Andrew Sabelhaus

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EDUCATION

PH.D. MECHANICAL ENGINEERING — University of California, Berkeley
Dissertation title: *Tensegrity Spines for Quadruped Robots* — August 2019
Dissertation Committee: *Alice M. Agogino (Chair), Andrew Packard, Claire Tomlin, Murat Arcak*

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

B.S. MECHANICAL ENGINEERING — University of Maryland, College Park
Minor in Computer Science — May 2012

APPOINTMENTS

Boston University	Assistant Professor
Department of Mechanical Engineering	2022 - Present
Division of Systems Engineering	2022 - Present
Center for Information Systems and Engineering	2022 - Present
Carnegie Mellon University	Postdoctoral Research Fellow
Deptartment of Mechanical Engineering	2019 - 2021
NASA Ames Research Center	Visiting Technologist
Intelligent Systems Division	2015 - 2019
University of California, Berkeley	Graduate Research Fellow
Department of Mechanical Engineering	2012-2019

RESEARCH OUTPUT SNAPSHOT

Peer-Reviewed Publication Count:				Total Citations:	h-index:
	Conference:	Journal:	Total:		
1st-Author or PI:	8	4	12	1022* (458†)	15* (10†)
All:	13	10	23		

**Via Google Scholar, https://scholar.google.com/citations?user=ze69yEMAAAAJ&hl=en.*
†Via Web of Science, https://www.webofscience.com/wos/author/record/1791313.

PUBLICATIONS RELATED TO PROPOSED PROJECT

1. J.C. Pacheco Garcia, R. Jing, M.L. Anderson, M. Ianus-Valdivia, A.P. Sabelhaus, ``A Comparison of Mechanics Simplifications in Pose Estinmation for Thermally-Actuated Soft Robot Limbs.'' *ASME 2023 Conference on Smart Materials, Adaptive Structures, and Intelligent Systems (SMASIS)*, Sept. 2023
2. A.P. Sabelhaus, Z. Patterson, A. Wertz, C. Majidi, ``Safe Supervisory Control of Soft Robot Actuators.'' *Under Review.* Available, arXiv:2208.01547
3. R. Jing, M. Anderson, M. Ianus-Valdivia, A. Akber, C. Majidi, A.P. Sabelhaus, ``Safe Balancing Control of a Soft Legged Robot.'' *Under Review.* Available arXiv:2209.13715
4. X. Huang, Z.J. Patterson, A.P. Sabelhaus, W. Huang, K. Chin, Z. Ren, M.K. Jawed, C. Majidi, ``Design and Closed Loop Motion Planning of an Untethered Swimming Soft Robot using 2D Discrete Elastic Rods Simulations,'' *Advanced Intelligent Systems*, 2200163, 2022. doi:10.1002/aisy.202200163.
5. A.P. Sabelhaus, R.K. Mehta, A. Wertz, C. Majidi, ``In-Situ Sensing and Dynamics Predictions for Electrothermally-Actuated Soft Robot Limbs,'' *Frontiers in Robotics and AI*, Vol. 9, May 2022. doi:10.3389/frobt.2022.888261

