Ishaan Salian

413-430-9306 | isalian@umass.edu | LinkedIn | ishaansalian.github.io/Portfolio

Education

University of Massachusetts Amherst **Amherst, MA**
Bachelor of Science in Computer Engineering **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**

- Supported complete controls upgrade of fiber manufacturing equipment alongside senior engineers, improving line uptime and operational efficiency
- Debugged Allen-Bradley PLC counter overflow that was causing false fiber measurements and material scrap, implementing hybrid DINT-to-float conversion that maintained measurement precision across the counter's full range

Projects

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

- Built vision-guided desk-organizing robot by leading the mechatronic development of a 4-layer ESP32-S3 control PCB with onboard 5V converter and BMS, and modeling compact tank-track chassis driven by continuous rotation servos
- Implemented closed-loop position control where an overhead Jetson Nano runs YOLOv8 object detection and sends movement commands over BLE, using the robot's ArUco marker to correct for positioning drift and servo backlash
- Trained a custom YOLO instance segmentation model on 5-10 common desk objects through Roboflow, then integrated it with camera calibration using a 12x8 checkerboard to transform pixel coordinates into robot movement commands

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
- Debugged priority inversion issue where the low-priority environmental sensor task held the I2C mutex during blocking reads, causing the high-priority IMU task to miss its sampling deadline and drop data

Mini Golf Robot | *Ranked 5th out of 20+ Teams* **UMass Mechatronics Team (ASME)**

- Co-led electronics subteam for competition robot, integrating dual NEMA23 stepper motors with M542C precision drivers to achieve torque-controlled putting and chipping swings
- Designed wireless control system by Xbox One controller, mapping joystick inputs to drivetrain commands and button presses to swing actuation sequences
- Wrote firmware controlled L298N H-bridge motor drivers for the drivetrain and precisely timed stepper sequences for swing execution during competition rounds

Leadership & Teaching

Riccio College of Engineering **Amherst, MA**
Undergraduate Teaching Assistant **Various Courses**

- Assisted in Physical Computing, ECE Junior Design, and Security Engineering courses; supporting 250+ students through bare-metal C programming, hardware debugging, and secure embedded system design

Engineering Societies Liaison (UMass Amherst IEEE) **March 2024 - March 2025**

- Organized 5+ technical workshops and industry speaker events by coordinating with various engineering organizations