

## EDUCATION

### **University of California, Berkeley**

PhD. Mechanical Engineering, Controls  
Expected May 2017

MS. Mechanical Engineering, Controls  
Expected Dec 2014  
GPA: 3.78

### **University of Maryland**

B.S. Mechanical Engineering,  
Minor in Computer Science  
May 2012 | College Park, MD  
GPA: 3.69

## HONORS, AWARDS

- NSF Graduate Research Fellowship, 2012-Present
- Markowski-Leach Scholarship, 2013-Present
- University of Maryland Engineering Leadership Award, 2012
- University of Maryland Presidential Scholarship, 2008-2012
- L-3 Communications Scholarship, 2011-2012
- University of Maryland Office of LGBT Equity Scholarship, 2011
- Thales Communications Scholarship, 2010
- Terex Corporation Scholarship, 2009

## OUTREACH, LEADERSHIP

- **Graduate Peer Advisor.** Equity, Diversity, and Inclusion Initiative in the Mechanical Engineering Department at UC Berkeley. Aug 2014 - Present.
- **Coordinator, Chapter Leadership Programs.** Out in Science, Technology, Engineering, and Mathematics (oSTEM) Incorporated. July 2012 - Present.
- **President, Co-Founder.** oSTEM at the University of Maryland. Nov 2010 - Apr 2012.

## PUBLICATIONS

- **System Design and Locomotion of SUPERball, an Autonomous Tensegrity Robot.** Sabelhaus, A.P. et al. Submitted to International Conference on Robotics and Automation (ICRA) 2015
- **Design and Control of Compliant Tensegrity Robots through Simulation and Hardware Validation.** Caluwaerts, K., ... Sabelhaus, A.P. et al. Journal of the Royal Society Interface 2014
- **Hardware Design and Testing of SUPERball, a Modular Tensegrity Robot.** Sabelhaus, A.P. et al. The 6th World Conference on Structural Control and Monitoring (6WCSM) 2014
- **SUPERball: Exploring Tensegrities for Planetary Probes.** Bruce, J., Sabelhaus, A.P. et al. 12th International Symposium on Artificial Intelligence, Robotics, and Automation in Space (i-SAIRAS) 2014
- **Design and Evolution of a Modular Tensegrity Robot Platform.** Bruce, J., ...Sabelhaus, A.P. et al. International Conference on Robotics and Automation (ICRA) 2014
- **TinyTeRP: A Tiny Terrestrial Robotic Platform with Modular Sensing.** Sabelhaus, A.P. et al. International Conference on Robotics and Automation (ICRA) 2013

## PRESENTATIONS, WORKSHOPS, POSTERS

- **Mechatronic Design of Tensegrity Robotic Systems for Dynamic Locomotion.** NASA Ames Research Center Autonomous Systems Lab Intern Poster Symposium, Aug 2013. Poster Session.
- **TinyTeRP: A Tiny Terrestrial Robotic Platform with Modular Sensing.** International Conf. on Robotics and Automation (ICRA), May 2013. Presentation.
- **TinyTeRP: A Tiny Terrestrial Robotic Platform.** International Symposium on Distributed Autonomous Robotic Systems (DARS), Nov 2012. Poster Session.

## RESEARCH EXPERIENCE

### **Berkeley Emergent Space Technologies Lab (BEST) | Graduate Research Fellow**

Sept 2012 - Present | Berkeley, CA

- Led team of 5 master's students in designing and testing structural robotics components
- Created new research program (the "Tensegrity Spine Hardware Project"), recruited 5 master's students, led team on design and controls research
- Recruited and mentored 2 undergraduate researchers

### **NASA Ames Research Center, Intelligent Robotics Group | Graduate Student Intern**

Feb 2013 - Present | Moffett Field, CA

- Mechanical design of SUPERball, an autonomous tensegrity robot: cable driving system, actuation system, active compliance spring system
- Sensor design for SUPERball: fabricated, tested, and calibrated, custom force gauges
- Assisted in electronics design for SUPERball and programming in ROS (Robotic OS)
- Wrote and maintained pieces of the NASA Tensegrity Robotics Toolkit (NTRT) in C++
- Simulated different motions of SUPERball in NTRT, tested potential controls

### **Maryland Microrobotics Lab | Undergraduate Researcher**

Feb 2011 - Aug 2012 | College Park, MD

- Designed circuit and PCB layout for 1.2 cm<sup>2</sup> mobile robot
- Wrote data collection software and control algorithm for robot
- Led team of 3 undergraduates and 1 REU student to a successful paper submission

### **U.S. Army Corps of Engineers Research Center | Mechanical Engineering Research Intern**

Summer 2011 | Alexandria, VA

- Researched and tested long-range wireless sensor network system
- Wrote data collection software and management software for network nodes

## OTHER ENGINEERING DESIGN EXPERIENCE

### **Soft Classification for Hybrid Systems using Gaussian Process Models**

Spring 2014 | Hybrid Systems Identification and Control Course, UC Berkeley

- Researched Gaussian Process Models for Machine Learning, implemented software in MATLAB and Python for regression over GPs
- Developed innovative (to-be-published) algorithm for probabilistically classifying systems with online regression
- Evaluated algorithm on simulated system (data from SUPERball simulation in NTRT)

### **Optimization-Based Control for an Underactuated Magnetic Levitation System**

Fall 2013 | Advanced Robotics Course, UC Berkeley

- Designed a sequential quadratic programming trajectory-tracking controller for a simplified model of an underactuated magnetic levitation system
- Developed input-output nonlinear system transform for optimization initialization
- Simulated and evaluated trajectory tracking performance for disturbances

### **NearZero Design Project | Controls Group Lead**

Spring 2013 | Advanced Design and Automation Course, UC Berkeley

- Designed sensing and actuation system (3 PCBs, digital and analog) for magnetically-levitated flywheel energy storage system
- Formulated a LQR controller, performed stability analysis of control system