

Laura Katherine Treers

ASSISTANT PROFESSOR · DEPARTMENT OF MECHANICAL ENGINEERING · UNIVERSITY OF VERMONT

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Education

University of California, Berkeley

PHD, MECHANICAL ENGINEERING

- Advisor: Prof. Hannah Stuart, Lab: Embodied Dexterity Group (edg.berkeley.edu)
- Concentration in dynamics with minors in design & integrative biology

Berkeley, CA

2018-2023

Awards, Fellowships, & Honors

- 2023 **Outstanding Graduate Student Instructor Award**, University of California
- 2022 **Graduate Division Block Grant**, University of California
- 2019 **National Defense Science & Engineering Graduate Fellowship**, Office of Naval Research
- 2018 **UC Berkeley Fellowship for Graduate Study**, University of California
Thomas Sheridan Prize for Creativity in Man Machine Integration, MIT

Publications

REFEREED JOURNAL PUBLICATIONS

- S. Kim, **L. K. Treers**, T. Myung Huh, H. S. Stuart, "Efficient Reciprocating Burrowing with Anisotropic Origami Feet". *Frontiers in Robotics and AI*, Vol 10, p. 1214160, 2023
- J. J. Page*, **L. K. Treers***, S. J. Jorgensen, R. S. Fearing, H. S. Stuart, "The Robustness of Tether Friction in Non-idealized Terrains", *IEEE Robotics and Automation Letters*, Vol 8(1), p. 424-431, 2022
- L. K. Treers**, B. McInroe, R. J. Full, H. S. Stuart, "Mole-crab inspired vertical self-burrowing". *Frontiers in Robotics and AI*, p. 263, 2022
- A. Martinez, J. DeJong, I. Akin, A. Aleali, C. Arson, J. Atkinson, P. Bandini, T. Baser, R. Borela, R. Boulanger, M. Burrall, Y. Chen, C. Collins, D. Cortes, S. Dai, T. DeJong, E. Del Dottore, K. Dorgan, R. Fragaszy, J. D. Frost, R. Full, M. Ghayoomi, D. I. Goldman, N. Gravish, I. L. Guzman, J. Hambleton, E. Hawkes, M. Helms, D. Hu, L. Huang, S. Huang, C. Hunt, D. Irschick, H. Thomas Lin, B. Lingwall, A. Marr, B. Mazzolai, B. McInroe, T. Murthy, K. O'Hara, M. Porter, S. Sadek, M. Sanchez, C. Santamarina, L. Shao, J. Sharp, H. Stuart, H. H. Stutz, A. Summers, J. Tao, M. Tolley, **L. K. Treers**, K. Turnbull, R. Valdes, L. van Paassen, G. Viggiani, D. Wilson, W. Wu, X. Yu, and J. Zheng "Bio-inspired geotechnical engineering: Principles, current work, opportunities and challenges." *Geotechnique*, Vol. 72(8) p. 687-705, 2022
- L. K. Treers**, C. Cao, H. S. Stuart, "Granular Resistive Force Theory Implementation for Three-Dimensional Trajectories." *IEEE Robotics and Automation Letters*, Vol 6(2), p. 1887-1894, 2021

* **co first authorship**

CONFERENCE PROCEEDINGS & ABSTRACTS

- L. K. Treers**, D. Soto, J. Hwang, M. D. Goodisman, D. I. Goldman, "Robot Excavation and Manipulation of Geometrically Cohesive Media" *IEEE International Conference on Robotics & Automation 2025* (Under Review)
- J. Hwang, **L. K. Treers**, D. Soto, M. D. Goodisman, D. I. Goldman, "Material Disturbance during Collective Construction with Soft Matter" *Bulletin of the American Physical Society*, Annual Meeting 2024, Abstract F38.00003
- A. Young, **L. K. Treers**, H. S. Stuart, "Gait switching enables body pitch modulation during legged burrowing in granular media" *Bulletin of the American Physical Society*, Annual Meeting 2024, Abstract G38.00004
- L. K. Treers**, D. Soto, M. D. Goodisman, D. I. Goldman, "Tunnel remodeling in fire ant (*S. invicta*) collectives" *Bulletin of the American Physical Society*, Annual Meeting 2024, Abstract F36.00009
- L. K. Treers**, D. Soto, M. D. Goodisman, D. I. Goldman, "Substrate deposition and tunnel remodeling in fire ants *S. invicta*" *Integrative & Comparative Biology*, Annual Conference 2024
- L. K. Treers**, J. J. Page, S. Jorgensen, R. S. Fearing, H. S. Stuart, "Characterizing Tether Friction on Natural Objects for Robotic Teams." *Bulletin of the American Physical Society*, Annual Meeting 2023, Abstract N00.00374, Annual Meeting 2023, Abstract N00.00374

