San Francisco
Contributed to a robotic arm system for machine-tending tasks (12 mos)
- Worked on critical electrical, embedded, software systems, supporting the delivery of critical milestones including deployment and testing on-site on the assembly line
- Designed and integrated the elbow LED board including PCB design and firmware for interfacing with motor driver boards

2017–2017   **Research Intern**, *DSO National Laboratories*, Singapore
Cybersecurity and robotics projects (7 mos)
- Disassembly, tracing and modification of microcontroller firmware
- Unconstrained non-linear optimisation of polynomial-based trajectories
- Localisation through trilateration of multiple ultra-wideband sensors with an Extended Kalman Filter
- Range Image-based Segmentation of LiDAR Data

2016–2016   **Engineering Intern**, *TinyMOS*, Singapore
Firmware development for astrophotography camera (2 mos)

2016–2016   **App Developer**, *Memento Health*, Singapore
UNFRAMED Accelerator for social challenges (2 mos)

Awards

2022 **Soloman M. Swaab Fellowship**
Awarded in recognition of outstanding academic accomplishments and research potential

Publications

[1] Siming He, Christopher D Hsu, Dexter Ong, Yifei Simon Shao, and Pratik Chaudhari. Active perception using neural radiance fields. *arXiv preprint arXiv:2310.09892*, 2023. (Accepted ACC 2024).

[2] Ankit Prabhu, Xu Liu, Igor Spasojevic, Yuwei Wu, Yifei Shao, Dexter Ong, Jiuzhou Lei, Patrick Corey Green, Pratik Chaudhari, and Vijay Kumar. Uavs for forestry: Metric-semantic mapping and diameter estimation with autonomous aerial robots. *Mechanical Systems and Signal Processing*, 208:111050, 2024.