

EMMA GRIFFITHS

PORTFOLIO

<https://egriff44.github.io/>

CONTACT

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EDUCATION

MIT `21 – 4.6 GPA

Bachelor of Science in Materials Science and Engineering

Topics included mechanics/structural materials, synthesis/processing, electronic and magnetic materials, embedded processing, PCB design, software/hardware engineering, robotics, project design/fabrication, and human computer interaction. Undergraduate thesis completed.

Hopkinton High School

Class of 2017

AWARDS/CERTIFICATIONS

Digital Badges

AI Fundamentals Practitioner Badge

AI Fundamentals Skills Badge

LANGUAGES

English *native*

Mandarin Chinese *college level*

SOFTWARE

Python - Fusion360/CAD

Unity/C# - Mathematica

Eagle - Rhino - MATLAB

ADDITIONAL SKILLS

AI/ML with Python

PCB Electronic Design

EXPERIENCE – INDUSTRY

Lockheed Martin Space

Materials Engineer

April 2022 - Present

- Additive manufacturing lead responsible for designing and performing experiments and collecting and analyzing data to make part recommendations to programs. This involves understanding the AM process and how various factors such as material, geometry, criticality/risk level, stress margins, and use temperature will influence part performance. Work has resulted in collaboration across business areas and the writing and publishing of numerous Lockheed-wide material, equipment, and process specifications for additive manufacturing.
- Lead for statistical process control implementation for polymer and metal additive manufacturing, making it easier to track machine health and predict out of control behavior before costly and time consuming failures occur. Included the collection of tensile data, statistics-based generation of process control limits, and the creation of a custom data tracking dashboard.
- Developed an augmented reality Unity application with the Collaborative Human Immersive Lab (CHIL) that uses hand tracking to find item storage locations in an Orion-simulated flight cabin, making it easier for astronauts to locate necessary items quickly and preserve the cabin weight distribution.
- Classes completed in composite materials, additive manufacturing, and artificial intelligence/machine learning - including a final project implementing anomaly detection for a multi-class image dataset

Lifespans, Ltd.

Simulation Engineer

2021-2022

- Leveraged knowledge of material properties and testing to design simulated interactions that mimicked real-life material behavior in order to create particle-based simulations to test orthopedic implant designs. These simulations provide accurate force results less expensive and faster than in-person labs to enable a more rapid implant design prototyping process.
- Presented work at a booth at the American Academy of Orthopedic Surgeons (AAOS) conference in 2021
- Worked directly with top orthopedic implant design companies to learn about industry needs and to incorporate stakeholder feedback

EXPERIENCE – RESEARCH

MIT Undergraduate Thesis

Undergraduate Researcher

Department of Materials Science and Engineering

2020-2021

- Performed literary analysis in waterless hand cleanser field, discovering a research gap in finding water-minimal hand cleansers effective at spore-forming bacteria removal to better protect communities lacking water for sanitation from harmful diarrheal and respiratory infections
- Designed and executed experiments (zone of inhibition, simulated handwashing) working with *Bacillus subtilis* to identify which factors of waterless cleansers (such as composition and texture) lead to statistically significant changes in spore-removal performance
- Found that povidone-iodine, the active ingredient used in various over-the-counter antiseptics, was able to provide resistance to the growth/spread of the spore-forming bacteria and that the addition of pumice to a cleanser significantly improved its effectiveness at spore removal

Bioelectronics Group

Undergraduate Researcher

MIT Research Lab of Electronics

2019-2020

- Fabricated soft/flexible and implantable bioelectronic devices to test the efficacy of light stimulation for spinal cord repair and intrinsically stretchable bioelectronic devices for interfacing with the central and peripheral nervous system to better understand the communication between the gut and brain
- Developed mechanisms for testing device performance and performing quality control

Center for Condensed Matter Sciences

Research Assistant

National Taiwan University, Taipei, Taiwan

Summer 2019

- Synthesized perovskite solar cell materials and collaborated with a team of engineers from around the world
- Collected data using mass spectrometry and analyzed solar cell thermal and

Robotics
Product Design and Fabrication
Experiment Design
Project Management
Technical Writing and Communication
Data Analysis
AR/VR Unity Design

photo-degradation pathways to understand temperature and light's impact on the perovskite solar cells and their ability to produce energy

Human Systems Laboratory 2018-2019
Undergraduate Researcher MIT AeroAstro

- Developed gestural controls for SPHEREs satellites, making it possible to interface with and control the satellites with Microsoft HoloLens augmented reality via Unity in order to investigate how immersive technology can improve an astronaut's spatial awareness when performing extravehicular activities
- Designed training program to onboard users with the SPHEREs/HoloLens technology

EXPERIENCE – LEADERSHIP/OTHER

Night Lights Volunteer 2023-2024

- Monthly role providing free respite care for children who have special needs and their siblings to give parents and caregivers the opportunity and time to take care of themselves and refresh

MIT Afterschool-Tastic Mentor 2020-2021

- Mentored and taught 150 underserved middle and high school students in the greater Boston area; planned lessons in topics in science and technology as well as team building, creating thinking, and world building

Camp Kesem Counselor 2017-2021
Outreach Coordinator (2018-2019)

- Served as a counselor, outreach coordinator, and admin team member; planned and publicized various group events to our large community comprised of families impacted by cancer; grew our community by working with underserved areas in greater Boston