Andrew Alvarez

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

EDUCATION

The University of Texas Rio Grande Valley (UTRGV)   **GPA: 3.54**
Bachelor of Science in Computer Science   Expected: Fall 26'

Relevant Courses: CS 1, CS 2, Mathematical Foundations of CS, Computer Org/Assembly, Digital Systems Engineering I, Software Engineering I, Technical Documentation, Computer Networks, Operating Systems, Data Structures and Algorithms, OOP in Java, UX/UI Design

TECHNICAL SKILS

- C, C++, Python, JavaScript/React, TypeScript, Rust, SQL, HTML, CSS, SPI, I2C, UART, Digital Multimeter, Linux, Unix, PowerShell, Git, GitHub, Gitlab , Grafana, Jira, Kubernetes, Unit Testing and Docker, React Bootstrap, React Query, Spring Boot, REST API's , gRPC, Agile

PROFESSIONAL EXPERIENCE

Software Engineer Intern | Dark Hive   *May 2025 – July 2025*

- Aided in designing front-end components and dashboards for drone data and flight logs within a DoD-compliant robotics platform under a continuous Authority to Operate (cATO) framework. Delivered changes to production to enable end users and the systems team to efficiently view data for individual or entire fleets, supporting streamlined analysis and decision-making in mission-critical environments.

Research Assistant | UTRGV Dept of Computer Science   *Feb 2025 – May 2025*

- Worked on implementing Federated Averaging (FedAvg) algorithms for federated learning, analyzing clustering results to identify consistently reliable or corrupted models and data. Designed zone-based evaluation around cluster centroids, using metrics such as PID scores to assess model/data integrity and resilience against external attacks.

PROJECT EXPERIENCE

RAVEN - Rocket Avionics and Vehicle Node   *July 2025- Present*
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**   *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 mock all, Jest, and React Testing Library to ensure robust integration across the stack.

- Implemented 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

The Rocket Launchers, Avionics Software Lead   *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