MICKEY LI

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- 5+ Years of experience in developing experimental multi-robot systems with ROS, PX4 and Ardupilot
- Control and Design of Multi-agent systems, Co-ordination, Path Planning and SLAM for Multi-drone systems
- Optimisation, Statistics, Generative Methods, Reinforcement Learning and Machine Learning techniques
- Extensive experience with independent research, leading projects, publishing and industrial collaboration

EDUCATION

PhD, Robotics and Autonomous Systems — Sept 2018 - Oct 2023

University of Bristol, Bristol Robotics Laboratory & Toshiba Bristol Research and Innovation Laboratory.

Thesis: Reliability-Aware Multi-UAV Coverage Path Planning (Submitted, est. Viva Oct 2023)

MEng Mathematics and Computer Science — Oct 2014 - Jun 2018

Imperial College London. Graduated with First-Class Honours.

Thesis: Real Time Semantic Segmentation with SLAM for Gaze Intention Decoding from ego-centric video.

MAJOR PROJECTS AND EXPERIENCE

Optimal Topologies for Drone Vertiports — March 2023 - February 2023

Postdoctoral Research Associate — *University of Bristol Flight Laboratory*

- In a team of 4, responsible for investigating optimal topologies for collision free approaches for deployable drone vertiports, and designing systems and user interfaces for safety-critical multi-drone operations in practice.
- Interaction and Collaboration with numerous industrial partners to achieve project goals.
- Demonstrated successful multi-drone flight outdoors in front of research council assessors.

Reliability-Aware Multi-UAV Coverage Path Planning for 3D Environments — April 2019 - Oct 2023

PhD Submitted, Supervised by Prof. Arthur Richards — *Bristol Robotics Laboratory*

- Investigating how to optimally utilise failure prone agents to maximise the reliability of mission completion.
- I developed a novel probabilistic reliability metric which quantifies the reliability of a multi-UAV coverage plan plan in general 3D environments, given individual UAV failure models.
- Investigated numerous optimisation methods including Integer Linear Programming and Genetic Algorithms in order to find reliability-optimal path plans. 3D environments required methods which were scalable and computational efficiency. Methods were evaluated in simulation and reality on a number of aircraft inspection scenarios
- Designed, pre-registered and ran a thorough month long practical multi-drone experiment to test our hypothesis.
- Published and Presented the work at national and international conferences such as AAMAS and ICRA.

Project Starling - Implementing Cloud Inspired Flight Infrastructure for Multi-Drone Development, Deployment and Testing — Jan 2021 - June 2023

Lead Project Manager and Developer — *Bristol Robotics Laboratory, Flight Arena*

- Took the initiative for envisioning, designing and implementing a scalable and reusable open-source single and multi-drone development and deployment architecture to address the lack of consistent, efficient and reproducible aerial research.
- Using cloud technologies such as Docker and Kubernetes with traditional Robotics and drone tools such as ROS2, PX4 and Gazebo to allow for a simplified workflow to reduce the barrier to entry for students and researchers.
- Heavily used in my PhD, in 4 other research projects, for 2 years in MSc level teaching, as well as in 4 MSc dissertations.

SKILLS, INTERESTS, AWARDS AND PUBLICATIONS

Programming and Systems Experience

- Python, C++, C, Cython, Javascript, GO, Rust, Haskell, R, Matlab
- Docker, Kubernetes, Apache Spark, Unreal Engine, Unity, Airsim, OpenGL, OpenCV, PCL
- ROS/ROS2, Gazebo PX4, Ardupilot, Arduino, Raspberry Pi, basic electronics, CAD and 3D Printing

Publications	Scitech 2024, RSS EMIRCATE 2023, ICRA 2021, AAMAS 2021, UKRAS 2020
Awards & Certifications	Bristol PLUS Award, UK Drone License A2 CoC & GVC (2021-2026)
Languages	English (Native), Mandarin and Cantonese (Intermediate Spoken, Basic Comprehension)

Extensive Presentation, Public Speaking, Project Management and Teamwork Experience

References Available upon Request