

# Ishaan Salian

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## 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**

Amherst, MA

*Robotics Research Engineer*

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.**

East Granby, CT

*Controls and Electrical Engineering Intern*

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**

Amherst, MA

*Undergraduate Teaching Assistant*

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