# Curriculum Vitae
## Bruno Lacerda

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RESEARCH INTERESTS

Planning under uncertainty,  probabilistic model checking, multi-robot systems, service robotics, temporal logics, discrete event systems.

RESEARCH POSITIONS

September 2017 - Present

*Postdoctoral Research Assistant in Robotics*
University of Oxford, Oxford, United Kingdom

April 2013 - September 2017

*Research Fellow in Intelligent Robotics*
University of Birmingham, Birmingham, United Kingdom
Contribution to Projects:
‣ 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:
‣ 2015/2016, 2016/2017, Semester 2: Two lectures on multi-robot coordination  for the Robot Programming module.
‣ 2014/2015, Semester 1: Part of the lecturer team for the Intelligent Robotics module.
‣ 2013/2014, Semester 1: Part of the demonstrator team for the Foundations of Computer Science module.
Phd Co-Supervision
‣ Lenka Mudrová. "

September 2008 - December 2008

*Research Grantee*
Örebro University, Örebro, Sweden
Contribution to Projects:
‣ Ecology of Physically Embedded Intelligent Systems.

March 2008 - August 2008

*Research Grantee*
Instituto Superior Técnico, Lisbon, Portugal
Development of translation tool between two xml representations of Petri nets.
Development of research agenda and proposal for PhD application.

EDUCATION

2009 - 2013

*Doutoramento (PhD) in Electrical and Computer Engineering (Pass with merit)*
Instituto Superior Técnico, Lisbon, Portugal
Thesis: *"Supervision of Discrete Event Systems Based on Temporal Logic Specifications".*
Advisor: Prof. Pedro U. Lima.

Research visits:
- ‣ 09/2011 - 12/2011: University of California at Los Angeles, Los Angeles, CA, USA, hosted by Prof. Paulo Tabuada.
- ‣ 03/2010 - 06/2010: Universidad Carlos III de Madrid, Madrid, Spain, hosted by Prof. Miguel A. Salichs.

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| 2002 - 2007 | *Mestrado (MSc) in Mathematics and Applications* |
| | Instituto Superior Técnico, Lisbon, Portugal |
| | Thesis: *"Linear-Time Temporal Logic Control of Discrete Event Systems".* |
| | Advisors: Prof. Pedro U. Lima, Prof. Francisco M. Dionísio. |
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| 2002 - 2007 | *Licenciatura (BSc) in Applied Mathematics and Computation* |
| | Instituto Superior Técnico, Lisbon, Portugal |

## AWARDED FUNDING

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| May 2016 - July 2016 | Research Visit to Delft University of Technology |
| | LES & EPS PERCAT Career Development Competition (University of Birmingham) - £400 (maximum awardable amount) |
| | Ramsay Research Travel Fund (School of Computer Science, University of Birmingham) - £1500 |
| September 2011 - December 2011 | Research Visit to University of California at Los Angeles |
| | Funding for PhD Student Visits Abroad (Fundação para a Ciência e Tecnologia) - €3065 |
| March 2010 - June 2010 | Research Visit to University Carlos III de Madrid |
| | Funding for PhD Student Visits Abroad (Fundação para a Ciência e Tecnologia) - €1735 |

## INVITED TALKS

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

## SERVICE TO THE COMMUNITY

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| Program Committee | International Joint Conference on Artificial Intelligence (IJCAI) - 2017, 2018 |
| | AAAI Conference on Artificial Intelligence (AAAI) - 2018 |
| | International Conference on Autonomous Agents and Multiagent Systems (AAMAS) - 2014, 2016, 2017, 2018 |
| | International Conference on Automated Planning and Scheduling (ICAPS) - 2016, 2017, 2018 |
| | European Conference of Artificial Intelligence (ECAI) - 2016, 2018 |
| | 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 |

AAAI Robotics Fellowships - 2015, 2016

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| Journal Reviewing | IEEE Transactions on Automatic Control (TACON) |
| | IEEE Robotics & Automation Magazine (RAM) |
| | 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) |
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| Conference Reviewing | International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS) |
| | International Symposium on Distributed Autonomous Robotic Systems (DARS) |
| | IEEE International Conference on Robotics and Automation (ICRA) |
| | IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) |
| | IEEE Conference on Decision and Control (CDC) |
| | American Control Conference (ACC) |
| | IEEE International Conference on Automation Science and Engineering (CASE) |

## INDUSTRY POSITIONS

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| September 2007 - February 2008 | *Junior Consultant* |
| | Everis, Consulting, IT, Outsourcing & Professional Services, Lisbon, Portugal |
| | Participation in the development of a Business Continuity Plan for an insurance carrier. |
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| April 2006 - September 2006 | *Part-time Collaborator* |
| | Mercer Human Resource Consulting, Lisbon, Portugal |
| | Development of a human resource management software tool. |

