Mark Cutler | markjcutler.com

284 Vassar St. Apt G5 – Cambridge, MA 02139
✉ markjcutler@gmail.com

Education

Massachusetts Institute of Technology — **Cambridge MA**
PhD, GPA – 4.7/5.0 — *2012–2015*
Robotics and Autonomous Systems

Massachusetts Institute of Technology — **Cambridge MA**
MS, GPA – 4.7/5.0 — *2010–2012*
Aeronautical and Astronautical Engineering

Brigham Young University — **Provo UT**
BS, GPA – 3.99/4.0 — *2004–2005, 2007–2010*
Mechanical Engineering

Dissertation

Title: *Practical Robot Reinforcement Learning through Efficient Simulator Sampling*

Committee: Jonathan P. How (chair), Leslie Kaelbling, Andrea Censi

Description: Designing efficient algorithms for decision making under uncertainty for autonomous systems. Efficiency comes by properly incorporating possibly inaccurate simulations of the system to be controlled.

Masters Thesis

Title: *Design and Control of an Autonomous Variable-Pitch Quadrotor Helicopter*

Advisor: Jonathan P. How

Description: Designed, built, and programmed a novel autonomous multi-rotor helicopter capable of agile, aggressive, and aerobatic flight. Developed new flight control algorithms and autopilot hardware for the vehicle control.

Experience

Research

Aerospace Controls Lab, MIT — **Cambridge MA**
Research Assistant — *2010–2015*

- Programmed and maintained all the lab infrastructure code used for autonomous vehicle communication, control, estimation, planning, and visualization
- Designed, built, and soldered custom autopilots that currently operate all the lab vehicles
- Implemented lightweight, vision-based estimation code for relative navigation of quadrotors
- Developed a robust multi-vehicle path planning algorithm used for multi-vehicle missions

MAGICC Lab, BYU **Provo UT**
Undergraduate Research Assistant *2008–2010*

- Wrote wind estimation algorithms for small unmanned air-vehicles (UAVs)
- Developed atmospheric energy harvesting techniques for small UAVs to enhance their flight time, range, and mission capabilities
- Designed and built a three axis robot capable of mapping insect flapping patterns

Industry

SpotterRF **Orem UT**
Mechanical Design Engineer *2010–2010*

- Developed new heat management techniques for small radar devices resulting in a significant high-temperature performance improvement
- Designed a new carbon-fiber case for the radar encasement

L-3 Communications **Salt Lake City UT**
Mechanical Design Engineer *2009–2009*

- Designed demo platform for new modem integration into mobile communication ground station
- Performed thermal, structural, weight, and power analyses to optimize data link and modem case designs

Corning Inc. **Corning NY**
Advanced Machine Design Engineer *2008–2008*

- Researched and tested method that reduced tool run-out by 55% in contouring mills
- Designed mechanism enabling the cutting of ceramic extrusions to be performed by one person instead of two

Volunteer

Research Mentor **Cambridge MA**
Aerospace Controls Lab *2010–2014*

- Mentored several undergraduate researchers and senior projects in AeroAstro Engineering

The Church of Jesus Christ of Latter-day Saints **Rostov, Russia**
Volunteer Representative *2005–2007*

- Provided leadership, development and training for 16 volunteer representatives
- Oversaw volunteer operations in a geographical area covering over 300 miles

Awards

2010–2015: National Science Foundation Graduate Fellow

2010–2011: Aurora Flight Sciences Fellow

2009–2010: BYU Office of Research and Creative Activities Grant

2004–2010: Robert C. Byrd Honors Scholarship

Technical Highlights

Languages: C/C++, Python, Matlab, LaTeX, some HTML and CSS

Tools: ROS, Git, SVN, SolidWorks

Hardware: Embedded microcontroller development (Microchip and TI), Circuit design (2- and 4-layer boards), Soldering (including SMD leadless components), Basic machining (mill, lathe, 3D printing)

Professional Activities: Paper reviewer for

- International Journal of Robotics Research
- IEEE Transactions on Automation Science and Engineering
- IEEE Transactions on Control Systems Technology
- ASME Journal of Dynamic Systems, Measurement and Control
- IEEE Control Systems Magazine
- Automatica
- Robotics: Science and Systems
- IEEE International Conference on Robotics and Automation
- IEEE International Conference on Intelligent Robots and Systems
- IEEE Conference on Decision and Control
- American Control Conference
- International Conference on Unmanned Aircraft Systems
- European Control Conference
- IFAC Symposium on Automatic Control in Aerospace

Publications

Interests

- My Kids
- Electronics
- Skiing
- Robots
- Racquet Sports
- Ultimate Frisbee