

MILO J. HOOPER

Mechanical Engineer

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📍 Cambridge, MA

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🐙 github.com/auridian

🔊 AI1XR (Extra)

EDUCATION

S.B. Mechanical Engineering

Massachusetts Institute of Technology

📅 Aug 2017 – May 2021

Coursework

- **Fall 2020**
 - Biomaterials & Tissue Interactions, Photonic Biochemical Sensing, Medical Device Design Capstone, Design of Living Systems
- **Previous Semesters**
 - **Mechanical:** Mechanics and Materials I, Dynamics and Controls I & II, Design & Manufacturing I & II, Thermal-Fluids Engineering I, Biomechanics and Neural Control of Movement, Bio-Inspired Robotics, Measurement Instrumentation, Design of Medical Devices and Implants, Analysis and Design of Feedback Control Systems
 - **Electronics:** Analog Electronics Laboratory, Numerical Computation, Computation Structures

EXPERIENCE

Medical Device Engineering Intern

Eli Lilly Cambridge Innovation Center

📅 Summer 2020

📍 Cambridge, MA

- Electronics and firmware for small connected drug delivery device
 - Circuit schematic and layout for sensor system interfacing with Arm processor + BLE and USB connections
 - Firmware in C++ and Python to control sensors, output data to phone app
 - Sourcing components and ensuring interoperability
- CAD/mech. design of dual chamber diaphragm pump for drug delivery device
 - Optimizing for as-small-as-possible form factor
 - Prototyping with 3D-printed and silicone molded parts
 - Testing pump performance in constrained volumetric filling

Mechanical Eng. Researcher (Space Enabled Research Group)

MIT Media Lab

📅 Summer 2019

📍 MIT, Cambridge, MA

- Designed and machined parts for centrifuge in order to centrifugally cast liquid paraffin for rocket fuel applications.
- Developed electronic control system for small-scale centrifuge with speed and voltage control modes
- Debugged microcontroller components and C++ control code to optimize for performance and reliability

Mechanical Eng. Researcher (Implosion Fabrication Group)

Institute for Soldier Nanotechnologies

📅 Summer 2018

📍 MIT, Cambridge, MA

- Designed and machined z-axis alignment mechanism for ultrafast nanolithography system using SolidWorks and mill/lathe
- Generated MATLAB patterns for laser configuration testing and to provide error data for calibration purposes in various geometries

SKILLS

- Machine tools: thermoforming, mill/lathe, waterjet, laser cutter, 3d printer, hand tools
- Software: SolidWorks, LTSpice, Linux, LaTeX, Altium
- Programming: MATLAB, C++, Python 3, Arduino, mbed (ARM)
- Other: cryogenics handling, Extra class amateur radio license, registered VE with W5YI

LEADERSHIP

President, W1XM (UHF Assn. / MIT Radio Society) (Feb 2020-now)

- Assist with installation of 2m EME Yagi array, repairs of 6m beam on rooftop station
- Major infrastructure renovations negotiations with MIT admins
- Lead fundraising effort and strategic updates meetings in-person and virtually

PROJECTS

Pericardial Adhesion Barrier (Spring 2020)

- Concept development + regulatory research
- Novel barrier utilizing NSAID eluting nanoparticles embedded in spray-on hydrogel to prevent postoperative adhesions

Jumping Leg Robot Experiment (Fall 2019)

- Telescoping leg on boom design for bio-inspired robotics project
- Determine optimal ratio of leg muscle and section lengths for maximal jump height

Electric Scooter (Spring 2019)

- Built a custom scooter using Razor E100 steel frame, A123 LiFePo₄ batteries, Kelly Controller, key ignition, continuous throttle; added front and rear braking

6.101 Project (Spring 2019)

- Idea: use eye muscle EMG for 2-axis servo pointer control
- Involved 4th order Chebyshev filtering, use of instrumentation amps, PWM signals generated from comparators and 555 timer sawtooths

PUBLICATIONS

- Co-Author, "An Investigation of the Centrifugal Casting of Paraffin Wax on Earth and in Microgravity," Joint Propulsion Conference, Summer 2019, American Institute of Aeronautics and Astronautics