## PUBLICATIONS

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| Under Review | "Supervision of Petri Nets Based on Safe State/Event Linear Temporal Logic Specifications". Bruno Lacerda and Pedro U. Lima. *Submitted to IEEE Transactions on Automated Science and Engineering (T-ASE).* |
| | "Probabilistic planning with formal performance guarantees for mobile service robots". Bruno Lacerda, Fatma Faruq, David Parker and Nick Hawes. *Submitted to International Journal of Robotics Research (IJRR).* |

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| Journal Papers | [1] "The STRANDS Project: Long-Term Autonomy in Everyday Environments". Nick Hawes et al. *IEEE Robotics & Automation Magazine,* Vol. 24, No. 3, 2017. |
| | [2] "On the Notion of Uncontrollable Marking in Supervisory Control of Petri Nets". Bruno Lacerda and Pedro U. Lima. *IEEE Transactions on Automatic Control,* Vol. 59, No. 11, 2014. |
| | [3] "Linear-Time Temporal Logic Control of Discrete Event Models of Cooperative Robots". Bruno Lacerda and Pedro U. Lima. *Journal of Physical Agents*, Vol. 2, No. 1, 2008. |

Conference Papers

[4] "Multi-Objective Policy Generation for Mobile Robots Under Probabilistic Time-Bounded Guarantees". In *Proceedings of the 27th International Conference on Automated Planning and Scheduling (ICAPS)*, Pittsburgh, PA, USA, 2017.

[5] "Partial Order Temporal Plan Merging for Mobile Robot Tasks". Lenka Mudrová, Bruno Lacerda and Nick Hawes. In *Proceedings of the 22nd European Conference on Artificial Intelligence (ECAI)*, The Hague, Netherlands, 2016.

[6] "An Integrated Control Framework for Long-Term Autonomy in Mobile Service Robots". Lenka Mudrová, Bruno Lacerda and Nick Hawes. In *Proceedings of the 7th European Conference on Mobile Robotics (ECMR)*, Lincoln, UK, 2015.

[7] "Optimal Policy Generation for Partially Satisfiable Co-Safe LTL Specifications". Bruno Lacerda, David Parker and Nick Hawes. In *Proceedings of the 24th International Joint Conference on Artificial Intelligence (IJCAI)*, Buenos Aires, Argentina, 2015.

[8] "Now or later? Predicting and maximising success of navigation actions from long-term experience". Jaime P. Fentanes, Bruno Lacerda, Tomas Krajnik, Nick Hawes and Marc Hanheide. In *Proceedings of the 2015 IEEE International Conference on Robotics and Automation (ICRA)*, Seattle, WA, USA, 2015.

[9] "Optimal and dynamic planning for Markov decision processes with co-safe LTL specifications". Bruno Lacerda, David Parker and Nick Hawes. In *Proceedings of the 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Chicago, IL, USA, 2014.

[10] "LTL-Based Decentralized Supervisory Control of Multi-Robot Tasks Modelled as Petri Nets". Bruno Lacerda and Pedro U. Lima. In *Proceedings of the 2011 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, San Francisco, CA, USA, 2011.

[11] "Designing Petri Net Supervisors from LTL Specifications". Bruno Lacerda and Pedro U. Lima. In *Proceedings of the 2011 Robotics: Science and Systems Conference (RSS)*, Los Angeles, CA, USA, 2011.

[12] "Designing Petri Net Supervisors for Multi-Agent Systems from LTL Specifications (Extended Abstract)". Bruno Lacerda and Pedro U. Lima. In *Proceedings of the 10th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, Taipei, Taiwan, 2011.

[13] "Petri Net Based Supervisory Control of a Social Robot with LTL Specifications". Bruno Lacerda, Pedro U. Lima, Javi Gorostiza and Miguel A. Salichs. In *Proceedings of the 11th International Conference On Mobile Robots And Competitions*, Lisbon, Portugal, 2011.

[14] "Petri Nets as an Analysis Tool for Data Flow in Wireless Sensor Networks". Bruno Lacerda and Pedro U. Lima. In *Proceedings of the 1st Portuguese Conference on Wireless Sensor Networks (CNRS)*, Coimbra, Portugal, 2011.

Workshop Papers

[15] "Nested Value Iteration for Partially Satisfiable Co-Safe LTL Specifications (Extended Abstract)". Bruno Lacerda, David Parker and Nick Hawes. In *Proceedings of the AAAI Fall Symposium on Sequential Decision Making for Intelligent Agents (SDMIA)*, Arlington, Virginia, USA, 2015.

[16] "Optimal Motion Planning for Markov Decision Processes with Co-Safe Linear Temporal Logic Specifications". Bruno Lacerda, David Parker and Nick Hawes. In

*Proceedings of the 31st Workshop of the UK Planning & Scheduling Special Interest Group (PlanSIG)*, Edinburgh, UK, 2014.

[17] "LTL Plan Specification for Robotic Tasks Modelled as Finite State Automata". Bruno Lacerda and Pedro U. Lima. In *Proceedings of the AAMAS '09 Workshop on Agent Design: Advancing from Practice to Theory (ADAPT)*, Budapest, Hungary, 2009.