L K Treers, “Models and Mechanisms for Robotic Mobility in Granular Media” University of California, Berkeley, 2023

L K Treers, “Investigating a non invasive method for determining muscle fiber composition.” Massachusetts Institute of Technology Thesis (MTD Space), 2018

Presentations

* *presenting author*; + *mentored undergraduate*

L K Treers*, 2024 “Robotic Excavation and Construction with Entangled Granular Media” Invited Talk, Northeast Robotics Colloquium, University of Massachusetts, Amherst, MA

L K Treers*, 2023 “Models and Mechanisms for Robotic Mobility in Granular Media.” Robotics Seminar, University of Illinois Urbana Champaign (UIUC), Champaign, IL

L K Treers*, H S. Stuart. 2019 “Decapod Inspired Burrowing Strategies.” Poster presentation: Bay Area Robotics Symposium (BARS), Berkeley, CA

L K Treers*, B. McInroe, R. J. Full, H S. Stuart. 2019 “Decapod Inspired Mechanisms for Penetration Force Reduction.” Poster Presentation: First International Workshop on Bio Inspired Geotechnics, Monterey, CA

M Norville**+, **L K Treers**, H S. Stuart, 2021. “Leg Design & Analysis for Bio Inspired Burrowing Robot.” Poster & Oral Presentation: Amgen Scholars Program Research Showcase, Berkeley, CA

Industry Experience

GE Renewable Energy, Onshore Wind

Niskayuna, NY

MECHANICAL ENGINEERING INTERN

May 2017 August 2017

- Mechanical component design and structural analysis for onshore wind turbine drive trains

NextDroid, LLC

Cambridge, MA

MECHANICAL ENGINEERING INTERN

May 2016 September 2016

- Worked on design of an autonomous underwater vehicle (AUV) for deployment at 300 meter depth as part of a small startup company team

Teaching Experience

ME3320A – Control Systems

University of Vermont

INSTRUCTOR

Fall 2024

- Instructing 3 credit ME elective course on linear control theory

ME 102B – Mechatronics Design

UC Berkeley

GRADUATE STUDENT INSTRUCTOR

2022

- Assisted faculty with teaching UC Berkeley’s 4 credit senior undergraduate capstone design course.
- Worked with a teaching team on curriculum development, including laboratory assignments and in lecture demos.

Mentoring

2023 2024 **INTERACT Lab**, University of Vermont

- Currently advising one graduate student (Chhayank Srivastava) and three undergraduates (Jack Donovan, Boaz Lovich, Nathaniel Weitzel King) in new research lab at UVM

2023 2024 **Joonha Hwang**, Georgia Tech CRAB Lab

- Advising a final year undergraduate through the development and testing of robotic proto types for swarm construction.

2022 2023 **Masters of Engineering (MEng) Capstone Project Team**, UC Berkeley

- Managed a team of 3 MEng students through the completion of a year long research project
- Supervised the team’s redesign of a mole crab inspired burrowing robot

2021 Malyka Norville, Howard University Amgen Scholars Program

- Mentored a visiting student through the completion of a summer research exchange program.
- Taught prototyping and data analysis skills, for application to a project on characterization of robot legs.

2019 2021 Embodied Dexterity Group, UC Berkeley

- Advised multiple undergraduate researchers: Kristin Yamane (2019 2021), Krish Nayar (2020 2021), Wenny Mao (2019)

Outreach & Professional Development

SERVICE AND OUTREACH

2020 2024 FIRST Robotics Competition, Mentor

Burlington, VT

- Active mentoring for 3 FIRST Teams over the past 4 years, including local FRC Team Green Mountain Robotics 9101, Atlanta's G3 Robotics 1648, and the all girls team Roses and Rivets 16148 based out of Piedmont, CA
- Teaching mechanical design and mechatronics skills to students and guiding the competition robot design and fabrication.

2024 2025 IEEE ICRA 2025, Workshop Organizer

Atlanta, GA

- Co organizing two workshops for the International Conference on Robotics & Automation in 2025 in Atlanta, GA
- Workshop topics include "Mechanical Intelligence in Robotics" and "Soft Machines Break Hard Ground"

2021 2022