JULIAN MONTOYA

julianmontoyb@gmail.com | linkedin.com/in/julian-montoyab/ | https://github.com/julianm-7

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, with a strong foundation in UART, SPI, and I2C communication protocols. Demonstrated leadership through a CIA-sponsored autonomous robotics project and as Vice President of IEEE at Florida State University. Known for strong communication, adaptability, time management, and a proactive, solution-driven mindset.

TECHNICAL SKILLS

- Leadership & Project Management
- Embedded Systems & Hardware
  - Microcontrollers: MSP430, STM32, Raspberry Pi Pico
  - Interfaces: GPIO, ADC/DAC, UART, SPI, I2C
- Software
  - Operating Systems: Linux, Unix
  - Languages: C, C++, Python, Matlab, VHDL
  - Frameworks: ROS, Flask, FreeRTOS
- 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

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%

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

LEADERSHIP

Institute of Electrical and Electronics Engineers **Tallahassee, FL**

Vice President August 2023 – May 2025

- Secured a $5,000 sponsorship from Micron Technologies by presenting a technical proposal and leading Raspberry Pi–based embedded systems projects to increase student engagement in embedded development.

EDUCATION

Florida State University June 2019 - May 2025

Bachelor of Science *in* Computer Engineering