Alejandro Ramirez

Email |956 293 7726 | GitHub | LinkedIn

Skills

- **Languages:** C, C++, Assembly, Python, JavaScript, HTML
- **Technologies:** API Development, Git, FreeRTOS

Experience

Embedded Software developer, IEEE Region 5 Robotics Competition — Brownsville, Tx

Embedded Systems|Microcontrollers|UART|Python|C++|ROS — Dec 2024 – April 2025

- Developed 5+ optimized algorithms improving robotics efficiency by 20% allowing faster sensor response, smoother actuator control, and more reliable autonomous behavior.
- Designed custom data structures that reduced system processing time by 30%, enabling faster response under time-critical sections.
- Led subsystem integration testing to ensure safe toggling of new hardware modules under constraints.

Projects

Raminox, Personal Project Team Lead — July 2025 – Present

C|C++|FreeRTOS|PWM|I2C|I2S|ADC

- Lead a 4-person team developing a custom ESP32-based platform that functions as a portable, wireless communication device, enabling text-like messaging and interactive applications in dead zones.
- Engineered modular software architecture supporting real-time user interaction, multiplayer gaming, and resilient peer-to-peer data exchange using direct radio protocols.
- Designed and implemented core system components for device initialization, error handling, and dynamic UI, emulating key features of a computer in a compact, embedded form factor.

RetePulse, Webserver for managing multiple IoT devices — July 2025 – Aug 2025

Python|Javascript|React|MQTT|OTA|SQL Lite|Linux

- Architected a subsystem-oriented Flask backend, incorporating MQTT for low-latency, bidirectional messaging between host and up to 10 client devices for monitoring their state.
- Implemented a responsive, Vite-powered React frontend, providing intuitive interfaces for device control, firmware upload workflows, and real-time dashboard visualization for users.

MicroUSC, UART Drivers & Memory Management — Mar 2025 – July 2025

C|FreeRTOS|UART|Assembly

- A lightweight, modular embedded framework for ESP32 microcontrollers, designed to streamline UART driver orchestration and enable deterministic serial communication using fixed-size binary commands.
- Integrated the Universal Serial Controller (USC) subsystem as the central interface for UART, memory management, and command routing. The subsystem supports developer-define command sets, allowing customization of device behavior while maintaining deterministic execution.

Organizations

Institute of Electrical and Electronics Engineering, member — Aug 2024 – Present

- Participated in technical workshops and collaborative engineering projects.

Education

The University of Texas Rio Grande Valley — Edinburg, Tx

BS in Computer Engineering — Anticipated Grad. Date: May 2027