

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 robotic manipulation.

🎓 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. <div> Systems Integration UI/UX Design LabVIEW </div>
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. <div> Systems Integration LabVIEW MATLAB </div>


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  