

Luis Martinez

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EDUCATION

University of Texas Rio Grande Valley

Bachelor of Science in Computer Science

Edinburg, TX

Aug. 2026

EXPERIENCE

Avionics Lead / Flight Software Engineer

Sept. 2024 – Aug. 2026

Rocket Launchers at UTRGV

Edinburg, TX

- Led the avionics subteam across flight software, embedded hardware, telemetry, integration, and testing, coordinating work across the team to bring avionics from development through flight readiness.
- Worked closely with structures, propulsion, and recovery leads to resolve cross-subsystem constraints including avionics placement, motor and coupler-bay geometry, shared power, recovery interfaces, and vehicle integration.
- Translated requirements and tradeoffs between software, electrical, and mechanical teammates into implementable interfaces, test plans, and integration decisions, helping different disciplines converge on a flight-ready system.
- Built and validated the original MARV embedded stack in Rust/Embassy on RP2350-class MCUs, integrating IMU, magnetometer, GNSS, and barometer data with telemetry/logging, EKF/ESKF state estimation, control logic, and bench/environmental testing.
- Integrated and flight-tested avionics on the team's L3 rocket, capturing synchronized sensor and telemetry data for post-flight analysis.

IT Analyst

Nov. 2022 – May 2024

Sky IT Group

Weslaco, TX

- Resolved hardware/software and network issues for small businesses; supported Ubiquiti WISP deployments, VPN configuration, and automated MSSQL backup workflows.

PROJECTS

MARV V2 — Flight Software, GNC & Avionics | *C++, RP2354B, Gazebo, Web UI, MPC*

- Re-architected MARV as a simplified C++ successor to V1, addressing firmware and PCB limitations while centering the system on the modular GNC architecture developed in Avionics Toolbox.
- Validated multirotor flight in simulation and built a web-based control interface for waypoint navigation and controller-based navigation.
- Added model predictive control (MPC) support for rocket air-brake apogee-control development and maintained modular estimator/controller interfaces for multiple vehicle types.
- Designed the RP2354B flight-controller PCB revision to address V1 hardware shortcomings and support modular external sensors, radios, actuators, and payload electronics.

L3 Rocket Simulation & MCU Validation | *Python, RocketPy, OpenRocket, MAVLink, UART, PyQt5*

- Collaborated with the team's mechanical engineers to translate their OpenRocket vehicle geometry into a RocketPy model, generating time-synchronized simulated IMU, barometer, GNSS, and ground-truth kinematics.
- Streamed simulated sensor measurements into the physical payload microcontroller over UART/MAVLink to exercise real firmware, estimator/event logic, and altitude-triggered servo deployment against the simulated flight.

Avionics Toolbox | *GNC Architecture, Simulation, Technical Reference*

- Built a modular GNC reference and architecture that separates vehicle models, estimation, guidance, control, and actuator interfaces; used the architecture as the design basis for MARV V2.

SENTINEL Rocket Telemetry Visualizer | *Tauri, Rust, TypeScript, three.js*

- Built a desktop telemetry visualization application for the Brunito flight computer using Tauri with a Rust backend and TypeScript frontend.
- Parsed the team's early custom telemetry format and rendered live rocket flight data, including vehicle attitude, trajectory, and mission-state information for operator monitoring and post-flight review.

TECHNICAL SKILLS

Languages: C++, C, Rust, Python, Bash, JavaScript/TypeScript

Embedded/Flight Software: RP235x, Embassy, FreeRTOS, SPI, I2C, UART, DMA, interrupts, state machines, sensor pipelines, telemetry/logging, fault handling

GNC/Simulation: EKF/ESKF sensor fusion, quaternion attitude, cascaded PID, MPC, control allocation, Gazebo, Webots, RocketPy, OpenRocket

Development: Linux/CLI, Git/GitHub, Docker, VS Code, unit/integration testing, simulation-driven validation

AI-Assisted Tooling: Claude Code, Codex, OpenCode, agent/subagent workflow harnesses