

# Drew (Andrew P.) Sabelhaus

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## EDUCATION

### PHD. MECHANICAL ENGINEERING

Field: Control Systems

University of California, Berkeley

Expected May 2018

### M.S. MECHANICAL ENGINEERING

Thesis: *Mechanism and Sensor Design for SUPERball,  
a Cable-Driven Tensegrity Robot*

University of California, Berkeley

Dec. 2014

### B.S. MECHANICAL ENGINEERING

(With Minor in Computer Science)

University of Maryland, College Park

May 2012

## GRANTS, FUNDING, AWARDS

- **NASA Space Technology Research Fellowship.** Full student support, plus supplies (\$75,000/yr), 4 years. Title: *Trajectory Tracking in Nonlinear, High-Order, Underactuated Robotic Systems*. 2015-2018/19.
- **NSF Graduate Research Fellowship.** Full student support (\$32,000/yr), 3 years. 2012-2015

## PUBLICATIONS

- **Model-Predictive Control of a Flexible Spine Robot.** Sabelhaus, A.P.; Akella, A.K.; Ahmad, Z.A.; SunSpiral, V.; American Control Conference, May 2017.
- **DNA-Structured Linear Actuators.** Zampaglione, K.; Sabelhaus, A.P.; Chen, L.; Agogino, A.M.; Agogino, A.K.; ASME International Design Engineering Technical Conferences (IDETC) / 40th Mechanisms and Robotics Conference, Aug 2016.
- **Mechanism Design and Simulation of the ULTRA Spine, a Tensegrity Robot.** Sabelhaus, A.P.; Ji, H.; Hylton, P.; Madaan, Y.; Yang, C.; Friesen, J.; SunSpiral, V.; Agogino, A.M.; ASME International Design Engineering Technical Conferences (IDETC) / 39th Mechanisms and Robotics Conference, Aug 2015.
- **System Design and Locomotion of SUPERball, an Untethered Tensegrity Robot.** Sabelhaus, A.P.; Bruce, J.; Caluwaerts, K.; Manovi, P.; Fallah Firoozi, R.; Dobi, S.; Agogino, A.M.; SunSpiral, V.; IEEE International Conference on Robotics and Automation (ICRA), May 2015.
- **Design and Control of Compliant Tensegrity Robots through Simulation and Hardware Validation.** Caluwaerts, K.; Despraz, J.; Iscen, A.; Sabelhaus, A.P.; Bruce, J.; Schrauwen, B.; SunSpiral, V.; Journal of the Royal Society Interface, Sept. 2014.
- **Hardware Design and Testing of SUPERball, a Modular Tensegrity Robot.** Sabelhaus, A.P.; Bruce, J.; Caluwaerts, K.; Chen, Y.; Lu, D.; Liu, Y.; Agogino, A.K.; SunSpiral, V.; Agogino, A.M.; The 6th World Conference on Structural Control and Monitoring (6WCSCM), July 2014
- **SUPERball: Exploring Tensegrities for Planetary Probes.** Bruce, J.; Sabelhaus, A.P.; Chen, Y.; Lu, D.; Morse, K.; Milam, S.; Caluwaerts, K.; Agogino, A.M.; SunSpiral, V.; 12th International Symposium on Artificial Intelligence, Robotics, and Automation in Space (i-SAIRAS), June 2014
- **Design and Evolution of a Modular Tensegrity Robot Platform.** Bruce, J.; Caluwaerts, K.; Iscen, A.; Sabelhaus, A.P.; SunSpiral, V.; IEEE International Conference on Robotics and Automation (ICRA), May 2014
- **TinyTeRP: A Tiny Terrestrial Robotic Platform with Modular Sensing.** Sabelhaus, A.P.; Mirsky, D.; Hill, L.M.; Bergbreiter, S.; IEEE International Conference on Robotics and Automation (ICRA), May 2013

## PRESENTATIONS, WORKSHOPS, POSTERS

- Robotics, Mechatronics, and Intelligent Systems. Osher Lifelong Learning Institute, Feb 2014. Invited Talk.
- Fabulous Facilitation Frameworks for LGBTQ College Students. Out in Science, Technology, Engineering, and Mathematics Incorporated (oSTEM) National Conference, Nov 2013. Workshop.
- 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.
- Topics in Queer Student Leadership: Assessment, Transitions, and Goal-Driven Planning. Midwest Bisexual, Gay, Lesbian, Transgender, and Allies College Conference, Feb 2013. Workshop. Also presented at National Gay and Lesbian Task Force Creating Change Conference, Jan 2013. Workshop.
- TinyTeRP: A Tiny Terrestrial Robotic Platform. International Symposium on Distributed Autonomous Robotic Systems (DARS), Nov 2012. Poster Session.

## LEADERSHIP, OUTREACH, AND ORGANIZATIONAL WORK

### **EQUITY, DIVERSITY, AND INCLUSION INITIATIVE | GRADUATE PEER ADVISOR**

Aug 2014 - Present | Berkeley, CA

- One of two graduate students spearheading diversity programs in the Mechanical Engineering Department at UC Berkeley
- Held office hours, advised students on matters of inclusion, identity, research, and professional relationships
- Organized lab tours for two high school groups from Santa Cruz, CA
- Organized fellowship application draft reading team for under-represented students in the department
- Currently planning and organizing large “Engineering for All” initiative for spring 2015

### **OUT IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS INCORPORATED**

**COORDINATOR, CHAPTER LEADERSHIP PROGRAMS**

July 2012 - Present | Berkeley, CA

- Led data collection, programs assessment, and new programming efforts for national nonprofit organization serving LGBTQ students in STEM fields
- Organized and led the Chapter Handbook Project team
- Wrote 50+ pages of leadership instructional material for current oSTEM chapter leaders, edited other sections of the 80 page oSTEM Chapter Handbook (distributed Feb 2013)
- Created online assessment strategy for handbook among student users
- Created and presented unique skills workshops at national LGBTQ+ conferences
- Temporarily filled open position on oSTEM Incorporated Board of Directors from late 2012 until mid 2013

### **OUT IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS AT UC BERKELEY**

**SECONDARY ADVISOR**

Aug 2012 - Present | Berkeley, CA

- Provided advice, training, and support to local oSTEM Chapter as a former leader
- Mentored current and upcoming student leaders, in both personal and professional capacities
- Assisted in leadership transitions and programs assessment

### **OUT IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS AT MARYLAND**

**CHAPTER PRESIDENT**

Nov 2010 - April 2012 | College Park, MD

- Co-founded and led chapter of oSTEM at the University of Maryland, College Park
- Wrote budgets for conference attendance and local events
- Coordinated corporate sponsorships, totaling over \$3,000
- Trained current group of student leaders for their leadership transition

### **QUEER COUNCIL AT THE UNIVERSITY OF MARYLAND | FOUNDER, FACILITATOR**

May 2011 - April 2012 | College Park, MD

- Founded organizational inter-group council for LGBTQ+ student group leaders at the University of Maryland
- Led dialogue programs and generated cross-programming between groups
- Facilitated discussions and advocated for the queer community to university staff and management