

Clark TEEPLE

Postdoctoral Fellow | Harvard Microrobotics Lab, Harvard University

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I am a roboticist with experience designing "gentle" end effectors, and a passion for mechatronics and system integration. I am interested in applying my creative engineering mindset to solve exciting, real-world problems.

🎓 EDUCATION

- Nov. 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 2018 **MS in Engineering Sciences (Robotics) – Harvard University**, Cambridge, MA
- 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**, **Laser Cutting**, 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

2016–2021 PhD Candidate

HARVARD MICROBOTICS 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.
- Developed calibration protocols for building and controlling physically-accurate soft robots in simulation as part of the development team for the SoMo (Soft Motion) Simulation Framework 🐙.
- Supervised two Masters theses, and three undergraduate projects.

Mechanical Design Simulation Embedded Programming System Integration ROS 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 using 3D printing.
- Contributed to a design-invariant dynamic model of leg and body behavior.

Mechanical Design 3D Printing Dynamic Modeling






Summer 2015 Engineering Intern

MIT LINCOLN LABORATORY – Lexington, MA

- 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.

System Integration UI/UX Design LabVIEW

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, 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, 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 Robotics and Automation Letters*, 2022

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

