

Dr. Andreas Orthey

Computational Robotics

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CONTACT

Max Planck Institute for Intelligent Systems, Heisenbergstr. 3, 70569 Stuttgart

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EDUCATION

Doctor of Philosophy (PhD)

December 2015

National Polytechnic Institute of Toulouse

Computer Science

Master of Science (MSc)

September 2012

Technical University of Berlin

(Grade: 1.2*, with Honours)

Computational Engineering

Bachelor of Science (BSc)

January 2011

Technical University of Berlin

(Grade: 2.2*)

Computational Engineering

*German Grading System: 1.0 - 1.5 / very good, 1.6 - 2.5 / good, 2.6 - 3.5 / satisfactory, 3.6 - 4.0 / sufficient

ACADEMIC EMPLOYMENT

Postdoctoral Researcher

December 2019 – present

Max-Planck Institute for Intelligent Systems (MPI-IS)

Stuttgart, Germany

Research Fellow

December 2018 – November 2019

Fellowship (1 year) from the Alexander von Humboldt Foundation (AvH)

University of Stuttgart

Stuttgart, Germany

Research Fellow

November 2016 – October 2018

Fellowship (2 years) from the Japan Society for the Promotion of Science (JSPS)

National Institute of Advanced Industrial Science and Technology (AIST)

Tsukuba, Japan

Postdoctoral Researcher

October 2015 – September 2016

Worcester Polytechnic Institute (WPI)

Worcester, MA, USA

Doctoral Candidate*October 2012 – September 2015*

Laboratory for Analysis and Architecture of Systems (LAAS-CNRS)
Toulouse, France

Doctoral Fellow*September 2014 – November 2014*

Fellowship (3 months) from École Doctorale Systèmes (EDSYS)
University of Edinburgh
Edinburgh, United Kingdom

GRANTS AND AWARDS

Fellowship from the Alexander von Humboldt Foundation (AvH) [~47'000 EUR]	2018
Fellowship from the Japan Society for the Promotion of Science (JSPS) [~92'000 EUR]	2016
Doctoral School Mobility Grant (EDSYS aide à la mobilité internationale) [~4'000 EUR]	2014
Doctoral Grant from the French Ministry of National Education [~60'000 EUR]	2012
Graduated Top of Class TU Berlin	2012

PUBLICATIONS (UNDER REVIEW)

- [14] **A Orthey**, Marc Toussaint, *Sparse Multilevel Roadmaps on Fiber Bundles for High-Dimensional Motion Planning*, International Conference on Robotics and Automation (ICRA), 2020
- [13] **A Orthey**, Marc Toussaint, *Section Patterns: Efficiently Solving Narrow Passage Problems using Multilevel Motion Planning*, Transactions on Robotics (TRO), 2020 [**Journal**]
- [12] **A Orthey**, Sohaib Akbar, Marc Toussaint, *Multilevel Motion Planning: A Fiber Bundle Formulation*, International Journal of Robotics Research (IJRR), 2020 [**Journal**]
- [11] Marie-Therese Khoury, **A Orthey**, Marc Toussaint, *Efficient Sampling of Transition Constraints for Motion Planning under Sliding Contacts*, International Conference on Robotics and Automation (ICRA), 2020

PUBLICATIONS (PEER-REVIEWED)

- [10] **A Orthey**, M Toussaint, *Visualizing Local Minima in Multi-Robot Motion Planning using Multilevel Morse Theory*, Workshop on the Algorithmic Foundations of Robotics (WAFR), 2020
- [9] **A Orthey**, B Frész, M Toussaint, *Motion Planning Explorer: Visualizing Local Minima using a Local-Minima Tree*, Robotics and Automation Letters (RA-L), 5(2), 346-353, April, 2020, *Selected for Presentation at ICRA 2020* [**Journal**]
- [8] **A Orthey**, M Toussaint, *Rapidly-Exploring Quotient-Space Trees: Motion Planning using Sequential Simplifications*, International Symposium on Robotics Research (ISRR), 2019
- [7] **A Orthey**, O Roussel, O Stasse, M Taix, *Motion Planning in Irreducible Path Spaces*, Robotics and Autonomous Systems (RAS), 109, 97-108, November, 2018 [**Journal**]
- [6] **A Orthey**, A Escande, E Yoshida, *Quotient-Space Motion Planning*, International Conference on Intelligent Robots and Systems (IROS), 2018
- [5] **A Orthey**, O Stasse, F Lamiriaux, *Motion Planning and Irreducible Trajectories*, International Conference on Robotics and Automation (ICRA), 2015

- [4] D Katz, **A Orthey**, O Brock, *Interactive perception of articulated objects*, Experimental Robotics (Springer Tracts in Advanced Robotics), 301-315, 2014 [**Book Chapter**]
- [3] O Stasse, **A Orthey**, F Morsillo, M Geisert, N Mansard, M Naveau, C Vassallo, *Airbus/future of aircraft factory HRP-2 as universal worker proof of concept*, IEEE-RAS International Conference on Humanoid Robots (Humanoids), 2014
- [2] **A Orthey**, O Stasse, *Towards reactive whole-body motion planning in cluttered environments by precomputing feasible motion spaces*, IEEE-RAS International Conference on Humanoid Robots (Humanoids), 2013
- [1] **A Orthey**, M Toussaint, N Jetchev, *Optimizing Motion Primitives to Make Symbolic Models More Predictive*, International Conference on Robotics and Automation (ICRA), 2013

