

MICKEY LI

1 Greystoke Avenue ◊ Bristol ◊ United Kingdom ◊ BS10 6AG ◊ August 16, 2022

Website: mickeyhl.li ◊ Email: mickeyhli@outlook.com

Github: [mhl787156](https://github.com/mhl787156) ◊ LinkedIn: [mickeyhaolinli](https://www.linkedin.com/in/mickeyhaolinli) ◊ Mobile: +44 7980639802

EDUCATION

PhD Candidate, Robotics and Autonomous Systems Sept 2018 - Present
University of Bristol, Bristol Robotics Laboratory & Toshiba Bristol Research and Innovation Laboratory.
FARSCOPE Centre for Doctoral Training in Future Autonomous and Robotic Systems
Thesis: (Ongoing)

Failure and Robustness in Multi-Agent Coverage Path Planning for Reliability-Aware Structural Inspection.
supervised by Prof. Arthur Richards, Prof. Andrew Calway & Prof. Mahesh Sooriyabandara

MEng Mathematics and Computer Science Oct 2014 - Jun 2018
Imperial College London. Graduated with First-Class Honours.

Taunton School Aug 2009 - Jun 2014
A-levels: *Further Maths A**, *Maths A**, *Physics A*, *Music A*, *EPQ A*
GCSEs: *8A* incl. mathematics*, *2A incl. english*, *2B*

MAJOR WORKS AND PAST EXPERIENCES

Reliability-Aware Multi-UAV Coverage Path Planning for 3D Environments April 2019 - Ongoing
PhD Topic Ongoing, Supervised by Prof. Arthur Richards *Bristol Robotics Laboratory*

- Investigating how to optimally utilise failure prone agents to maximise the reliability of mission completion.
- Taking a probabilistic approach, I developed a novel reliability metric which quantifies the reliability of a multi-UAV coverage 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

Project Starling - Implementing Cloud Inspired Flight Infrastructure for Multi-Drone Development, Deployment and Testing Jan 2021 - Ongoing
Lead Project Manager and Developer *Bristol Robotics Laboratory, Flight Arena*

- Developing, designing and implementing a scalable and reusable flight controller development and deployment architecture for single and multi-drone research.
- Using cloud technologies such as Docker and Kubernetes with traditional Robotics and drone tools such as ROS2 and PX4 to allow for a simplified workflow to reduce the barrier to entry for researchers.
- Now used by others for MSc level teaching and various internal projects.
- <https://github.com/StarlingUAS/ProjectStarling>

Implementing real-time generation of 4pl motion trajectories for real drones Nov 2021 - Feb 2022
Research Associate (under Prof. Arthur Richards) *Bristol Robotics Laboratory, University of Bristol*

- Primary role of developing and implementing the 4pl fast motion planning algorithm for an experimental demonstration on real drones within Starling in collaboration with the original author.
- Re-implemented algorithm in Rust for speed, and real flight required development of augmented MPC formulation, as well as consideration of noise and practical demonstration of dynamic obstacle avoidance.

Real Time Semantic Segmentation with SLAM for Gaze Intention Decoding April 2018 - Aug 2018
MEng Dissertation, Supervised by Dr Aldo Faisal & Dr Stefan Leutenegger *Imperial College Faisal Lab*

- The aim was to develop a real time system which could label and position items which a user was gazing at.
- A novel real-time semantic segmentation network called YoloMask was developed and trained.
- Network was integrated into the SemanticFusion SLAM mapping system and integrated with Ego-Centric Glasses

POSITIONS OF RESPONSIBILITY

Masters Thesis Supervision Roles

Oct 2020 - Present

- Significant Supervision experience of total of nine robotics masters students on topics ranging from multi-vehicle path optimisation, drone reliability, marsupial robotics control and implementing UAV applications. Requires good communication, teaching and interpersonal skills. Students were successful in submitting dissertations.

Teaching Assistant

Oct 2019 - Present

- Small group teaching of foundational mathematics, logic and programming to undergraduate and masters level engineering and computer science students. Requires good co-operation between TAs and the course leaders.
- Developed and taught the Starling simulation environment and programming fundamentals for the Aerial MSc Group project course. Required the writing and delivery of several lectures in addition to running group tutorials.
- Organised and delivered a two day workshop on an introduction to the Starling UAV system which aimed to bring students from software basics to flying real drones. Attended by students and researchers within the department.

President

Oct 2016 - Sept 2017

Imperial College Chamber Music Society

- Dealt with management committees, acquiring funds and providing a worthwhile experience for our members. Increased membership and satisfaction by 40%

PUBLICATIONS

Asynchronous Reliability-Aware Multi-Agent Coverage Path Planning

ICRA 2021

M. Li, A. Richards, M. Sooriyabandara

Reliability-Aware Multi-Agent Coverage Path Planning Using a Genetic Algorithm

AAMAS 2021

Extended Abstract: M. Li, A. Richards, M. Sooriyabandara

Towards an Embodied Semantic Fovea: Semantic 3D scene reconstruction from ego-centric eye-tracker videos

ECCV 2018

Extended Abstract: M. Li, N.Songur, S Leutenegger, AA Faisal

SKILLS AND INTERESTS

Research Interests

- 2D/ 3D Object detection, Semantic and instance segmentation, scene reconstruction
- CNNs, Generative Networks, Reinforcement Learning and Machine Learning techniques
- Control and Design of Multi-agent systems, Path Planning and SLAM for Multi-drone systems.

Programming Languages

Python, C++, C, Arduino, Javascript, Rust, Haskell, R, Matlab

Tools

ROS/ROS2, PX4, Docker, Kubernetes, TensorFlow, Spark, Unreal Engine

Languages

English (Native),

Mandarin and Cantonese (Intermediate Spoken, Basic Comprehension)

EXTRA-CURRICULAR ACTIVITIES

Attended IEEE Multi-Robot Systems Summer School (Virtual), Czech Technical University

Aug 2020

Attended Roche Continents, Salzburg, Austria

Aug 2018

Chinese Language Course, Beijing Language and Culture University

Aug 2014

Diploma (DipABRSM) in Piano Performance; Placed 3rd in EPTA Piano Competition

2013

References available upon request