

# Tobias Kunz

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## Education

- Georgia Institute of Technology, Atlanta, GA** 8/2009 - expected 5/2015  
Ph.D. Candidate in Robotics with a minor in Optimization  
*Thesis: "Time-Optimal Sampling-based Motion Planning for Manipulators with Acceleration Limits"*  
Advisors: Prof. Henrik Christensen, Prof. Mike Stilman
- Georgia Institute of Technology, Atlanta, GA** 8/2007 - 8/2008  
M.Sc. in Computer Science (GPA: 3.9/4.0)
- University of Stuttgart, Germany** 10/2004 - 8/2009  
Diplom ( $\approx$  B.Sc.+M.Sc.) in Computer Science with a minor in Engineering Cybernetics  
Specialization areas: Intelligent Systems, Distributed Systems (German grade: 1.4)

## Research Experience

- Georgia Institute of Technology, Humanoid Robotics Lab, Atlanta, GA** 8/2009 - present  
Graduate Research Assistant
- Conducted research on motion planning for manipulators involving dynamic, real-time and/or task constraints.
  - Led part of the development team of DART (<http://dartsim.github.io/>), a simulator for articulated dynamics for use in robotics and animation.
- Waseda University, Takanishi Lab, Tokyo, Japan** 6/2011 - 8/2011  
Visiting Researcher  
*Developed a motion planner for the arm of the WABIAN-2 humanoid robot.*
- Fraunhofer IPA, Stuttgart, Germany** 1/2009 - 8/2009  
*Diplom Thesis: "Real-Time Motion Planning for a Robot Arm in Dynamic Environments"*  
Advisor: Ulrich Reiser

## Industry Experience

- Willow Garage, Inc., Menlo Park, CA** 6/2012 - 8/2012  
Research Intern, Mentor: Dr. Sachin Chitta  
*Enabled the PR2 robot to quickly transport objects on a tray without them slipping off using trajectory optimization.*
- ITVT GmbH, Leonberg, Germany** 6/2001 - 7/2007  
Software Developer, part-time  
*Developed customizations for Microsoft Dynamics CRM using C# and ASP.NET.*  
Microsoft Certified Professional 5/2005

## Teaching Experience

- Georgia Institute of Technology, School of Interactive Computing, Atlanta, GA** 8/2009 - 12/2009  
Graduate Teaching Assistant, Knowledge-Based Artificial Intelligence (Prof. Ashok Goel)

## Honors

- JSPS Summer Fellowship, Japan Society for the Promotion of Science 6/2011 - 8/2011  
Tuition waiver based on academic excellence (top 5%), University of Stuttgart 9/2008 - 8/2009  
Scholarship of the German Academic Exchange Service (DAAD) 9/2007 - 5/2008

## Leadership

- President of the World Student Fund Exchange Club at Georgia Tech 8/2009 - 8/2010

## ***Publications***

- T. Kunz, M. Stilman. *Probabilistically Complete Kinodynamic Planning for Robot Manipulators with Acceleration Limits*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2014.
- T. Kunz, M. Stilman. *Kinodynamic RRTs with Fixed Time Step and Best-Input Extension Are Not Probabilistically Complete*. International Workshop on the Algorithmic Foundations of Robotics (WAFR), 2014.
- A. H. Quispe, T. Kunz, M. Stilman. *Generation of Diverse Paths in 3D Environments*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2013.
- T. Kunz, M. Stilman. *Manipulation Planning with Soft Task Constraints*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2012.
- T. Kunz, M. Stilman. *Time-Optimal Trajectory Generation for Path Following with Bounded Acceleration and Velocity*. Robotics: Science and Systems (RSS), 2012.
- T. Kunz, P. Kingston, M. Stilman, M. Egerstedt. *Dynamic Chess: Strategic Planning for Robot Motion*. IEEE International Conference on Robotics and Automation (ICRA), 2011.
- T. Kunz, U. Reiser, M. Stilman, A. Verl. *Real-Time Path Planning for a Robot Arm in Changing Environments*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2010.
- K. Teeyapan, J. Wang, T. Kunz, and M. Stilman. *Robot Limbo: Optimized planning and control for dynamically stable robots under vertical obstacles*. IEEE International Conference on Robotics and Automation (ICRA), 2010.