

# Casper Muter

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## EDUCATION

**Boston University.** Boston, MA

September 2023 - August 2024

*Master of Science in Robotics and Autonomous Systems.*

**University of Hartford.** West Hartford, CT

September 2019 - May 2023

*Bachelor of Science in Electromechanical Engineering Technology (Magna Cum Laude).*

## EXPERIENCE

### **Mechanical Engineer**

*Biotex Inc*

February 2025 - Present

- Lead integration of a helmet-mounted human presence detection system, including mechanical and electrical components.
- CAD design of electromechanical assemblies, housings, and tight tolerance components.
- DFM for machined, molded, and printed parts; created drawings applying GD&T.
- Designed, assembled, and programmed electromechanical imaging and sound/vibration test fixtures using machined components and integrated sensors.
- Lead development of sensor integrated medical devices through prototyping, system integration, and testing.

### **Graduate Research Assistant**

*Material Robotics Laboratory at Boston University*

September 2023 - May 2024

- Acquired hands on experience fabricating a soft robotic sleeve for colonoscopy procedures, learning key design constraints and functional tradeoffs.
- Collaborated with clinicians at Brigham and Women's Hospital to conduct NASA Task Load Index assessments, optimized device design based on usability and ergonomic feedback.
- Utilized fabrication methods including laser cutting, UV curing, and uniform polymer coating to support soft robotic device development.

### **Soft Robotics Engineer Intern**

*Morphable Biorobotics Laboratory at Boston University*

May 2024 - August 2024

- Designed and fabricated stacked balloon actuators for a soft robotic octopus used by the navy.
- Developed and tested advanced soft robotic tentacles with customized fiber reinforcements for increased force output and flexibility in underwater manipulation.
- Conducted performance evaluations using a Universal Robot UR5 collaborative robot to simulate operational challenges.

## PROJECTS

### **Oncomagnetics Wearable System**

- Performed electromechanical design for a wearable device, creating CAD assemblies, sensor integrated fixtures, and test jigs while leading development of a helmet-mounted human presence detection system.

### **Smart Laryngeal Mask Airway (LMA)**

- Led mechanical prototyping, sensor selection and design, system integration, and iterative testing for a sensor enabled laryngeal mask airway (LMA).

### **Soft Robotic Sleeve for Safer Colonoscopy Procedures**

- Led prototype development and performance testing for a soft robotic sleeve, innovating silicone molding techniques and optimizing lab equipment use, while conducting force and curvature evaluations using an Instron machine and MATLAB.

### **Cable Driven Soft Glove for Hand Therapy**

- Engineered a soft robotic glove with a team using Dragon-Skin elastomer and cable-driven servo motors for targeted hand therapy, incorporating sensor-based progress tracking for rehabilitative precision.

## PUBLICATIONS

*Soft Robots for Colonoscopy: Monitoring Forces, Increasing Safety, and Reducing Discomfort. Npj Robotics, 2025*

*Soft, Fiber-Reinforced Bellow Actuators. IEEE Robotics and Automation Letters, 2025*

## KNOWLEDGE AND SKILLS

**Hardware:** Mechanical design, rapid prototyping, CAD and DFM for machined, molded and 3D printed parts, GD&T, soft robotic fabrication, sensor and actuator integration, and circuit assembly and troubleshooting.

**Software:** Siemens NX, SolidWorks, MATLAB, Python, C++, OrCAD PSpice, CLICK, LabVIEW, and ROS.

**Languages:** English (Fluent), Polish (Fluent).