

## EDUCATION

### CARNEGIE MELLON UNIVERSITY – Pittsburgh PA

Dec. 2025

Master of Science in AI Engineering – Concentration in Robotics and Controls, GPA 3.82 / 4.00

Select Coursework: On Device Machine Learning, Intro to Machine Learning, Systems and Toolchains, Numerical Methods, Deep Learning, Generative AI and LLMs, Machine Learning with Large Datasets

### UNIVERSITY OF PITTSBURGH – Pittsburgh PA

April 2024

#### Swanson School of Engineering – Honors College

Bachelor of Science in Mechanical Engineering, Summa Cum Laude, Honors Distinction Degree, GPA: 3.93 / 4.00

Select Coursework: Cyber Physical Systems, Robotic Control, Mechanical Design, Mechanical Vibrations, Data Structures and Algorithms, Design in Simulation, Microeconomic Theory, Macroeconomic Theory, Game Theory, World History

## PROJECTS

### On Device Single Image Super Resolution for iOS – Pittsburgh PA

Sept. 2024 – Present

- Adapted and compressed off-the-shelf SwinIR model for single-image super-resolution (SISR) for an iPhone 16 Pro Max device
- Explored various quantization approaches (static, dynamic, mixed-precision) to reduce model size
- Transitioned from PyTorch quantization to CoreML-based quantization strategies aligned with Apple's hardware capabilities
- Leveraged FP16 strategies to achieve smaller model sizes and faster inference while preserving image quality, and demonstrated that structured attention head pruning (via L1-norm) outperforms unstructured pruning
- Combined pruning and CoreML-based quantization to yield a smaller, more efficient, hardware-optimized model for iOS devices
- Benchmarked model efficiency in latency, energy usage, and FLOPs on target hardware, optimizing for mobile compatibility and privacy by avoiding cloud dependencies

### Cloud-Enabled MQTT Data Analytics and Attack Classification System – Pittsburgh PA

Sept. 2024 – Present

- Developed a PostgreSQL database schema for MQTT data ingestion and analytics, handling over 20 million data points while performing end-to-end data ingestion, cleaning, and schema population tasks
- Built and compared machine learning models in Spark (Logistic Regression, Random Forest) and PyTorch (Shallow and Deep Neural Networks) for multi-class attack prediction, tuning hyperparameters and evaluating model performance on test data
- Deployed project to Google cloud, demonstrating code functionality, cloud data ingestion, and ML model evaluation, achieving proficiency in cloud-based deployment and database management

### Cyber Physical Systems Robot – Pittsburgh PA

Jan. 2024 – April 2024

- Programmed a mobile robot that can optimally track a line and avoid obstacles using finite state machines and interrupts
- Utilize knowledge of sensor control with microcontrollers through a network and cloud
- Explore topics such as electronic design, embedded programming, digital signal processing, network and information theory, wireless communication, and big data analytics

### A Robotic System for Tracking the Ulnar Nerve – Pittsburgh PA

Jan. 2023 – April 2023

- Led and collaborated with four other students to design and construct a 6-DOF robotic arm that moved on a 2D plane with an ultrasound sensor end effector that could help medical professionals research the cause of ulnar nerve entrapment
- Developed MATLAB software using forward kinematics that spatially tracked and graphed the real time location of the robotic arm and location of the end effector over time
- Fabricated 6DOF arm components in SolidWorks to allow customization and quick iterations and spec'd needed hardware
- Won 1st place at the expo out of 23 other Mechanical and Material Science Engineering teams

## EXPERIENCE

### ESTAT Actuation – Pittsburgh PA

June 2022 – April 2024

#### Senior Mechanical Engineer Co-op

- Developed lightweight exotendon device for pilots in High G maneuvers to mitigate neck fatigue and injury for the DHA over the course of Phase I and Phase II SBIR by taking design from cradle to multiple prototypes to a final product state
- Saved company time and money by designing, building, and programming test stands that enabled high speed testing as well as rapid wear testing for the first time to screen materials and aid in pushing R&D forward for new use cases
- Designed, produced, and tested clutch and housing prototypes for internal research and large contracts
- Implemented lean frameworks as Product Process Manager to continuously optimize product development
- Assisted in authoring the grant application ultimately securing \$1.1 million of funding
- Sourced specialized materials to push product development forward through internal research and product performance
- Attended conferences as a company representative to market and gauge industry interest

## SKILLS

- Programming**: Python, C++, Embedded Programming, MATLAB
- Data Engineering / Machine Learning**: PostgreSQL, PyTorch, TensorFlow, Spark ML, Kafka, Neo4J, EdgeML
- Engineering**: SolidWorks, Fusion 360, ANSYS Workbench, FEA, Simulink, Mechanical Design, Electrical Assembly
- Awards**: Eagle Scout Award