Charlie Street

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Research

I am a DPhil student in the Goal-Oriented Autonomous Long-Lived Systems lab at the Oxford Robotics Institute, University of Oxford. My research is focused on the robust continuous-time coordination of multi-robot systems under uncertainty. To achieve this, I apply planning, model checking, and task allocation techniques to continuous-time models of multi-robot behaviour.

Research Interests

- Multi-Robot Planning Under Uncertainty
- Formal Methods for Multi-Robot Systems
- Continuous-Time and Non-Stationary Planning Models
- Multi-Robot Task Allocation

Education

- **DPhil in Engineering Science at the University of Oxford** **2018-2022**
  - Thesis: *Multi-Robot Coordination Under Temporal Uncertainty*
  - Supervisors: Nick Hawes, Bruno Lacerda, and Manuel Mühlig
  - Expected Submission Date: June 2022
- **MSci in Computer Science at the University of Birmingham** **2014-2018**
  - Thesis: *IntelliJam: An Intelligent Agent for Musical Improvisation*
  - Supervisor: Peter Tino
  - Degree Class: First Class with Honours (Average: 92%)
  - Awarded Undergraduate Distinguished Dissertation Prize 2018
  - Awarded Best in Degree Programme 2014/15, 2015/16, 2016/17, and 2017/18
  - Awarded BCS Prize for Best in Year 2014/15
  - Awarded IBM Team Project Prize 2015/16

Projects

- **Team ORIon (RoboCup Competition Team)** **2019-2021**
  - Deploying Service Robots in Domestic Environments
  - Lead Team ORIon and Task-Level Planning Sub-Team
- **First Fleet** **2020-2021**
  - Deploying Multi-Robot Fleets in Agricultural Environments
  - Implemented Multi-Robot Planning System

Supervision

Fourth Year Projects

- **Alex Rutherford (with Bruno Lacerda and Nick Hawes)** **2021 - 2022**
  - Topic: *Multi-Agent Reinforcement Learning with a Model-Based Simulator*
- **Yifeng Wei (with Bruno Lacerda)** **2020 - 2021**
  - Topic: *Trial-Based Search for Generalised Stochastic Petri Nets*
- **James Wheadon (with Nick Hawes)** **2019 - 2020**
  - Topic: *Multi-Agent Path Finding in Continuous Time*
- **Han Zhou (with Bruno Lacerda)** **2018 - 2019**
  - Topic: *Auctioning for Multi-Robot Coordination*

Internships

- **Tom Liu (with Nick Hawes)** **2021**
  - Topic: *Generalising Duration Distributions across Topological Maps*
- **Clarissa Costen (with Nick Hawes)** **2019**
  - Topic: *Continuous-Time Markov Chains for Shared Autonomy*

Outreach

- **Led Robot Demonstrations at Goodwood Festival of Speed** **2021**
- **Led Robot Demonstration at University Open Day** **2019**
- **Assisted with Robot Demonstration at Blenheim Palace** **2019**

Publications

[1] Charlie Street, Bruno Lacerda, Michal Staniaszek, Manuel Mühlig, and Nick Hawes. "Context-Aware Modelling for Multi-Robot Systems Under Uncertainty". In: *Proceedings of the 21st International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*. 2022

[2] Charlie Street, Sebastian Pütz, Manuel Mühlig, Nick Hawes, and Bruno Lacerda. "Congestion-Aware Policy Synthesis for Multirobot Systems". In: *IEEE Transactions on Robotics* (2021)

[3] Charlie Street, Bruno Lacerda, Manuel Mühlig, and Nick Hawes. "Multi-Robot Planning Under Uncertainty with Congestion-Aware Models". In: *Proceedings of the 19th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*. 2020