HALEY HIGGINBOTHAM

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PROFILE

Extremely dedicated and self-motivated student/athlete/researcher with a passion for creative problem solving and demonstrated skill in engineering and design.

EDUCATION

Massachusetts Institute of Technology **2017-present**
Cambridge, MA

- MS Candidate in Mechanical Engineering
- BS in Bioengineering with a minor in Mechanical Engineering, Class of 21'
- 5.0 GPA
- Certified graduate of the Gordon-MIT Engineering Leadership Program
- Relevant Coursework: Medical Device Design, Hardware Design for International Development, Differential Equations, Design and Manufacturing I & II, Biomedical Signal and Image Processing

SKILLS

- **Computers:** Solidworks & Fusion360 (CAD, CAM, & FEA), Microsoft Office, JAVA, Python, Arduino, Matlab, LabVIEW, Adobe Illustrator
- **Biology:** wet-lab techniques such as pipetting, gel electrophoresis, DNA isolation, and crosslinking
- **Fabrication:** machining, laser cutting, 3d printing, vinyl cutting, glass-working/fusion, soldering, welding, carpentry

RESEARCH EXPERIENCE

MIT Cima Lab **Aug 2021 – present**
Graduate Researcher Cambridge, MA

- Optimizing SNR for NMR sensor via improvements to hardware and signal processing protocols
- Designing & testing a bi-directional microfluidic pumping system for sampling neuropeptides from cranial ISF
- Assisting with cranial implant surgeries in rodent models

MMID: Integrated Product Development Agency **Summer of 2022**
Intern Delft, Netherlands

- Performed concept design and visualization in CAD, analysis via simulation, and prototype testing
- Gained exposure to the workplace dynamics and structure of an international product design consultancy

MIT Langer/Traverso Lab **Sept 2020 – May 2021**
Undergraduate Researcher Cambridge, MA

- Exploring optimal parameters for electrical stimulation of nerve repair
- Performing animal testing and data processing

MIT Center for Biomedical Engineering **Sept 2019 – Sept 2020**
Undergraduate Researcher Cambridge, MA

- Investigated the role of ECMO circuit design in immunothrombosis
- Explored difficult intubation scenarios and potential modifications to contemporary laryngoscopes to improve visualization and manipulation of tissues

Bioelectronics Group, MIT **May 2018 – May 2020**
Undergraduate Researcher Cambridge, MA

- Built a treadmill and trained rats and mice in order to investigate the recovery of locomotor function after spinal cord injury
- Aided in the fabrication of custom neural probes
- Implemented a cloud-hosted neural network to perform motion capture video analysis

BioInstrumentation Group, University of Auckland **Summer of 2019**
Intern Auckland, New Zealand

- Investigated methodologies for characterizing the optical properties of materials for use in soft robotics
- Immersed myself in Kiwi culture

Newman Lab for Biomechanics and Rehabilitation, MIT **Oct 2017 – Dec 2018**
Undergraduate Researcher Cambridge, MA

- Used LabView to interface with a therapeutic robot's NI cRIO controller and adapt the robot to provide a platform for investigating auditory feedback in control of fine locomotor functions

Young Scholars Program (YSP) **Summer of 2016**
Researcher and Student Tallahassee, FL

- Investigated the effects of purmorphamine on chromatin structure at Florida State University (FSU)
- Produced research paper and conference poster, and presented research at public poster session

WORK & VOLUNTEER EXPERIENCE

The Bike Lab **2022 - present**
Co-Founder & VP Cambridge, MA

- Promoting sustainability, safety, and community by teaching bike repair and maintenance

Baker House **2021 - present**
Graduate Resident Advisor Cambridge, MA

- Leading the Resident Peer Mentor Program, providing support to first year students through structured mentorship as well as educational & community-building events

MIT Leadership Training Institute **Spring of 2023**
Project Mentor Cambridge, MA

- Provided guidance and advice to high schoolers as they designed and developed service projects to benefit their communities

MMID **Summer of 2022**
Intern Delft, Netherlands

- Performed tasks pertaining to medical and consumer product design and validation

Greater Boston Food Bank **May 2018 - present**
Volunteer Food Drive Coordinator Cambridge, MA

- Organized service events for the MIT community and end-of-semester food drives benefiting the Greater Boston Food Bank to reduce food waste on campus and help alleviate food insecurity in the local community

MIT Bioengineering Department **Aug 2020 – May 2021**
Volunteer Associate Advisor Cambridge, MA

- Provided academic and life advice for sophomores entering the Bioengineering major

Course: Design and Manufacturing II **Sept 2020 – Dec 2020**
Lab Assistant Cambridge, MA

- Supported the teaching and machine shop staff by facilitating the use of equipment and learning amongst students in the class

Habitat for Humanity **2014 - 2018**
Volunteer Titusville, FL

- Helped build houses for local families in need by learning and performing tasks such as framing, waterproofing, landscaping, and installing insulation

DLEE Designs, LLC. **June 2016 – Sept 2017**
Part-time Private Contractor Cocoa, FL

- Executed proof of concept studies and integration of hardware and software
- responsibilities include software development, data analysis, and 3D modeling

Indian River City United Methodist Church **July 2011-15 & 2017**
Volunteer Teacher/Assistant Titusville, FL

- Led a class of ~25 kindergarteners through 7th graders during a summer program which focuses on teaching youth new skills

AFFILIATIONS

- MIT Women's Lightweight Crew
- The Bike Lab
- MIT Outing Club
- Tau Beta Pi Engineering Honor Society
- Society of Women Engineers

AWARDS/HONORS

2022

- Named to Pocock Racing Shells Lightweight All-America Team
- 1st at Intercollegiate Rowing Association Championship and Head of the Charles
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2021

- Recipient of NSF Graduate Research Fellowship
- Submission accepted to showcase at 2021 Design of Medical Devices Conference
- 1st in Head of the Charles 4+ rowing event

2020

- Picked for U23 U.S. Women's National Rowing Team Selection Camp
- 1st place in U23 lightweight women event at CRASH-B World Indoor Rowing Championships

2019

- Fung Scholar
- Invited to be Master of Ceremonies at Fung Scholars Leadership Conference
- Set MIT record for fastest 2k erg time

2018

- Johnson & Johnson Scholar
- Set MIT record for fastest 5k erg time

2017

- National Merit Scholarship
- NASA College Scholarship
- Brevard Association of School Administrators and Affiliates Scholarship
- Coach Bernie Sher Memorial Scholarship
- Evelyn B. Johnson Memorial Scholarship
- Air Force Technical Applications Center Company Grade Officer Council Scholarship

References Available Upon Request