

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

9. **Model-Predictive Control of a Flexible Spine Robot.** Sabelhaus, A.P.; Akella, A.K.; Ahmad, Z.A.; SunSpiral, V.; American Control Conference, May 2017.
8. **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.
7. **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.
6. **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.
5. **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.
4. **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
3. **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
2. **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
1. **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

PUBLICATIONS UNDER REVIEW, WORKS-IN-PROGRESS

- **Modular Elastic Lattice Platform for Rapid Prototyping of Tensegrity Robots.** Chen, L-H.; Daly, M.C.; Sabelhaus, A.P.; Janse van Vuuren, L.A.; Garnier, H.J.; Verdugo, M.I.; Tang, E.; Spangenberg, C.U.; Ghahani, F.; Agogino, A.K.; Agogino, A.M.
- **A Flexible Actuated Spine For Quadruped Robots, And An Analysis Of Its Ground Reaction Forces.** Sabelhaus, A.P., Janse van Vuuren, L.A.; Joshi, A.; Zhu, E.; Garnier, H.J.; Mishra, A.; Agogino, A.K.; SunSpiral, V.; Agogino, A.M.

PATENTS

- **DNA Structured Linear Actuator.** Agogino, A.; Zampaglione, K.; Chen, L-H.; Sabelhaus, A.; US Patent Application Number: PCT/US2016/032899. Under Review.
- **Elastic Lattices for Design of Tensegrity Structures and Robots.** Chen, L-H.; Agogino, A.; Daly, M.; Sabelhaus, A.P.; Agogino, A.K.; Provisional Patent.

PRESENTATIONS, WORKSHOPS, POSTERS

- **DNA-Structured Linear Actuators.** SKTA Innopartners IP Redux Event, Apr 2016.
- **ULTRA Spine Project.** Bay Area Robotics Symposium, Oct 2015. Presentation.
- **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.
- **Topics in Queer Student Leadership: Assessment, Transitions, and Goal-Driven Planning.** Midwest Bisexual, Lesbian, Gay, Transgender, and Allies College Conference (MBLGTACC), Feb 2013. Workshop. Also presented at National Gay and Lesbian Task Force (NGLTF) Creating Change Conference, Jan 2013. Workshop.
- **TinyTeRP: A Tiny Terrestrial Robotic Platform.** International Symposium on Distributed Autonomous Robotic Systems (DARS), Nov 2012. Poster Session.

MENTORSHIP + ADVISING

Drew has mentored or advised the following students in an official capacity:

Graduate Student Researchers:

- Lara Janse van Vuuren, M.Eng 2017
- Shirley (Huajing) Zhao, M.Eng 2017
- Robel Teweldebirhan, M.Eng 2017
- Asher Saghian, M.Eng 2017
- June (Shu Jun) Tan, M.Eng 2017
- Kyle Zampaglione (project mentoring), M.S. 2015
- Patrick Hylton, M.Eng 2015
- ChanWoo Yang, M.Eng 2015
- Yakshu Madaan, M.Eng 2015
- Yangxin Chen, M.Eng 2014
- Dizhou Lu, M.Eng 2014
- Margaret (Yuejia) Liu, M.Eng 2014

Undergraduate Student Researchers:

- Lua Varner, B.S. 2018
- Hunter Garnier, B.S. 2018
- Akhilesh Mishra, B.S. 2018
- Ankita Joshi, B.S. 2017
- Jorge Vizcayno, B.S. 2016
- Heeyeon Kwon, B.S. 2016
- Zeerek Ahmad, B.S. 2015
- Roya Fallah Firoozi, B.S. 2014
- Sarah Dobi, B.S. 2015

REVIEWER FOR JOURNALS AND CONFERENCES

Drew has served as a reviewer for the following journals and conference venues:

- IEEE International Conference on Robotics and Automation (ICRA), 2017.
- American Control Conference (ACC), 2017.
- ASME International Design Engineering Technical Conference (IDETC), 2016-2017.
- International Journal of Space Structures, 2017.
- IEEE Conference on Control Technology and Applications (CCTA), 2017.

DIVERSITY + OUTREACH WORK

- **Unofficial Advisor on Transgender Policies.** American Society of Mechanical Engineers (ASME) - Planning Committee for ASME International Design Engineering Technical Conference 2017 in Charlotte, NC. Aug 2016.
- **Graduate Peer Advisor.** UC Berkeley Mechanical Engineering - Equity, Diversity, and Inclusion Initiative. Berkeley, CA, Aug 2014 - May 2015.
- **Coordinator, Chapter Leadership Programs.** Out in Science, Technology, Engineering, and Mathematics (oSTEM) Incorporated. College Park, MD and Berkeley, CA, July 2012 - April 2013.
- **Secondary Advisor.** Out in Science, Technology, Engineering, and Mathematics (oSTEM) at UC Berkeley. Berkeley, CA, Aug 2012 - April 2014.
- **Chapter President.** Out in Science, Technology, Engineering, and Mathematics (oSTEM) at Maryland. College Park, MD, Nov 2010 - April 2012.
- **Founder and Facilitator.** Queer Council at the University of Maryland. College Park, MD, May 2011 - April 2012.