Grey

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EDUCATION

2011—2017	**Georgia Institute of Technology** Ph.D. in Robotics *Advised by: C. Karen Liu, Aaron Ames, and Mike Stilman*
2007—2011	**University of Illinois at Urbana-Champaign** B.Sc. in Aerospace Engineering

RESEARCH INTERESTS

Humanoid/Mobile Robotics: Locomanipulation Planning, Dynamics, Controls, Teleoperation

Software Systems: Reliability, Robustness, Maintainability, Visualization, User-friendliness

EMPLOYMENT & RESEARCH

2017—Current	*Open Robotics* (Software Engineer) **Physics Simulation and Robotics Software**. Developing open source software to facilitate robotics research and development, with an emphasis on physical simulation and robot control.
2015—2017	*Graphics Lab & AMBER Lab* (Graduate Research Assistant) **Humanoid Robot Motion Planning**. Developing algorithms to efficiently perform locomotion and manipulation planning for humanoid robotic platforms.
2011—2015	*Humanoid Robotics Lab* (Graduate Research Assistant) **Humanoid Robot Teleoperation**. Developed software systems to allow human users to teleoperate humanoid robots to perform complex tasks which reflect the needs of various disaster scenarios.
2012—2014	*Team DRC-Hubo* (Graduate Research Assistant) **DARPA Robotics Challenge Trails**. Worked on a multi-institute team to participate in a DARPA-sponsored competition. Helped to develop and maintain core software systems at all levels of the teleoperation pipeline, and co-piloted several of the DRC tasks.

2010—2011	*Aerospace Robotics and Control Lab* (Undergrad Research Assistant) **Swarm Control Testbed**. Designed and implemented a closed-loop hardware testbed for examining control algorithms on autonomous flying swarms and small-scale model aircraft.

TECHNICAL SKILLS

Programming Languages: C++ (Primary Language), Python, Matlab, Java

Operating Systems: Ubuntu (Primary OS) and Windows

Version Control: Git (Primarily) and SVN

Robotics Software Tools: DART, Gazebo, ROS, Eigen (C++), FCL, FLANN, Ach, 3D CAD

General Software Tools: CMake, Qt, OpenSceneGraph, gdb, any open source C++/Python tools

PROFESSENIONAL ACTIVITIES

Open-Source Software:
- DART: Contributor, co-maintainer, and project co-director
- Gazebo: Contributor and co-maintainer
- ROS/ROS2: Contributor and co-maintainer
- hubo-ach: Former contributor and co-maintainer
- HuboCan: Creator, designer, and maintainer

Invited Speaker:
- *Humanoid Robotics: Ongoing Challenges and Future Prospects*. Swarthmore College, March 2017.
- *DART 5.0.* An overview of the features of DART v5.0 and future directions for ongoing development. Carnegie Mellon University, May 2015.

Conference Reviewer:
- Robotics: Science and Systems Conference (RSS)
- IEEE-RAS Int'l Conference on Humanoid Robotics (Humanoids)
- IEEE/RSJ Int'l Conference on Intelligent Robots and Systems (IROS)

TEACHING EXPERIENCE

2013—2014   **Teaching Assistant**
Humanoid Robotics, Georgia Tech. Multidisciplinary project-oriented class which introduced students to the fundamentals of planning, control, and operation for humanoid robotics platforms. In addition to providing technical assistance to the students, I taught a series of voluntary "crash courses" for students who lacked some of the necessary technical background for the class.

2010—2011   **Tutor**
Aerospace Department, UIUC. Assisted fellow aerospace undergrads with technical courses, both fundamental and domain-specific. This position was sponsored by the Aerospace Department.

PUBLICATIONS

Journal Article:

[1] Matt Zucker, Sungmoon Joo, Michael X. Grey, Christopher Rasmussen, Eric Huang, Mike Stilman, and Aaron Bobick. A General Purpose System for Teleoperation of the DRC-HUBO Humanoid Robot. *Journal of Field Robotics*, 32(3):336—351, 2015.

Refereed International Conferences:

[2] Michael X. Grey, Aaron D. Ames, and C. Karen Liu. Footstep and Motion Planning in Semi-unstructured Environments Using Randomized Possibility Graphs. *IEEE Int'l Conf. on Robotics and Automation (ICRA)*, 2017.

[3] Michael X. Grey, Caelan R. Garrett, C. Karen Liu, Aaron D. Ames, and Andrea L. Thomaz. Humanoid Manipulation Planning using Backward-Forward Search. *IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems (IROS)*, 2016, pp. 5467—5473.

[4] Christian M. Hubicki, Ayonga Hereid, Michael X. Grey, Andrea L. Thomaz, and Aaron D. Ames. Work those Arms: Toward Dynamic and Stable Humanoid Walking that Optimizes Full-Body Motion. *IEEE Int'l Conf. on Robotics and Automation (ICRA)*, 2016, pp. 1552—1559.

[5] Michael X. Grey, Sungmoon Joo, and Matt Zucker. Planning Heavy Lifts for Humanoid Robots. *IEEE-RAS Int'l Conf. on Humanoid Robotics*, 2014, pp. 640—645.

[6] Jingru Luo, Yajia Zhang, Kris Hauser, H. Andy Park, Manas Paldhe, C. S. George Lee, Michael X. Grey, Mike Stilman, Jun Ho Oh, Jungho Lee, Inhyeok Kim, and Paul Oh.

Robust Ladder-Climbing with a Humanoid Robot with Application to the DARPA Robotics Challenge. *IEEE Int'l Conf. on Robotics and Automation (ICRA)*, 2014, pp. 2792—2798.

[7] Rowland O'Flaherty, Peter Vieira, Michael X. Grey, Paul Oh, Aaron Bobick, Magnus Egerstedt, and Mike Stilman. Humanoid Robot Teleoperation for Tasks with Power Tools. *IEEE Int'l Conf. on Tech. for Practical Robot Applications (TEPRA)*, 2013.

[8] Michael X. Grey, Neil Dantam, Daniel M. Lofaro, Aaron Bobick, Magnus Egerstedt, Paul Oh, and Mike Stilman. Multi-Process Control Software for HUBO2 Plus Robot. *IEEE Int'l Conf. on Tech. for Practical Robot Applications (TEPRA)*, 2013.