

Senior Researcher in Robotics
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ABOUT ME

I am currently a Senior Researcher in Robotics at the Goal-Oriented Long-Lived Systems (GOALS) Lab, Oxford Robotics Institute, University of Oxford. My research focuses on the intersection of decision making under uncertainty, formal methods and mobile robotics. In particular, I am interested on the use of a combination of techniques from learning, planning and model checking to synthesise intelligent, robust and verifiable behaviour, both for single and for multi-robot systems.

Research Interests

- Sequential Decision Making under Uncertainty
- Probabilistic Model Checking
- Planning for Robotics
- Multi-Robot Coordination
- Service Robotics
- Discrete Event Systems

EDUCATION

Instituto Superior Técnico, Lisbon, Portugal

- **PhD in Electrical and Computer Engineering** 2009–2013
Thesis: Supervision of Discrete Event Systems Based on Temporal Logic Specifications
Advisor: Pedro U. Lima
- **MSc in Mathematics and Applications** 2002–2007
Thesis: Linear-Time Temporal Logic Control of Discrete Event Systems
Advisors: Pedro U. Lima, Francisco M. Dionísio
- **BSc in Applied Mathematics and Computation** 2002–2007

RESEARCH POSITIONS

Oxford Robotics Institute, University of Oxford, Oxford, UK

- Senior Researcher in Robotics September 2018 – Present
- Postdoctoral Research Assistant in Robotics September 2017 – September 2018

University of Birmingham, Birmingham, UK

- Postdoctoral Research Fellow in Intelligent Robotics April 2013 – September 2017

Örebro University, Örebro, Sweden

- Research Intern September 2008 – December 2008

Instituto Superior Técnico, Lisbon, Portugal

- Research Intern March 2008 – August 2008

CONTRIBUTION TO PROJECTS

University of Oxford

- Offshore Robotics for Certification of Assets (ORCA). UK Research and Innovation

- Robotics and Artificial Intelligence for Nuclear (RAIN). UK Research and Innovation

University of Birmingham

- Spatio-Temporal Representations and Activities for Cognitive Control in Long-Term Scenarios (STRANDS). EU-FP7
- Novel Dynamic Vehicle Scheduling and Path Planning Algorithms for Mobile Robotic and AGV Warehouse Order Picking. TSB Smart Award
- Learning the Structure and Dynamics of Human Environments to Support Intelligent Mobile Robot Behaviour. EPSRC First Grant

TEACHING

University of Oxford

- Lecturer: Probabilistic Model Checking Michaelmas Term 2018
Shared lecturing duties with Marta Kwiatkowska

University of Birmingham

- Invited Lectures: Robot Programming Semester 2 2015/2016, 2016/2017
Delivered two lectures each year on multi-robot coordination
- Lecturer: Intelligent Robotics Semester 1 2014/2015
Shared lecturing duties with Chris Burbidge and Lars Kunze
- Invited Research Lecture: Intelligent Robotics Semester 1 2013/2014
- Demonstrator: Foundations of Computer Science Semester 1 2013/2014

STUDENT SUPERVISION

University of Oxford

- PhD Co-Supervisor (w/ Nick Hawes): Charlie Street September 2018 – Present
Topic: AI for Multi-Robot Systems
- PhD Co-Supervisor (w/ Nick Hawes): Marc Rigter September 2018 – Present
Topic: Shared Autonomy with Formal Guarantees
- PhD Co-Supervisor (w/ Nick Hawes): Michael Painter September 2018 – Present
Topic: Multi-Objective Mission Planning
- 4th Year Project Supervisor: Han Zhou October 2018 – Present
Topic: Auctioning for Multi-Robot Coordination

University of Birmingham

- PhD Co-Supervisor (w/ David Parker and Nick Hawes): Fatma Faruq February 2017 – Present
Topic: Simultaneous Task Allocation and Planning under Uncertainty
- PhD Co-Supervisor (w/ Nick Hawes): Lenka Mudrova June 2014 – September 2017
Topic: Task Scheduling and Merging in Space and Time
- MSc Summer Project (w/ Jeremy Wyatt): Milan Tomy June 2017 – September 2017
Topic: Battery Scheduling in Autonomous Mobile Robots
- BSc Final Year Project (w/ Nick Hawes): Joseph Shaw October 2016 – April 2017
Topic: Auctioning for Multi-Robot Coordination
- MSc Summer Project (w/ Nick Hawes): Pedro Elias June 2015 – September 2015
Topic: Multi-agent Path Finding
- MSc Summer Project (w/ Nick Hawes): Eliot Dixon June 2014 – September 2014
Topic: MDP Models for Mobile Service Robots
- MSc Summer Project (w/ Nick Hawes): Ken Poyner June 2013 – September 2013
Topic: Autonomous Navigation Cost Estimation In Mobile Robots

