

L. Maxwell Hill

Tufts University

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Education

Tufts University, Medford, Mass. 2015-Present
Ph.D. Candidate, Mechanical Engineering

Tufts University, Medford, Mass. 2013-2015 (Expected)
M.S., Mechanical Engineering
Thesis: Robotic Communication and Sensing using Structural Vibration of Natural Waveguides

University of Maryland, College Park, Md. 2009-2013
B.S., Mechanical Engineering

Research Objectives

As robots and machines are integrated into our daily lives they will need better ways of interacting with their surroundings. These improvements, I believe, should be functionally *simple*, adding complexity only to behavioral capabilities. So far, my work examines vibration-based communication and sensing in living creatures and applications to robotic platforms. My goal is to push the limits of actuation and sensing in machines through thoughtful design of their natural dynamics and attention to feedback inherent to their environments.

Relevant Experience

Tufts University, Microscale Sensors and Systems Lab, Medford, Mass. 2013-Present
Research Assistant
I am working on substrate-borne vibration-based communication and sensing methods for robots.

University of Maryland, Microrobotics Lab, College Park, Md. 2011-2013
Undergraduate Research Assistant
I worked on the TinyTeRP project - a Tiny Terrestrial Robotics Platform for exploring distributed control and sensing algorithms. I designed the mechanical drivetrain of the cubic centimeter mobile platform, as well as developing some of the hardware.)

Honors and Awards

Graduate:

- Graduate Research Award, Department of Mechanical Engineering, Tufts University, 2015
- National Science Foundation IGERT: Soft Material Robotics Fellow, Tufts University, 2013-2015

Undergraduate:

- Dean's List
- BAE Systems FIRST Robotics Scholarship, University of Maryland, 2009-2013
- Presidential Scholarship, University of Maryland, 2009-2013

Publications

Conference Papers

- [1] L.M. Hill, J. Mekdara, B. Trimmer, and R. White, "Structural Vibration for Robotic Communication and Sensing on One-Dimensional Structures," *In Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, Sept. 27-Oct. 3, 2015.
- [2] L.M. Hill, D. Luo, and M. Moeller, "Operational Determination of Car Window Damping," *In Proceedings of SAE Noise and Vibration Conference and Exhibition*, Grand Rapids, Michigan, June 22-25, 2015.
- [3] A.P. Sabelhaus, D. Mirsky, L.M. Hill, N. C. Martins, and S. Bergbreiter, "TinyTeRP: A Tiny Terrestrial Robotic Platform with Modular Sensing for Controlling Large Numbers of Miniature Robots," *In Proceedings of IEEE International Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany, May 6-10, 2013.

Theses

- [1] L.M. Hill, "Robotic Communication and Sensing using Structural Vibration in Natural Waveguides," *Master's Thesis*, Tufts University, July, 2015.

Posters and Abstracts

- [1] L.M. Hill, P. Mekdara, B. Trimmer, and R. White, "Structural Vibration for Robotic Communication and Sensing on One-Dimensional Structures," *International Symposium on Adaptive Motion of Animals and Machines (AMAM)*, Massachusetts Institute of Technology, June 21-25, 2015.
- [2] A.P. Sabelhaus, D. Mirsky, L. M. Hill, N. C. Martins, and S. Bergbreiter, "TinyTeRP: A Tiny Terrestrial Robotic Platform with Modular Sensing for Controlling Large Numbers of Miniature Robots," *International Symposium on Distributed Autonomous Robotic Systems (DARS)*, Johns Hopkins University, Nov. 8-11, 2012.

References

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