

JULIAN MONTOYA

julianmontoyb@gmail.com | linkedin.com/in/julian-montoyab/ | <https://github.com/julianmontoyab>

PROFESSIONAL SUMMARY

Aspiring embedded systems engineer with practical experience in microcontroller programming, sensor interfacing, and real-time robotics development. Skilled in low-level systems design using C/C++ and Python, specializing in GPIO programming, precision timing control, PWM-based motor control, and real-time interrupt handling.

Demonstrated leadership through a CIA-sponsored autonomous robotics project and as Vice President of IEEE at FSU. Known for strong communication, adaptability, time management, and a proactive, solution-driven mindset.

TECHNICAL SKILLS

- Leadership & Project Management
 - Embedded Systems & Hardware
 - Microcontrollers: MSP430, STM32, ESP32, Raspberry Pi Pico
 - Interfaces: GPIO, ADC/DAC, UART, SPI, I2C
 - Software
 - Operating Systems: Linux, Unix, RTOS
 - Languages: C, C++, Python, MATLAB, VHDL, SQL
- Tools: Git, Hardware Debugging, Oscilloscope, Logic Analyzer

PROJECTS

Technical Project Lead & Embedded Software Engineer

Senior Design Team

Linux-Based Embedded Systems Development (CIA-Sponsored Project)

Aug 2024 – May 2025

- Led the development of a Linux-based embedded system for an aquaponic farm, combining C++ and Python to control a hybrid stepper motor and LiDAR sensor, enabling full plant bed scans with data transmitted to a Google Cloud server for crop identification using a machine learning model
- Utilized MQTT and SSH protocols to enable remote connectivity to the farm system, providing full 24/7 access for real-time monitoring and more accurate crop predictions, even in weather-constrained environments

Lead Embedded Systems Developer – Hybrid Stepper Motor

Jan 2023 – May 2023

- Managed a team of electrical engineering students to design and build an object-lifting machine capable of raising a 50 g payload in 6 seconds by generating precise PWM signals on an MSP430 microcontroller to drive a hybrid stepper motor through an H-bridge driver, with all firmware implemented in C
- Integrated an additional light sensor to enhance interface control, employing I2C communication and hardware interrupts to control the direction of the hybrid stepper motor

Autonomous Maze-Navigation Robot

Aug 2023 – Dec 2023

- Engineered an autonomous line-following robot using an MSP432 microcontroller by programming IR sensor input and PWM motor output control, enabling the robot to navigate and complete a maze autonomously
- Implemented a C++ PID control algorithm for wheel actuation, optimizing closed-loop motor response and achieving smoother trajectory tracking, which reduced maze completion time by up to 30%

LEADERSHIP

Institute of Electrical and Electronics Engineers

Tallahassee, FL

Vice President

August 2023 – May 2025

- Obtained \$5,000 sponsorship from Micron Technologies by demonstrating innovative Raspberry Pi embedded systems projects that drove increased student engagement in hands-on development activities.

EDUCATION

Florida State University

June 2019 - May 2025

Bachelor of Science in Computer Engineering