

# Mark J. Cutler

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## EDUCATION

**Ph.D. Robotics and Autonomous Systems;** *MIT*; Cambridge, MA 05/2015  
**M.S. Aerospace Engineering;** *MIT*; Cambridge, MA 05/2012  
**B.S. Mechanical Engineering;** *Brigham Young University (BYU)*; Provo, UT 04/2010

## RESEARCH and WORK EXPERIENCE

**Decision Making Under Uncertainty, Ph.D. Dissertation Topic** 2012-2015

- Designing novel reinforcement learning algorithms that allow robots to use pre-existing simulations to speed real-world learning
- Testing algorithms on RC car that learns to race and drift

**Variable-Pitch Quadrotor, Master's Research Topic** 2010-2012

- Designed, built, and tested novel quadrotor capable of aggressive aerobatics and inverted flight
- Developed new autopilot hardware, software, and control algorithms for aggressive flight

**Mechanical Design Engineer, SpotterRF, Orem, UT** 05/2010-08/2010

- Developed new heat management techniques for small radar devices resulting in 20+ C high-temperature performance increase
- Designed new, carbon-fiber, light-weight case for radar encasement

**Aerial Robotics Controls Research Assistant, BYU, Provo, UT** 02/2008-04/2010

- 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
- Wrote and implemented control and optimization code for data collection

## SELECTED PUBLICATIONS

**Cutler, Walsh, How, "Reinforcement Learning with Multi-Fidelity Simulators," ICRA, May 2014**  
**Cutler, Michini, How, "Lightweight Infrared Sensing for Relative Navigation of Quadrotors,"**  
**ICUAS, May 2013**  
**Chowdhary, Wu, Cutler, How, "Rapid Transfer of Controllers Between {UAVs} using Learning**  
**Based Adaptive Control," ICRA, May 2013**  
**Cutler, How, "Actuator Constrained Trajectory Generation and Control for Variable-Pitch**  
**Quadrotors," GNC, Aug 2012**

## OTHER EXPERIENCE

**Volunteer; The Church of Jesus Christ of Latter-day Saints; Rostov, Russia** 7/2005-7/2007

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

## SKILLS

### Technical

- C++, Python, Matlab, Git, ROS, SolidWorks
- Microcontrollers, Embedded programming

### Areas of Expertise

- Control theory, Real-time control, Machine learning, Reinforcement learning