

Clark TEEPLE

PhD Candidate | Harvard Microrobotics Lab, Harvard University

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I am a PhD Candidate in Mechanical Engineering seeking to build robotic hands and manipulation systems that are robust, gentle, and safe in the real world.

🎓 EDUCATION

- (expected) 2021 **PhD in Engineering Sciences (Robotics) – Harvard University**, Cambridge, MA
- *Dissertation Topic* : Design strategies for dexterous soft robotic hands
 - NSF Graduate Research Fellow
- 2018 **MS in Engineering Sciences (Robotics) – Harvard University**, Cambridge, MA
- 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 MICROBOTICS LAB – Harvard University, Cambridge, MA

Advisor : Prof. Robert Wood

- Studied how several aspects of soft robotic hands (finger workspace, finger arrangement, palm morphology) affect their grasping and in-hand manipulation performance.
- Lead the development of a dexterous soft robotic hand platform capable of in-hand manipulation, and developed relevant performance metrics.
- Improved the precision grasping capabilities of soft grippers by developing finger designs that fully-utilize passive compliance.
- Studied the role of gripper compliance in gentle interaction with fabrics, tapes, 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, 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  