6. M. Zadan, D.K. Patel, A.P. Sabelhaus, J.Liao, A. Wertz, L. Yao, C. Majidi, ``Liquid Crystal Elastomer with Integrated Soft Thermoelectrics for Shape Memory Actuation and Energy Harvesting,'' *Advanced Materials*, April 2022. doi:10.1002/adma.202200857
7. A. Wertz*, A.P. Sabelhaus, C. Majidi, ``Trajectory Optimization for Thermally-Actuated Soft Planar Robot Limbs,'' *IEEE International Conference on Soft Robotics (RoboSoft)*, April 2022. doi:10.1109/RoboSoft54090.2022.9762226
8. Z.J. Patterson, A.P. Sabelhaus, C. Majidi, ``Robust Control of a Multi-Axis Shape Memory Alloy-Driven Soft Manipulator,'' *IEEE Robotics and Automatics Letters*, April 2022. doi:10.1109/LRA.2022.3143256
9. A.P. Sabelhaus, K. Zampaglione, E. Tang, L.H. Chen, A.K. Agogino, A.M. Agogino, ``Double-Helix Linear Actuators.'' *Journal of Mechanical Design (ASME)*, Vol. 143, Issue 10, Oct. 2021. doi:10.1115/1.4050739
10. A.P. Sabelhaus, C.Majidi, ``Gaussian Process Dynamics Models for Soft Robots with Shape Memory Actuators.'' *IEEE International Conference on Soft Robotics (RoboSoft)*, April 2021. doi:10.1109/RoboSoft51838.2021.9479294
11. A.P. Sabelhaus, H. Zhao, E. Zhu, A.K. Agogino, A.M. Agogino, ``Model-Predictive Control with Inverse Statics Optimization for Tensegrity Spine Robots.'' *IEEE Transactions on Control System Technology*, Vol. 29, Issue 1, Jan. 2021. doi:10.1109/TCST.2020.2975138
12. Z. Patterson, A.P. Sabelhaus, K. Chin, T. Hellebrekers, C. Majidi, ``An Untethered Brittle Star Robot for Closed-Loop Underwater Locomotion.'' *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Oct. 2020. doi:10.1109/IROS45743.2020.9341008
13. A.P. Sabelhaus, J. Bruce, K. Caluwaerts, P. Manovi, R.F. Firoozi, S. Dobi, A.M. Agogino, V. SunSpiral, ``System Design and Locomotion of SUPERball, an Untethered Tensegrity Robot.'' *IEEE International Conference on Robotics and Automation (ICRA)*, May 2015. doi:10.1109/ICRA.2015.7139590

SYNERGISTIC ACTIVITIES

1. Mentorship, Research Supervision, Student Advising:
   (a) Graduate students: Ph.D. - 3 students, Masters (Research) - 3 students, Masters (Professional) - 12 students. Undergraduate researchers: 20 students.
   (b) Current and former mentees who self-identified as under-represented (commonly women, URM, LGBTQ+ students, disabilities, etc.): 13/20 = 65% undergraduate, 13/21 = 62% graduate, 26/41 = 63% total.
2. Service:
   (a) NSF Panel Reviewer, 2022-2023
   (b) Service at Boston University: Dept. of Mechanical Engineering, Organizer of PhD Fellowships Writing Group, 2022. Division of Systems Engineering: Graduate Admissions Committee, 2022-2023.
   (c) Service at UC Berkeley: Dept. of Mechanical Engineering, Graduate Peer Advisor 2014-2015, Diversity and Inclusion Committee, 2015-2019, Grad Student Advisors to Faculty Search Committees: 2017 - 2019.
3. Editorial Work and Peer Review:
   (a) Associate Editor, IEEE International Conference on Robotics and Automation (ICRA) 2023, Humanoids and Animaloids section
   (b) Guest Editor, Frontiers in Robotics and AI Special Topic on Materials, Design, Modeling, and Control of Soft Robotic Artificial Muscles, 2022
   (c) Peer review for Journals: x19 from 2017-2023. Peer review for conferences: x16 from 2016-2022.
4. Teaching:
   (a) Instructor, Boston University. Computational Linear Algebra, 2022-2023, course evaluations overall instructor rating: 4.54/5.0. Introduction to Computer Programming, 2023: in progress.
   (b) Graduate Student Instructor (GSI), University of California Berkeley, 2018: Design of Microprocessor-Based Mechanical Systems. Course evaluations: 4.7/5.0 undergraduate students, 4.88/5.0 graduate students.
   (c) Outstanding Graduate Student Instructor Award, University of California Berkeley, 2018-2019
5. Outreach:
   (a) NASA Downlink Day with Astronaut Bob Hines at Boston University, 2022: hosted groups of under-represented K-12 students for lab tours and demos. Repeated in 2023.
   (b) Led outreach events at UC Berkeley: ``Cal Day'' for research group, Society of Women Engineers tours and recruiting for research group, various high school and middle school tours, ``Robot Block Party'' 2014-2016.
   (c) Carnegie Science Center SciTech Day, 2019: school outreach event with research group at Carnegie Mellon University.