RESEARCH VISITS

Delft University of Technology, Delft, The Netherlands

May 2016 – July 2016

- Host: Matthijs Spaan

University of California, Los Angeles, CA, USA

September 2011 – December 2011

- Host: Paulo Tabuada

University Carlos III de Madrid, Madrid, Spain

March 2010 – June 2010

- Host: Miguel A. Salichs

AWARDED FUNDING

LEaDing Fellows, a Marie Curie COFUND Programme

July 2018

2 Year Fellowship

- Research Proposal: “Cooperative Multi-Robot Transportation Systems with Guaranteed Quality of Service”
- Declined opportunity and stayed at University of Oxford

**LES & EPS PERCAT Career Development Competition,
University of Birmingham**

March 2016

- Travel support for research visit to TU Delft

**Ramsay Research Travel Fund, School of Computer Science,
University of Birmingham**

March 2016

- Subsistence support for research visit to TU Delft

Fundação para a Ciência e Tecnologia, Portugal

- Funding for PhD student research visit to UCLA

April 2011

- Funding for PhD student research visit to UC3M

November 2009

INVITED TALKS

- Workshop on Formal Methods in AI, University of Naples Federico II, Naples, Italy February 2017
- Computer Science Department Seminar Series, University of Liverpool, UK March 2017
- Robolog Workshop, IRISA, Rennes, France June 2017
- Full-day Tutorial at 4th Lucia PhD School on AI and Robotics, Lisbon, Portugal September 2017

SERVICE

University of Oxford

- Organiser of the Oxford Robotics Research Group Seminars
(w/ Siddharth Narayanaswamy) May 2018 – Present
- Engineering Research Associate at Pembroke College August 2018 – Present
- Participated in robot demo and Pembroke College Open Day June 2018
- Lead robot demo at Blenheim Palace, Woodstock, Oxfordshire January 2019

University of Birmingham

- Participated in several robot demos at various locations, e.g., London’s Museum of Natural History, Birmingham’s Think Tank, School of Computer Science and University of Birmingham’s Open Days 2014 – 2018

Reviewing

- Artificial Intelligence (AIJ)
- IEEE Transactions on Automatic Control (TACON)
- IEEE Robotics & Automation Magazine (RAM)
- Discrete Event Dynamic Systems (DEDS)
- IEEE Transactions on Automation Science and Engineering (T-ASE)
- IEEE Control Systems Letters (L-CSS)
- IEEE Transactions on Systems, Man, and Cybernetics (SMC)
- IEEE Transactions on Intelligent Systems (IS)
- International Joint Conference on Artificial Intelligence (IJCAI) - 2017 – 2019
- AAAI Conference on Artificial Intelligence (AAAI) - 2018, 2019
- International Conference on Autonomous Agents and Multiagent Systems (AAMAS) - 2014, 2016 – 2019
- International Conference on Automated Planning and Scheduling (ICAPS) - 2016 – 2019
- European Conference of Artificial Intelligence (ECAI) - 2016, 2018
- International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS) - 2017
- International Symposium on Distributed Autonomous Robotic Systems (DARS) - 2014
- IEEE International Conference on Robotics and Automation (ICRA) - 2015, 2018
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) - 2015 – 2018
- IEEE Conference on Decision and Control (CDC) - 2018
- American Control Conference (ACC) - 2016, 2018
- IEEE International Conference on Automation Science and Engineering (CASE) - 2015, 2016
- AAAI Spring Symposium on Integrating Representation, Reasoning, Learning, and Execution for Goal Directed Autonomy - 2018
- Introspective Methods for Reliable Autonomy Workshop @ IROS - 2017 Workshop on Autonomous Mobile Service Robots @ IJCAI - 2016
- AI for Long-term Autonomy Workshop @ ICRA - 2016
- Workshop on Autonomous Robots and Multirobot Systems @ AAMAS - 2016 Workshop on Artificial Intelligence and Robotics @ AAAI - 2014, 2016
- AAAI Robotics Fellowships - 2015, 2016

INDUSTRY POSITIONS

Everis, Consulting, IT, Outsourcing & Professional Services, Lisbon, Portugal

September 2007 - February 2008

- Junior Consultant

Mercer Human Resource Consulting, Lisbon, Portugal

April 2006 – September 2006

- Part-time Collaborator

PUBLICATIONS
