Drew (Andrew P.) Sabelhaus

2807 Piedmont Ave, Berkeley CA 94705
www.apsabelhaus.com | apsabelhaus@berkeley.edu | (301) 807-9842

EDUCATION

PHD. MECHANICAL ENGINEERING — University of California, Berkeley
Field: Control Systems — Expected May 2018

M.S. MECHANICAL ENGINEERING — University of California, Berkeley
Thesis: *Mechanism and Sensor Design for SUPERball, a Cable-Driven Tensegrity Robot* — Dec. 2014

B.S. MECHANICAL ENGINEERING — University of Maryland, College Park
(With Minor in Computer Science) — 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

10. 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.; ASME International Design Engineering Technical Conferences (IDETC) / 41st Mechanisms and Robotics Conference, Aug 2017.
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

- Trajectory Tracking Control of a Flexible Spine Robot, With and Without a Reference Input. Sabelhaus, A.P.; Zhao, S. (H.); Daly, M.C.; Tang, E.; Zhu, E.; Akella, A.K.; Ahmad, Z.A.; SunSpiral, V.; Agogino, A.M.
- A Smooth Dynamics Model for Cable Slackness in Cable-Driven Robots. Sabelhaus, A.P.
- 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.
- Quadruped Robot Spines Require Torsion for Foot-Lifting. Sabelhaus, A.P.

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

- Advisor to the ASME Diversity and Inclusion Strategic Commitee (DISC). American Society of Mechanical Engineers (ASME) - DISC Subcommittee for the review of Diversity and Inclusion policy documents. Revised ASME policy P-15.11, Position Paper PS16-02, and Statement on Diversity and Inclusion. Documents now explicitly call out support for facility access for LGBTQ members and members with different levels of ability or disability. Also served on the planning Committee for ASME International Design Engineering Technical Conference 2017 in Charlotte, NC. Aug 2016, in an unofficial advisory role for transgender restroom access.
- 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) Incoporated. 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.