COLTER DECKER

(503) 583-6550 • colterdecker@gmail.com • Google Scholar • LinkedIn • Website

EDUCATION

Harvard University — Cambridge, MA
Ph.D. Candidate, Materials Science and Mechanical Engineering — Expected May 2028
NSF Graduate Research Fellow

Rice University — Houston, TX
B.S., *summa cum laude,* Mechanical Engineering — 2023

SELECTED PUBLICATIONS & RECOGNITION

• Two first-author publications in *PNAS*; additional publications in *Cell Reports Physical Science, PNAS, STOTEN, IEEE RoboSoft,* and *IEEE RA-L*.
• NSF Graduate Research Fellow (2023-2026).
• Inventor on WIPO patent for programmable soft actuators (2024).

RESEARCH & ENGINEERING EXPERIENCES

Harvard University, Lab of Prof. Robert Wood — Cambridge, MA
Graduate Research Assistant — control and fabrication of robotic manipulators — Aug 2023 – Present
• Designed robotic finger joints using large-scale **nonlinear optimization** (**first author, *PNAS***).
• Simulated contact-rich manipulation experiments using **Drake** to evaluate candidate gripper designs.
• Developed **MLP, LSTM, and transformer** models for joint state estimation from magnetic data (*IEEE RoboSoft*).
• Engineered **robotic manipulators**, achieving a 3.5x increase in payload capacity (under review).

Rugged Robotics, Houston TX — Summer 2022
Mechanical Engineering Intern — robotic design and control for construction environments
• Discovered and corrected long-standing error in inverse kinematics, reducing wasted steering power by ~50%.
• Developed **sensor fusion** algorithms for cm-level robot localization.
• Iteratively designed laser gimbal to meet stringent thermal, weight, size, and sealing requirements.

Rice University, Lab of Prof. Daniel Preston — Houston, TX
Undergraduate Research Assistant — modeling and building soft and wearable robots — Oct 2019 – May 2023
• Designed and tested new fluidic valves that are capable of mixed-signal computer logic (**first author, PNAS**).
• Created and tested logic-enabled wearable textile actuators and **soft robotic control systems** (PNAS).
• Modeled environmental effects on virus lifetime prediction using **large-scale climate datasets** (STOTEN).

TEACHING & SERVICE

• Teaching Fellow, GENED 1080 – *Engineering the Acoustical World, Harvard* — Fall 2024
• Grader, MATH 212 – *Multivariable Calculus, Rice* — Fall 2021
• Research Mentor – *Microrobotics Lab, Harvard* — 2023 – Present
  • Mentored 4 undergraduate researchers on projects spanning sensors, soft robotics, and manipulation
  • Guided students from initial design to senior thesis and research funding
• Diversity Coordinator, Microrobotics Lab – *outreach, lab tours* — 2023 – Present

TECHNICAL SKILLS

Robotics & Controls: Manipulator design, kinematics, sensing, optimization
Optimization: Nonlinear programming, CasADi, IPOPT
Simulation & FEA: Abaqus, Salome-Meca, Drake
Programming: Python, MATLAB, C++, ROS, OMPL
Fabrication: Rapid prototyping, polymer casting, 3D printing, electromechanical systems