THESES

- [3] **A Orthey**, *Exploiting structure in humanoid motion planning*, Ph.D Thesis, INP Toulouse, 2015
- [2] **A Orthey**, *Optimizing Motion Primitives to Integrate Symbolic and Motion Planning*, M.Sc. Thesis, Berlin Institute of Technology, 2012
- [1] **A Orthey**, *Three dimensional Joint Detection*, B.Sc. Thesis, Berlin Institute of Technology, 2010

THESES SUPERVISED

- [5] Marie-Therese Khoury, *Efficient Sampling of Transition Constraints for Motion Planning under Sliding Contacts*, B.Sc. Thesis, University of Stuttgart, 2020
- [4] Alexander Harner, *Method to Optimize and Enumerate Local Minima in Probabilistic Roadmaps (In German)*, B.Sc. Thesis, University of Stuttgart, 2020
- [3] Azer Messaoudi, *An Optimization Algorithm for Dynamical Systems under Non-holonomic Constraints*, B.Sc. Thesis, University of Stuttgart, 2020
- [2] Sohaib Akbar, *Sparse and Optimal Planning Algorithms for Multilevel Motion Planning*, M.Sc. Thesis, University of Stuttgart, 2020
- [1] Benjamin Frész, *Visualization of Holonomic and Non-Holonomic Planning Problems*, B.Sc. Thesis, University of Stuttgart, 2019

INVITED TALKS AND SPOTLIGHT TALKS

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| [13] <i>Rapidly-Exploring Quotient-Space Trees</i> [Spotlight, Poster]
ISRR Symposium, Sofitel Legend Metropole Hanoi, Hanoi, Vietnam | 07/10/2019 |
| [12] <i>Making Robotic Algorithms Transparent and Interactive</i> [Spotlight, Poster]
BRAGFOT, Hotel Schreiberhof, Munich, Germany | 06/09/2019 |
| [11] <i>As a postdoc abroad - Experiences from two years Japan (in German)</i>
Networking Event (AvH), Maritim Hotel, Bonn, Germany | 18/11/2018 |
| [10] <i>Simplification of High-Dimensional Spaces</i>
Humanoid Robots Lab, University of Bonn, Bonn, Germany | 16/11/2018 |
| [9] <i>Quotient-Space Motion Planning</i> [Spotlight, Poster]
IROS Conference, Madrid Municipal Conference Centre, Madrid, Spain | 04/10/2018 |

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| [8] <i>Life of a Robotics Researcher</i> | 12/06/2018 |
| JSPS Science Dialog, Takezono Highschool, Tsukuba, Japan | |
| [7] <i>Quotient-Space Motion Planning</i> | 15/05/2018 |
| Movement Generation and Control Group, Max-Planck Institute, Tübingen, Germany | |
| [6] <i>Making Ideas Stick</i> | 26/02/2018 |
| JSPS Orientation, Hotel Moterey Hanzomon, Tokyo, Japan | |
| [5] <i>Robotics, Motion Planning and Topology</i> | 02/10/2016 |
| Networking Event (AvH), Albert Ludwig University of Freiburg, Freiburg, Germany | |
| [4] <i>Dimensionality Reduction in Motion Planning</i> | 24/02/2016 |
| Lecture, Worcester Polytechnic Institute, Worcester, MA, USA | |
| [3] <i>Motion Planning and Irreducible Trajectories</i> [Spotlight, Poster] | 28/05/2015 |
| ICRA Conference, Washington State Convention Center, Seattle, WA, USA | |
| [2] <i>Irreducible Trajectories and Homotopy Motion Planning</i> | 12/02/2015 |
| Robot Locomotion Group, Massachusetts Institute of Technology, Cambridge, MA, USA | |
| [1] <i>Towards Reactive Whole-Body Motion Planning in Cluttered Environments</i> | 29/10/2013 |
| Humanoids Conference, Historic Academy of Medicine, Atlanta, GA, USA | |

OTHER ACADEMIC MERITS

Contributor to the Open Motion Planning Library (OMPL)

Member of German Society of Humboldtians (Deutsche Gesellschaft der Humboldtianer e.V.)

Member of German JSPS Alumni Association

Member of Institute of Electrical and Electronics Engineers (IEEE)

Scientific Reviewer

IEEE International Conference on Intelligent Robots and Systems (IROS) 2013-2016, 2018-2020

IEEE International Conference on Robotics and Automation (ICRA) 2013, 2014, 2019, 2020

IEEE International Conference on Humanoid Robots (Humanoids) 2013, 2015

IEEE Transactions on Automation Science and Engineering (T-ASE) 2016

IEEE Robotics and Automation Letters (RA-L) 2019, 2020

Transactions on Robotics (T-RO) 2019

Workshop on the Algorithmic Foundations of Robotics (WAFR) 2016

International Symposium on Robotics Research (ISRR) 2019, 2020

Robotics: Science and Systems (RSS) 2016, 2019

Electronics 2018

LANGUAGE SKILLS

German	Mother Tongue
English	C2
French	B2