Derek Ming Siang **Tan**

PH.D. CANDIDATE · ROBOTICS SOFTWARE ENGINEER

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My long-term goal is to bring multi-robot systems into everyday life through fundamental research.

Education

National University of Singapore, Singapore   *Jan. 2023 - Present*

PH.D MECHANICAL ENGINEERING (ROBOTICS)   *GPA: 4.8 / 5.0*

- Research Focus: Distributed Robotics System, Reinforcement Learning, Multi-Modal Foundation Models
- Coursework: Advanced Topics in Reinforcement Learning, Advanced Topics in Vision-Language Models

University of Michigan, Ann Arbor, USA   *Sept. 2016 - May. 2020*

B.S.E MECHANICAL ENGINEERING, COMPUTER SCIENCE (MINOR)   *GPA: 3.74 / 4.0*

- Coursework: Autonomous Robotics, Web Systems, Data Structures & Algorithms, Deep Learning for Computer Vision

Publications

IR2: Implicit Rendezvous for Robotic Exploration Teams under Sparse Intermittent Connectivity   *Oct. 2024*

DEREK MING SIANG TAN, YIXIAO MA, JINGSONG LIANG, YI CHENG CHNG, YUHONG CAO, GUILLAUME SARTORETTI

- Oral presentation (extended) at IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).

Context Mask Priors via Vision-Language Model for Ergodic Search   *May. 2024*

DEREK MING SIANG TAN, ANANYA RAO, ABIGAIL BREITFELD, GUILLAUME SARTORETTI

- Workshop poster at IEEE International Conference on Robotics and Automation (ICRA).
- In Collaboration with Carnegie Mellon University, Robotics Institute.

Privileged Reinforcement Learning for Distributed, Bandwidth-limited Multi-Robot Exploration   *Nov. 2024*

YIXIAO MA, JINGSONG LIANG, YUHONG CAO, DEREK MING SIANG TAN, GUILLAUME SARTORETTI

- Oral presentation at International Symposium on Distributed Autonomous Robotic Systems (DARS).

Work Experience

Singapore Technologies Engineering, Smart Systems Center   *Jan. 2024 - Present*

ROBOTICS SYSTEM ARCHITECT (MULTI-ROBOT SYSTEM DESIGN)   *Singapore*

- Formulated a decentralized multi-robot communication framework to enable collaborative perception, navigation, and task allocation.
- Designed the system and software architecture for robust mesh communication networks for multi-UAV photogrammetry applications.

Singapore Technologies Engineering, Software Engineering Center   *Aug. 2020 - Dec. 2023*

ROBOTICS SOFTWARE ENGINEER (MULTI-ROBOT SLAM)   *Singapore*

- Spearheaded the development of a heterogenous robotic fleet to map unknown environments using lidar + vision-based SLAM.
- Developed a map stitching module that merges RGBD map segments via keypoint correspondences and inter-robot visual loop closures.

Ilmor Engineering, R&D Department   *Jan. 2018 - Dec. 2018*

STUDENT RESEARCHER (SPEED BOAT ENGINE OPTIMIZATION)   *Michigan, USA*

- Redesigned inlet port geometries and vane impellers of the rotary-vane pump system to improve flow rate by 16% and durability by 7 hours.

Honors & Awards

2022	**PhD Full-Ride Scholarship**, Economic Development Board – Industrial Postgraduate Program (EDB-IPP)	*Singapore*
2019	**Inter-disciplinary Prize Winner**, Amazon Makeathon	*Michigan, USA*
2017	**Academic Excellence Award**, James B. Angell Scholar	*Michigan, USA*
2016	**Undergraduate Full-Ride Scholarship**, Singapore Technologies Engineering Overseas Scholarship	*Michigan, USA*

Other Activities

BLUElab Bangladesh Thermoelectric Cooling Research   *Dec. 2017 - April. 2020*

STUDENT RESEARCHER, CO-FOUNDER (THERMODYNAMICS)   *Dhaka, Bangladesh*

- Formalized partnership with Spreeha Foundation to provide cost-efficient cooling solutions to urban slum residents in Dhaka.
- Research with Professor M. Kaviany to design a $43 Thermoelectric Cooler prototype, delivering 90 CFM, 2.2m/s air flow, and 3° cooling.

Reviewer	Conference on Robot Learning (CoRL 2023)
Certification	Unmanned Aircraft Pilot License (UAPL), DRL Udacity Nanodegree, Sensor Fusion Udacity Nanodegree