Madeleine Weaver

MaddyWeaver.github.io mweaver2@andrew.cmu.edu
linkedin.com/in/madeleine-weaver 781-591-1292

Education

Carnegie Mellon University (CMU) Pittsburgh, PA
Master of Science Mechanical Engineering - Research; Concentration in Robotics; GPA:3.7 *May 2024*

AiPEX Graduate Researcher, BRIDGE Scholar

Courses: Machine Learning and Artificial Intelligence for Engineers, Computer Vision, Biomechanics of Human Movement, Bioinspired Robotics

Northeastern University (NEU) Boston, MA
Bachelor of Science Electrical and Computer Engineering; GPA: 3.5/4.0 *May 2022*

Silicon Synapse Undergraduate Researcher, NASA Big Idea Challenge Electrical Team Lead, SPOWER Scholar

Skills

Programming:	Python, HTML, C++
Fabrication Skills:	MIG Welding, Micro-Soldering, 3D Printing, Laser Cutting, Casting and Molding, Electrical Systems Assembly, Manual Machining
Software:	SolidWorks, MATLAB, LabView, Blender, Unity, Altium, Adobe Premiere, Adobe Photoshop

Research Experience

AiPEX Lab (CMU) Pittsburgh, PA
Humanoid Robotics and Applied AI Graduate Researcher *July 2022 - Present*

- Developed and performed classroom demos using virtual reality and motion capture to control humanoid robot digital twin for Humanoid Robotics and Cognition; wrote python scripts to enable students to optimize performance in open-ended assignments
- Researched methods to implement machine learning control algorithms for humanoid robots to enable realistic and social context-informed facial expressions, speech and gestures; considered work from both artistic and scientific communities
- Investigated use of biomechanical models in improving fidelity of humanoid hardware

Silicon Synapse Lab (NEU) Boston, MA
Undergraduate Researcher *September 2019 - May 2021*

- Worked on a team to design PCB for bio-mimetic bat robot; selected individual components and finalized layout for production
- Learned from online documentation to program STM-32 processor chip and successfully accessed sensors, indicator LEDs and motor drivers
- Soldered surface mounted components to flexible PCB under a microscope rendering the circuit functional
- Innovated methods for mounting PCB traces to carbon fiber chassis to reduce total weight
- Contributed resulting hardware to Bat robot versions serving as basis of at least 3 publications

MxR Lab (USC) Los Angeles, CA
REU Undergraduate Researcher *May 2018 - July 2018*

- Created augmented reality environment to measure effect of immersion on decision making when confronted with ethical dilemma on a team of three
- Modeled virtual objects in Blender including lever and built corresponding physical lever with integrated sensors for use in data collection
- Contributions to experimental environment made poster submission "Advancing Ethical Decision Making in Virtual Reality" possible, won Best Poster Honorable Mention at IEEE VR Osaka

Professional Experience

FGC Plasma Solutions Cambridge, MA
Electrical Engineer Co-Op *July 2021 - December 2021*

- Designed and executed high voltage plasma experiments, analyzed data to inform product design
- Assisted in the design and assembly of the electromechanical system in a TDLAT (Tunable Diode Laser Absorption Tomography) project
- Designed and assembled 100+ component controls system for larger aerospace project, programmed operation using LabView
- Handled purchasing and accounting procedures independently while ordering components used in electrical subsystem; kept records of lead times and vendor contact information to ensure meeting assembly deadlines

Hasbro Pawtucket, RI

Animatronics Engineer Co-Op *July 2020 - January 2021*

- Designed and fabricated animatronic and electronic toy prototypes for concept review
- Employed conceptual knowledge of physics and electrical design to complete projects based on wireless power transfer and analog signal processing, employed practical knowledge of Arduino programming and servo model construction to create low-cost but memorable effects
- Presented 10 product pitches individually and 2 in a group, including graphics and animations edited in Adobe Photoshop and Premiere
- Contributed to development of concept and prototype for competition-winning team product pitch, product was considered for development

Diversified Technologies Bedford, MA

Electrical Engineer Intern *May 2019 - September 2019*

- Updated 15-year-old piece of equipment used within the company as diagnostic equipment for validating custom PCBs developed for control of high voltage systems
- Programmed PLDs, replaced archaic PCB hardware, designed and tested entirely new PCB using PADS, drafted a wiring schematic and 3D modeled the containing box to be machined
- Independently performed systems assembly to finalize product, which is utilized as one of only two such pieces of equipment to test every PCB manufactured by the company

Academic Projects

Articulated Mouth Robot Boston, MA - Pittsburgh PA

Northeastern University, Carnegie Mellon University *Spring 2021 - Present*

- Created robotic mouth capable of mechanically actuating human-like speech sounds using a speech classifier and RL network
- Based hardware design on design created by Professor Hideyuki Sawada from Kagawa University in Japan, integrated soft-robotic pneumatic actuators for improved articulation

Jellyfish-Inspired Robot Pittsburgh PA

Carnegie Mellon University *Spring 2023*

- Designed, fabricated and evaluated robot for observing sea life with jellyfish-inspired propulsion mechanism to reduce environmental disturbance
- Won Best Overall Project at course expo