

WORK EXPERIENCE

Rivian (via RV-Tech)

Palo Alto, CA

Embedded Software Engineer (Intern)

June 2025 - August 2025

- Pioneered Rivian’s first automated diagnostics system for embedded vehicle software, analyzing recorded sensor data and system logs to detect failures and regressions during CI and release testing; Hosted the system on AWS servers, integrated Databricks.
- Developed an automated root-cause analysis pipeline that correlated sensor recordings with embedded and connectivity logs, accelerating release validation and eliminating manual triage.
- Designed a **scalable cloud architecture** that supports parallel analysis across embedded programs and can expand to HIL systems.

Samsung Research America - Think Tank Team

Mountain View, CA

Embedded Systems Engineer

August 2023 - December 2023

- Prototyped an AI assistant earbud by designing a PCB around a Qualcomm processor and integrating Qualcomm REX RTOS.
- Built a low-latency Voice Activation Detection algorithm using FFT; integrated into the REX RTOS to reduce the latency.
- Designed a bidirectional voice pipeline under strict latency constraints to enable real-time conversational interaction.

Amazon Robotics

North Reading, MA

Robotics Software Engineer (Intern)

May 2022 - August 2022

- Developed a digital-twin of an Amazon warehouse station in Isaac Sim, simulating robots with rigid-body-dynamics and photorealism.
- Eliminated 100% of collision risks and operational costs of dedicated training facility by transitioning operator onboarding to simulation-based workflows.
- Extended Isaac Sim’s source code by implementing VR integration, including custom 3D transformation functions and input interfaces.
- Engineered high-fidelity robot trajectory generation using trapezoidal velocity profiles and S-curves with jerk limits.

Tufts University

Medford, MA

Research Engineer

December 2023 - May 2024

- Integrated LiDAR into research platforms, developed STM32 firmware for real-time sensor interfacing, and mentored 2 students.

Research Engineer

2021 - December 2023

- Built and deployed an automated sensor fabrication device for Tufts NanoLab, enabling on-demand production of quality tension sensors.
- Accelerated prototyping cycles from weeks to hours and ensured reproducible sensor characteristics critical for research.
- Designed an interrupt-based stepper motor controller and a real-time PID controller to regulate sensor tension in embedded C.
- Presented the project at [MRS-Boston \(Tufts News\)](#); published it as first author at MDPI ([Publication Link](#))

SELECT PROJECTS

RL Robotics Autonomy System (Simulation & Sim-to-Real) – Northeastern University

Oct 2025 – Present

- Leading the development of a MuJoCo-based simulation for evaluating RL control policies on high-DOF mobile manipulators, surface sim-to-real failure modes (localization drift, contact dynamics) on physical robots. Targeting publication at IROS.
- Designed an autonomy stack for Stretch 2 (with ROS2), implementing LiDAR-based SLAM (with AMCL), and autonomous docking.
- Implemented Jacobian-based inverse kinematics for high-DOF manipulation, enabling precise end-effector control for grasping tasks.

Precision Servo Control System with Force Feedback ([Project Link](#))

- Developed an end-to-end real-time embedded system that converts DC motors into precision servos via closed-loop control.
- Implemented a 1kHz PID controller with $< 50\mu s$ latency and trapezoidal trajectory motion generator in C on STM32.
- Integrated current sensing for torque feedback; implemented high-frequency filtering and cyclic buffering to enable impedance control.
- Designed and fabricated a PCB featuring an H-bridge and UART/I2C; validated performance under sensor noise and fault conditions.
- Designed drop-in motor controller enabling rapid integration into robotic systems, eliminating months of development effort.

Real-Time Procedural Environment Engine | C++, OpenGL, GLSL ([Project Link](#))

- Architected a procedural spherical terrain engine in C++/OpenGL; Implemented a multi-octave Simplex noise to generate Brownian Motion surfaces. Optimized spatial queries by building a hashmap-based indexing system, achieving O(1) complexity for mesh triangle lookups.

TECHNICAL SKILLS

- Hardware & Embedded:** STM32, ESP32, Motor drivers (brushed/brushless), PCB design (Altium, KiCad), Sensor integration (encoders, force sensors, IMUs), I2C, SPI, UART, CAN, Atmel, Xilinx FPGA, VHDL, SystemVerilog, SMD soldering, Fusion360, Assembly
 - Software & Simulation:** C/C++, Python, MATLAB, Git/Gitlab, ROS2, RTOS, PID/impedance control, MuJoCo, NVIDIA Isaac Sim, PyTorch, Unreal Engine, Unity, JavaScript, MicroPython, SQL, OpenGL
 - AI and Robotics:** PyTorch, RL, MuJoCo, Isaac Sim, 2D/3D SLAM, GTSAM, Kalman Filter, Factor Graphs, Inverse Kinematics

EDUCATION

Northeastern University

Boston, MA

Master of Science in Robotics

2024 - May 2026

- Reinforcement Learning, Feedback Control Systems, Geometric Deep Learning, Autonomous Field Robotics (3D SLAM, Kalman Filters, Sensor Fusion, GTSAM, Factor Graphs), Legged Robotics (Bipedal locomotion)

Tufts University

Medford, MA

Bachelor of Science in Electrical and Computer Engineering

2019-2023