

Education

University of Massachusetts Amherst

Bachelor of Science in Computer Engineering

Amherst, MA

Graduated May 2025

- **Coursework:** Low-Power Embedded Systems, Networked Embedded Systems, Computer Architecture, Digital Design, Systems Programming, Synthesis & Verification of Digital Systems, Artificial Intelligence

Technical Skills

Embedded Development: C, ESP32/STM32/nRF52 SDK, FreeRTOS, interrupt-driven programming

Hardware Design: KiCad, oscilloscope debugging, I2C/SPI/CAN/UART, BLE, soldering/rework

Software: Python, C++, MATLAB, Bash scripting, Git, Linux, Fusion 360, OpenCV, Quartus Prime

Experience

Dynamic and Autonomous Robotic Systems Laboratory

Robotics Research Engineer

Amherst, MA

November 2025 - Present

- Designed a distributed 48V motor control architecture for the Dash humanoid robot, developing 6-layer STM32-based controller PCBs with copper power planes, low-inductance grounding, and CAN bus networking for 12+ joint actuators.
- Redesigning the 48V power distribution system (400A peak) for the PresToe humanoid robot, integrating MOSFET power stages, transient protection, Hall-effect current sensing, and STM32 CAN telemetry for real-time monitoring.

Coherent Corp.

Controls and Electrical Engineering Intern

East Granby, CT

June 2024 - August 2024

- Assisted in complete controls upgrade of fibre manufacturing equipment, resulting in improved operational efficiency
- Debugged Allen-Bradley PLC measurement error caused by counter overflow; implemented hybrid solution using DINT counter with float variable conversion to prevent precision loss while maintaining accuracy, and cutting fiber scrap

Riccio College of Engineering

Undergraduate Teaching Assistant

Amherst, MA

Various Courses

- Assisted in Physical Computing, ECE Junior Design, and Security Engineering courses; guided 50+ students through bare-metal C programming, hardware debugging, and secure embedded system design

Projects

Autonomous Workspace Organizer Robot | *KiCad, Fusion 360, BLE, Object Detection*

Senior Design Project

- Designed custom ESP32-S3 control PCB (4-layer, USB-C, onboard level shifter) integrating 5V boost converter with BMS; powering Parallax 360 degree continuous rotation servos driving custom designed tracked-based chassis
- Implemented BLE protocol between robot and overhead NVIDIA Jetson Nano running object detection via OpenCV
- Integrated custom-trained YOLOv8 instance segmentation model (via Roboflow) with camera calibration (12x8 chessboard, 2.1cm squares); achieved reliable object classification for 5-10 items

FreeRTOS based Multi-Sensor Data Logger | *ESP32, FreeRTOS*

- Developed FreeRTOS-based system with 5 concurrent tasks managing multi-rate sensor acquisition (100Hz, 1Hz, 0.5Hz) with mutex-protected shared I2C bus; implemented real-time sensor data logging to an SD card for behavior analysis
- Resolved priority inversion causing IMU sample loss when lower priority task held mutex during 150ms blocking reads, through timeout adjustments and task scheduling modifications

Ultra-Low-Power Weather Station | *C, Nordic nRF52832, ePaper display*

- Designed weather monitor on nRF52832 using Waveshare 2.13" ePaper display and environmental sensors via I2C
- Implemented barometric pressure trend analysis using 30-minute circular buffer; calculating thresholds for prediction

Organizations

Liaison - Institute of Electrical and Electronics Engineers (IEEE)

March 2024 - March 2025

- Organized 5+ events with engineering organizations, facilitating technical workshops and industry speaker sessions

Electronics Co-Lead - UMass Mechatronics Team (ASME)

September 2023 - May 2024

- Co-led electronics subteam for Mini-Golf Robot; integrated dual-arm swing mechanism using NEMA23 stepper motors with M542C precision drivers for torque-controlled putting and chipping, contributing to team's top-5 placement
- Implemented Bluetooth control system using Bluepad32 library with Xbox One controller input mapping; developed Arduino firmware for drivetrain control (L298N H-bridge driving DC motors) and swing actuation