

Clark TEEPLE

PhD Candidate | Harvard Microrobotics Lab, Harvard University

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I am a robotics researcher with experience in compliant end effector design and system integration. I am interested in applying my creative scientific mindset to solve impactful, real-world problems in robotics.

🎓 EDUCATION

- Dec. 2021** **PhD in Engineering Sciences (Robotics) – Harvard University**, Cambridge, MA
- *Dissertation Title* - Design Principles for Improving Precision and Dexterity of Soft Robotic Hands
 - NSF Graduate Research Fellow
- May 2016** **BSE in Mechanical Engineering – University of Michigan**, Ann Arbor, MI
- 3.90 GPA, Summa Cum Laude

📋 SKILLS






- Mechanical Design** Fusion 360, Solidworks, OnShape, Eagle CAD (Electronics), Basic Machining, **3D Printing**, Design for Manufacturing
- Programming** Python (including NumPy, SciPy, and Pandas), C++ (embedded), MATLAB, Linux
- Robotics Frameworks** Robot Operating System (ROS), MoveIt!, PyBullet Physics, UR5e Robot Arm

👜 EXPERIENCE

- 2016–Present** **PhD Candidate**
- HARVARD MICROROBOTICS LAB** – Harvard University, Cambridge, MA
- Advisor: Prof. Robert Wood*
- Lead the development of a dexterous soft robotic hand platform capable of in-hand manipulation, and developed relevant performance metrics to quantify in-hand manipulation.
 - Investigated several factors in the design of soft robotic hands (*friction, compliance, finger arrangement, etc.*) leading to enhanced capabilities in both grasping and in-hand manipulation.
 - Improved the precision grasping capabilities of soft grippers by developing finger designs that fully-utilize passive compliance.
 - Studied the role of gripper compliance in manipulating fabrics and other thin, flexible objects.
 - Developed Ctrl-P 🐙, a modular, high-bandwidth, smooth pressure control system for soft robots. This system integrates with a robot arm via ROS, and is actively supporting several other research projects.
 - Worked on the development team for the SoMo (Soft Motion) Simulation Framework 🐙, and developed calibration protocols for building and controlling physically-accurate soft robots in simulation.
 - Supervised two visiting Masters students, and three undergraduate projects.
- Dexterous Manipulation Mechanical Design ROS Embedded Programming System Integration Python C++
- 2015–2016** **Undergraduate Research Assisant**
- VIBRATION AND ACOUSTICS LABORATORY : MICROSYSTEMS** – University of Michigan, Ann Arbor, MI
- Advisor: Prof. Kenn Oldham*
- Studied locomotion of small-scale legged robots with multiple sets of high-frequency elastic legs.
 - Designed, built, and characterized several robot prototypes with 3D printed bodies and piezoelectric bending actuators.
 - Contributed to a design-invariant dynamic model of leg and body behavior.
 - *This work resulted in a "Best Paper Award" at the Research, Innovation, Service and Entrepreneurship (RISE) symposium, University of Michigan.*
- Mechanical Design 3D Printing Dynamic Modeling

Summer, 2015	Engineering Intern MIT LINCOLN LABORATORY – Lexington, MA <ul style="list-style-type: none"> Developed control systems and a user interface to automate the operation of a mobile mass spectrometry platform. This platform was used to improve training of canines for explosives detection. Systems Integration UI/UX Design LabVIEW
2013–2015	Undergraduate Research Assisant LAHANN LABORATORY – University of Michigan, Ann Arbor, MI <ul style="list-style-type: none"> Developed a computer-aided design interface to expand the capabilities of the lab’s existing manufacturing process for tissue engineering scaffolds. Used this new interface to design and manufacture interesting and novel scaffold architectures. Systems Integration LabVIEW MATLAB


MENTORSHIP & TEACHING



2021-2022	 Advisor/Supervisor – Undergraduate Senior Thesis, <i>Harvard Microrobotics Lab</i>
2020-2021	 Advisor/Supervisor – Two Undergraduate Research Projects, <i>Harvard Microrobotics Lab</i>
2019-2020	 Advisor/Supervisor – Visiting Masters Student Thesis (EPFL), <i>Harvard Microrobotics Lab</i>
2018-2019	 Advisor/Supervisor – Visiting Masters Student Thesis (ETH-Z), <i>Harvard Microrobotics Lab</i>
Fall 2018	 Teaching Fellow – ES51 - Computer Aided Machine Design, <i>Harvard University</i>

SELECTED PUBLICATIONS



C.B. Teeple, B. Aktaş, M.C. Yuen, G.R. Kim, R.D. Howe, and R.J. Wood, “Controlling Palm-Object Interactions via Friction for Enhanced In-Hand Manipulation”, *IEEE International Conference on Robotics and Automation (ICRA)*, 2022 (In-Review)

C.B. Teeple, J. Werfel, and R.J. Wood, “Multi-Dimensional Compliance of Soft Grippers Enables Gentle Interaction with Thin, Flexible Objects”, *IEEE International Conference on Robotics and Automation (ICRA)*, 2022 (In-Review)

C.B. Teeple, R.C. St. Louis, M.A. Graule, and R.J. Wood, “The Role of Digit Arrangement in Soft Robotic In-Hand Manipulation”, *IEEE International Conference on Intelligent Robots and Systems (IROS)*, 2021 

M.A. Graule, C.B. Teeple, T.P. McCarthy, G.R. Kim, R.C. St. Louis, and R.J. Wood, “SoMo : Fast and Accurate Simulations of Continuum Robots in Complex Environments”, *IEEE International Conference on Intelligent Robots and Systems (IROS)*, 2021  

C.B. Teeple, G.R. Kim, M.A. Graule, and R.J. Wood, “An Active Palm Enhances Dexterity of Soft Robotic In-Hand Manipulation”, *IEEE International Conference on Robotics and Automation (ICRA)*, 2021 

C.B. Teeple, S. Abondance, and R.J. Wood, “A Dexterous Soft Robotic Hand for Delicate In-Hand Manipulation”, *IEEE Robotics and Automation Letters*, 2020  

C.B. Teeple, T.N. Koutros, M.A. Graule, and R.J. Wood, “Multi-Segment Soft Robotic Fingers Enable Robust Precision Grasping”, *International Journal of Robotics Research*, 2020  