Andrew Alvarez

📞 (956)429-8540 | ✉ Andrew.alvarez616@gmail.com| 🔗 https://www.linkedin.com/in/andrewalvrz/|

EDUCATION

The University of Texas Rio Grande Valley (UTRGV)
Bachelor of Science in Computer Science $\qquad$ Expected: Fall 2026

Relevant Courses: CS 1, CS 2, Mathematical Foundations of CS, Computer Org/Assembly, Digital Systems Engineering I,

TECHNICAL SKILS

- Proficient in: C, C++, Python, JavaScript/React, TypeScript, Rust, SQL, HTML, CSS, SPI, I2C, UART, Microsoft Office, Digital/Analog circuit analysis, MATLAB, Digital Multimeter, Data Acquisition Systems (DAQ), Linux, Unix, PowerShell, Git, GitHub, Gitlab , Grafana, Jira, Kubernetes, Unit Testing and Docker, React Bootstrap, React Query, Spring Boot, REST API's , Agile

PROFESSIONAL EXPERIENCE

Software Engineer Intern | Dark Hive $\qquad$ May 2025 – Present

- Working on building secure DevSecOps infrastructure for a U.S. Department of Defense (DoD)-compliant platform. The product supports the streamlined build, test, and deployment of accredited robotics autonomy software to edge systems under a continuous Authority to Operate (cATO) framework. Contributing to front-end and/or back-end components within a fleet management system designed for high-security, mission-critical environments.

Research Assistant | UTRGV $\qquad$ Feb 2025 – Present

- Implemented Federated Averaging (FedAvg) algorithm to optimize model performance on edge devices while minimizing communication overhead.
- Evaluated clustering results using PID score and optimized cluster quality for Client Inclusion / Removal.

PROJECT EXPERIENCE

RAVEN - Rocket Avionics and Vehicle Node
Rocket Launchers | C, C++, Rust, TypeScript, and React

- Built RAVEN, a modular real-time avionics and telemetry platform in Rust and React, enabling sub-100ms data streaming from embedded systems (ESP32) to a live browser-based ground station.
- Designed a fault-tolerant serial-to-WebSocket bridge using tokio broadcast channels, with custom sync-word framing and zero-copy packet parsing for resilient communication in high-noise environments.
- Developed a dynamic telemetry dashboard in TypeScript/Vite with real-time metrics, map overlays, and remote command injection for hardware-in-the-loop testing of rockets and autonomous vehicles.

SENTINEL - System for Environmental Telemetry In-flight Electronics
Rocket Launchers | Tauri 2.0, Rust, C++, Jest, JavaScript, and **React** $\qquad$ *Dec 2024 – June 2025*

- Built a full-stack Avionics system enabling live tracking of rocket flight data with sub-second latency - Designed and implemented a full-stack solution using Rust with Tauri for serial communication and React with Vite for dynamic visualization including maps and 3D trajectory models

- Ensured Software Reliability by achieving 100% test coverage for critical data operations - Developed and maintained unit tests for backend parsing/streaming and frontend components, leveraging mockall, Jest, and React Testing Library to ensure robust integration across the stack.

- Implementing Sensor Fusion with Complementary Filters with GPS and IMU measurements for 3D orientation and Kalman Filter for reducing system noise for overall SNR improvement by 20% for data integrity

LEADERSHIP EXPERIENCE

The Rocket Launchers, Avionics Software Lead $\qquad$ *Sep 2024-Present*

- Leading a team of 4 students to design and integrate flight software with avionics computer hardware.
- Designing and developing a redundant avionics system for In Flight Electronics for a L3 Certified High-Powered Rocket.
- With mirrored subsystems to ensure reliability, gathering real-time data from sensors and transmitting it to a ground station for performance monitoring