Charlie Street

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Research

NEEDS UPDATE: I am a postdoctoral research assistant in the Goal-Oriented Autonomous Long-Lived Systems (GOALS) Lab at the Oxford Robotics Institute, University of Oxford. My current 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

- Planning Under Uncertainty
- Multi-Robot Coordination
- Formal Methods for Robotics
- Continuous-Time and Non-Stationary Planning Models

Research Positions

- **University of Birmingham** **Jan 2023 - Present**
  - Research Fellow
- **Oxford Robotics Institute, University of Oxford** **July 2022 - Dec 2022**
  - Postdoctoral Research Assistant in AI for Autonomous Systems

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
- **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 IBM Team Project Prize 2015/16
  - Awarded BCS Prize for Best in Year 2014/15

Projects

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

Supervision

PhD Students

- **Weijian Zhang (with Masoumeh Mansouri)** **2023-Present**
  - Topic: *Human-Aware Formation Control for Multi-Robot Systems*

Final 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] Bruno Lacerda, Anna Gautier, Alex Rutherford, Alex Stephens, Charlie Street, and Nick Hawes. "Decision-Making under Uncertainty for Multi-Robot Systems". In: *AI Communications* 35.4 (2022), pp. 433–441.

[2] 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.

[3] Charlie Street, Sebastian Pütz, Manuel Mühlig, Nick Hawes, and Bruno Lacerda. "Congestion-Aware Policy Synthesis for Multirobot Systems". In: *IEEE Transactions on Robotics* 38.1 (2022), pp. 262–280.

[4] 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.

Reviewing

- **Journal Reviewing:** IEEE Transactions on Robotics (T-RO); IEEE Robotics and Automation Leters (RA-L).
- **Conference Programme Committee:** AAAI Conference on Artificial Intelligence (AAAI) - 2023; International Conference on Autonomous Agents and Multiagent Systems (AAMAS) - 2023; Robotics: Science and Systems (RSS) - 2023 (check RSS 2023 is PC not just review).
- **Conference Reviewing:** AAAI Conference on Artificial Intelligence (AAAI) - 2020; International Conference on Autonomous Agents and Multiagent Systems (AAMAS) - 2020, 2021; International Joint Conference on Artificial Intelligence (IJCAI) - 2019; International Conference on Automated Planning and Scheduling (ICAPS) - 2020-2022; Conference on Neural Information Processing Systems (NeurIPS) - 2020, 2021; IEEE International Conference on Robotics and Automation (ICRA) - 2020; IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) - 2021-2022; International Conference on Principles of Knowledge Representation and Reasoning (KR) - 2021; European Conference on Mobile Robots (ECMR) - 2019; Advances in Cognitive Systems - 2020.
- **Workshop Programme Committee:** Workshop on Planning and Robotics (PlanRob) @ ICAPS 2023.

Talks

- **Tutorial on Multi-Robot Planning Under Uncertainty at AAMAS 2023**