



RESEARCH INTERESTS

Motion planning, control theory, and reinforcement learning as applied to autonomous systems, particularly for humanoid robots in challenging dynamic tasks such as whole-body manipulation and bipedal locomotion

EDUCATION

PhD in Robotics

August 2015

Carnegie Mellon University, Robotics Institute, Pittsburgh, PA

- Dissertation: Numerical Nonlinear Robust Control with Applications to Humanoid Robots
- Thesis committee: Christopher G. Atkeson (Chair, CMU Robotics), Koushil Sreenath (CMU MechE),
- Bruno Sinopoli (CMU ECE), and Stefan Schaal (University of Southern California ECE)

Master of Science in Robotics

August 2014

Carnegie Mellon University, Robotics Institute, Pittsburgh, PA

Master of Science in Mechanical Engineering

May 2010

Georgia Institute of Technology, School of Mechanical Engineering, Atlanta, GA

Master of Science in Electrical and Computer Engineering

May 2009

Georgia Institute of Technology, School of Electrical & Computer Engineering, Atlanta, GA

Bachelor of Science in Computer Science

May 2008

Georgia Institute of Technology, School of Computer Science, Atlanta, GA

Bachelor of Science in Electrical Engineering

May 2008

Georgia Institute of Technology, School of Electrical & Computer Engineering, Atlanta, GA

WORK EXPERIENCE

Senior Research Scientist

August 2015 - Present

Special Projects Group, Apple Inc

- This work is covered by a strict public release policy

Research Assistant to Prof. Christopher G Atkeson

August 2010 - August 2015

Robotics Institute, Carnegie Mellon University

- Developed algorithms for nonlinear trajectory optimization and receding-horizon control under uncertainty
- Implemented motion planning and control for bipedal humanoid robots to perform challenging dynamic tasks
- Contributed to the DARPA Maximum Mobility and Manipulation (M3) and DARPA Robotics Challenge (2015)
- Awarded the U.S. National Science Foundation Graduate Research Fellowship (2010-2013)
- Awarded Best Paper in Session - American Control Conference (2012), Montreal, Canada

Teaching Assistant to Prof. Hartmut Geyer

January 2013 - May 2013

Robotics Institute, Carnegie Mellon University

- 16-711: Kinematics, Dynamic Systems, and Control, part of the core curriculum in the Robotics PhD program
- Advised 49 students on assignments and final term project during weekly office hours
- End of term evaluation indicated "excellent" knowledge of course material and "thorough and fair" grading

Research Assistant to Prof. Mike Stilman

August 2009 - May 2010

Institute for Robotics and Intelligent Machines, Georgia Institute of Technology

- Investigated the full-body motion planning and control of wheeled humanoid robots to achieve dynamic gaits
- Designed and constructed a wheeled, dual arm humanoid robot under a budget of US\$600,000
- Contributed to the development of a cross-platform, open-source, simulator for articulated rigid body systems
- Best Paper Award Finalist: IEEE Int. Conf. on Humanoid Robots (2009) and SAIC Student Paper Competition (2009)

Research Assistant to Prof. Magnus Egerstedt and Prof. Ayanna Howard
School of Electrical & Computer Engineering, Georgia Institute of Technology

May 2007 - May 2009

- Developed a robotic sensor network to enable a NASA study on the effects of warming on the Antarctic ice shelves
- Designed decentralized, graph-theoretic algorithms for multi-robot task assignment and formation assembly
- Implemented decentralized control laws on a multi-robot system based on a prototype iRobot mobile platform
- Awarded the President's Undergraduate Research Award (2007)

Research Assistant to Prof. Tucker Balch
School of Interactive Computing, Georgia Institute of Technology

August 2006 - May 2007

- Developed a visual odometry system for Georgia Tech's entry to the 2007 DARPA Urban Challenge (semi-finalist)
- Designed and constructed a wheeled search and rescue robot based on the Robotix Dynamixel servos
- Participated in the 2007 RoboCup Rescue with Heavy Metal, a 300lb wheeled robot (largest in the competition)
- Served on the Student Advisory Board for Undergraduate Research

OTHER EXPERIENCE

Freelance Photographer

2004 - Present

- Specialized in landscape photography with an award-winning series on historical monuments in Europe
- Awarded 7th place in the largest photography competition in the world (353,768 entries, Guinness World Records)
- Exhibited in the Netherlands, Russia, Panama, Britain, Sweden, Spain, Philippines, Hong Kong, and Germany

Wikipedia Contributor

2008 - 2012

- Contributed content for Wikipedia in the areas of science and engineering, particularly WikiProject Robotics
- Contributed 129 original technical articles with an edit count of 5,651 (as of 2012)
- 15 original articles were featured on the Wikipedia homepage under the "Did you know..." with high readership

Reviewer / Volunteer

2008 - Present

- Served as reviewer for journals: IEEE-TEC, IEEE-TRO, IEEE-RAM, IJRR, Autonomous Robots, and Robotica
- Served as reviewer for conferences: ICRA, IROS, ICHR, ACC, CDC, MSC, ICML, NIPS, AAAI, IJCAI
- Served as student volunteer for RSS (2007) and webmaster for HSCC (2008)
- Member of IEEE Robotics and Automation Society and IEEE Controls Systems Society

CERTIFICATIONS

Bloomberg Certification in Equity, Fixed Income, Commodity, and FX
Bloomberg, L.P.

March 2014

Amateur Radio License (Element 3 – General Class, FRN #0018468694, KJ4JEQ)
Federal Communications Commission

January 2009

ABET Engineer-In-Training (EIT) Certification in Electrical Engineering (License: EIT023572)
Georgia State Board of Registration for Engineer and Land Surveyor

June 2008

SKILLS

- Proficient in C, C++, Java; Familiar with Objective-C, Python, and Swift
- Proficient in numerical computing tools: MATLAB and Mathematica. Familiar with: Boost, Eigen, GSL, LAPACK++
- Proficient in optimization tools: Gurobi, IPOPT, JuliaOpt, KNITRO, NPSOL, Google OR-Tools, and SNOPT
- Proficient in multi-body dynamics frameworks: Bullet, CarMaker, CarSim, Chrono, DART, MuJoCo, ODE
- Proficient in robotics frameworks: ROS, Player/Stage/Gazebo, Cartographer, MoveIt!, OpenCV, and OMPL
- Proficient with version control systems: Git, Mercurial, and SVN
- Basic knowledge of machine learning frameworks: Caffe, TensorFlow, and Theano
- Basic knowledge of 2D/3D modeling tools: AutoCAD, SolidWorks, SolidEdge, and Pro/ENGINEER
- Basic knowledge of electrical design and instrumentation tools: LabVIEW, MultiSim, and OrCAD

PERSONAL

- Citizenship: People's Republic of China
- U.S. Permanent Resident (since 2005), authorized to work in the U.S. without restrictions
- Languages: Chinese (native), English (native)