

Alexander L. Burka

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- Education**
- University of Pennsylvania**, Philadelphia, PA *2012 - present*
Ph.D. Candidate in Electrical & Systems Engineering
Research: Robotics/Haptics Advisor: Katherine Kuchenbecker
GPA: 3.61
- Swarthmore College**, Swarthmore, PA *2008 - 2012*
B.S. in Engineering
Concentration in Electrical and Computer Engineering
Minors in Cognitive Science and Mathematics
GPA: 3.93 in major, 3.81 overall
- Experience**
- Ph.D. Research**, University of Pennsylvania, Philadelphia, PA *2012 - present*
- Visuo-haptic surface classification
 - Designing, building and testing a multimodal sensor device to build a texture dataset
 - Applications to textural surface classification for autonomous robots
 - Collaboration with the University of California, Berkeley
 - Robotic technology for airplane engine repair
 - Designed and implemented a sensor package to characterize bore-blending equipment
 - Collaboration with Rolls-Royce On Wing Care
 - Developed a collision warning system for SEPTA buses
 - Designed and built a parametric speaker
 - Implemented a prototype pedestrian detector for automatic warnings
 - Member of Team THOR for the 2013 DARPA Robotics Challenge
 - Managed software and networking during dress rehearsal
 - Constructed test equipment to approximate DRC tasks
 - Computer vision and structure learning
 - Developed mathematical representation for complex articulated objects
 - Implemented a visual kinematic learning system for autonomous robots
- Robotics Research Intern**, Swarthmore College, Swarthmore, PA *2011*
- Developed visual navigation algorithm for a general purpose mobile robot (Turtlebot)
 - Worked with the ROS robot operating system and the OpenCV computer vision library
- Peer Tutoring “Wizard,”** Swarthmore College, Swarthmore, PA *2009 - 2012*
- Led study sessions and assisted with laboratory instruction in engineering courses
 - Courses: Mobile Robotics, Linear Physical System Design, and Electrical Circuit Analysis
- Laser Laboratory Intern**, Swarthmore College, Swarthmore, PA *2009*
- Developed automated waveguide testing apparatus using LabVIEW
 - Simulated coupled waveguide arrays using C
 - Sponsored through an HHMI research fellowship
- Sysadmin**, Swarthmore College Computing Society, Swarthmore, PA *2008 - 2012*
- Spearheaded equipment reservation web application project
 - Developed RFID card entry system
 - Administered Linux servers and Mac OS X clients
- Summer Intern**, MIT Lincoln Laboratory, Lexington, MA *2008*
- Developed web application for publication tracking
 - Planned and implemented a robotics workshop for high school students

Leadership Activities	Village Education Project <i>2009 - 2012</i>
	<ul style="list-style-type: none"> • Student-run nonprofit working against educational inequality in rural Ecuador • Developed and taught computer curriculum in Ecuador (summer 2009) • Assisted with supervising volunteers in Ecuador (summer 2011) • Directed fundraising activities <ul style="list-style-type: none"> – Designed and implemented silent auction web application – Secured loaner laptops through the OLPC Contributors Program
	IEEE Swarthmore Student Chapter <i>2010 - 2011</i>
	<ul style="list-style-type: none"> • Chapter president, 2010-2011 • Promoted electrical engineering-related activities within the department • Developed firmware for student Micromouse robotics team
Awards and Honors	NSF Graduate Research Fellowship <i>awarded 2013</i>
	Tau Beta Pi , The Engineering Honor Society <i>initiated 2011</i>
	Sigma Xi , The Scientific Research Society <i>inducted 2009</i>
Publications	Alex Burka, Siyao Hu, Stu Helgeson, Shweta Krishnan, Yang Gao, Lisa Anne Hendricks, Trevor Darrell and Katherine J. Kuchenbecker (2016). <i>Design and Implementation of a Visuo-Haptic Data Acquisition System for Robotic Learning of Surface Properties</i> . Haptics Symposium, 1-3.
	Alex Burka, Alaric Qin and Daniel D. Lee. <i>An Application of Parametric Speaker Technology to Bus-Pedestrian Collision Warning</i> . Intelligent Transportation Systems Conference (ITSC) 2014; Qingdao, China.
	Alex Burka and Matt Zucker. <i>Vision-Based Localization for Mobile Robots</i> . Poster session presented at: Sigma Xi. October 21, 2011; Swarthmore, PA.
	Alex Burka, Lucas Janes, Bo Sun, and Lynne Molter. <i>Non-linear transmittance properties of dielectric slab waveguides</i> . Poster session presentation at Sigma Xi. October 21, 2009; Swarthmore, PA.
	Alex Burka, Lucas Janes, Bo Sun, and Lynne Molter. <i>Numerical simulation of loosely coupled circular waveguide arrays</i> . Poster session presentation at Sigma Xi. October 21, 2009; Swarthmore, PA.
Skills	<i>Languages:</i> English (native), Spanish (conversational)
	<i>Engineering Skills:</i> Robotics, Circuit design, Embedded processor development
	<i>Programming:</i> Rust, C/C++, Python, Java, HTML/JS, Clojure, L ^A T _E X
	<i>Computer Software:</i> Linux/OS X/Windows, Android, MATLAB, PCB Artist