Clark TEEPLE

PhD | Harvard Microrobotics Lab, Harvard University

🌐 cbteeple.com   🔗 github.com/cbteeple   @ cbteeple@gmail.com   📍 Based in Somerville, MA, USA

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

🎓 EDUCATION

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

📄 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**