

# Devin T. Schwab

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**Objective:** Develop new algorithms and techniques that improve robot autonomy and allow for more complex robot behavior and adaptability through machine learning techniques

**Education:**

- Aug. 2015 – present    **Robotics Institute – Carnegie Mellon University**    Pittsburgh, PA
  - PhD Program
  - GPA: 4.0
  - Adviser: Manuela Veloso
  - NDSEG Fellowship recipient
- Aug. 2014 – Sept. 2015    **Case Western Reserve University**    Cleveland, OH
  - Masters in Computer Science
  - Thesis Title: Hierarchical Sampling for Least-Squares Policy Iteration
  - Adviser: Soumya Ray
  - GPA: 4.0
  - Focused on methods of including prior knowledge from task hierarchies into offline reinforcement learning algorithms.
  - Additional research project focusing on apprenticeship learning (learning from watching an expert) on actual human data, with the goal of creating a simulator capable of mimicking a human's interaction with haptic devices under a variety of adverse conditions such as high latency
- Aug. 2009 – Aug. 2014    **Case Western Reserve University**    Cleveland, OH
  - BSE in Electrical Engineering, Summa Cum Laude
  - BS in Computer Science, Summa Cum Laude
  - Minor in Japanese
  - GPA: 4.0
  - Accepted into the B.S./M.S. program
- May 2012 – July 2012    **Temple University Japan Campus**    Tokyo, Japan
  - Lived with a host-family
  - Studying Japanese language and culture
- May 2010 – June 2010    **Waseda University (早稲田大学)**    Tokyo, Japan
  - Lived with a host-family
  - Studied the Japanese language

**Work Experience**

**The University of Hong Kong – Hong Kong**

Feb. 2013 – Dec. 2013 – **Research Associate with DARPA Robotics Challenge (DRC) Team**

**Research Goals:** Develop novel interfaces for commanding the Atlas robot using different input devices and develop ways to display the robot sensor data. Compare the interfaces to determine which configuration the operators perform best with.

- Gained experience designing and executing experiments using the interfaces I developed and integrated
- Wrote software to complete the 8 DRC Trials tasks which included: walking, manipulation and driving using a humanoid robot named Atlas
- Developed software to provide robot interactions using devices such as the Kinect, the PS Move, Wiimote and the Leap Motion
- Wrote software to process data from the Carnegie Robotics Multisense Head
- Wrote software to control the Sandia National Laboratories' robotic hand
- Worked on team's software architecture for the competition

**NASA Glenn Research Center – Cleveland, OH**

May 2011-Dec. 2011 – **Co-op Rotation with the System Engineering Branch**

**Research Goals:** Develop hardware and software to emulate RF channel effects and network topologies. Use these technologies to enable testing of actual RF equipment in real-time with simulated equipment in simulated scenarios.

- Helped design the initial architecture of a space communications lab that will cut costs and decrease testing time when completed
- Published *Hardware and Software Integration to Support Real-Time Space-Link Emulation* in 2012 IEEE 17th International Workshop on Computer Aided Modeling and Design of Communication Links and Networks (CAMAD)

**Research Goals:** Develop data analysis scripts to verify that ISS experiment in Software Defined Radios is functioning properly in an environment mimicking low earth orbit

- Gained experience understanding experiments designed and performed by field experts
- Wrote programs and did analysis on Thermal Vacuum Chamber Testing for the CoNNeCT project, which is currently being utilized on the International Space Station

**Software Development for Simulation Software Suite**

- Provided software development advice to a new project team that was working on simulation software for space communications

June 2010 – Aug. 2010 – **Internship with Space Communications and Navigation Department**

**Research Goals:** Determine if it is possible to build a satellite that performs both lunar science and lunar communication relay for surface assets. In addition determine if the combined satellite is cost-saving

- Gained valuable experience with the academic publishing practices
- Designed communications subsystem for conceptual lunar satellite
- Published paper *SCience Hybrid Orbiter and Lunar Relay (SCHOLR) Architecture and Design* for AIAA SPACE 2010 Conference

June 2009 – Aug. 2009 – **Internship with Space Communications and Navigation Department**

**Research Goals:** Survey current RF communication techniques and NASA communication capabilities to determine the best combination of technologies that will enable a week long lunar sortie mission involving multiple astronauts on the lunar surface.

- Gained experience in literature review process
- Improved skill of reading and understanding academic conference papers
- Used knowledge of networking and wireless technologies to analyze and design communication sub-system for Lunar sortie scenario

**Case Western Reserve University – Cleveland, OH**

Aug. 2014 – Dec. 2013 – **TA for Sequential Learning and Planning Course**

- Graded assignments and held office hours for class on reinforcement learning and automated planning

2011 and 2012 Academic year – **Peer Tutor**

- Experience mentoring and teaching peers in electrical engineering and computer science topics
- Developed custom practice problems and examples to help teach students complex topics

## Publications

- Schwab, Devin T. (2015). Hierarchical Sampling for Least-Squares Policy Iteration. Thesis. Case Western Reserve University
- Murawski, R., Bhasin, K., Bittner, D., Sweet, A., Coulter, R., & Schwab, D. (2012). Hardware and Software Integration to Support Real-Time Space-Link Emulation. In 2012 IEEE 17th International Workshop on Computer Aided Modeling and Design of Communication Links and Networks (CAMAD) (pp. 271–275). IEEE.  
<http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20130000434.pdf>
- Trase, K., Coulter, R., Chaney, R., Gao, H., Huynh, D., Iaconis, N., MacMillan, T., Pitner, G., Schwab, D. (2010). SCience Hybrid Orbiter and Lunar Relay (SCHOLR) Architecture and Design. *AIAA*.  
<http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20110014981.pdf>

## Professional Groups and Other Affiliations

- IEEE Member
- AΦΩ Community Service Fraternity Member
- IEEE Eta Kappa Nu Honor Society Member

## Skills

- Experienced in C++, Java, Python, and Matlab
- Experienced with ROS (Robot Operating System) framework
- Extensive experience with real robot hardware: Atlas, Nao, Cobots