

# Joseph T. Johnson

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## Work Experience

### Chief Engineer – Modularity Inc.

Lafayette, Colorado (Mar 2021 – Mar 2025)

- Developed and maintained firmware in Rust, C, and C++ for an ARM Cortex-M3 with FreeRTOS, implementing core service sets for wireless devices and peripheral drivers for rapid hardware integration
- Generated hardware designs and software drivers for Ethernet, USB, UART, I2C, GPIO, ADC, and SPI interfaces, ensuring seamless interoperability with customer hardware and software ecosystems
- Created Rust, C, and C++ user SDKs for wireless devices designed to replace cabling in spacecraft, featuring a custom publish-subscribe architecture for reliable, low-latency data exchange
- Deployed a 100% Rust SaaS application with hardware interaction tools, CLI-based network command and control, and a reactive data visualization dashboard
- Maintained cloud deployed server functionality, including session-based authentication, Postgres database cluster management and persistent cross-platform configuration
- Implemented CI/CD pipelines using GitHub Actions for automated deployments across web, desktop and mobile
- Built a local network simulation tool for internal development using Python
- Established baseline processes for MBSE and digital engineering tool integrations within an agile systems engineering framework to enhance engineering efficiency and documented traceability
- Led development of management plans, lifecycle documentation, risk and requirement registers, and cost plans for multi-disciplinary aerospace projects, ensuring alignment with technical and business objectives
- Designed PCBs with Altium Designer for aerospace and terrestrial products, incorporating RF, power management and high-speed digital interfaces
- Executed 4 government contracts across NASA, AFWERX and SpaceWERX for over \$2M funding within 3 years

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## Skills

**Design Software:** Simulink, CATIA V5, SolidWorks, GMAT, KiCad, Altium  
**Other Software:** Capella MBSE, Jira, ClickUp, WSL, FreeRTOS, Git, Docker, Blender  
**Program Languages:** Rust, C, C++, SQL, MATLAB, Python, Bash, HTML  
**Certifications:** CATIA V5 Specialist - Part Design, Assembly Design, Generative Shape Design  
**Active Organizations:** Safety Critical Rust Consortium, AeroRust Foundation

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## Projects

### System Integration Lead – EagleSat-II 3UCubeSat

- Led a 20+ engineer team across 9 subsystems, overseeing integration of power, ADCS, UHF communications, payloads and more for a 3U CubeSat to be launched to LEO in 2025

### Senior Capstone Lead – Debris Recognition and Identification Platform

- Directed a 7-person capstone team in developing a machine vision-based space debris detection system with Python, culminating in an AIAA ASCEND 2022 publication
- Relevant Publication: Joseph T. Johnson, Rowan L. Molitor, Evelia Zapien Ramos, Tyler J. O'Donnell-Paccione, Megan R. Chavez, Madelynn M. Devaney, Trenton C. Bandy, Davide Conte and Richard Mangum. "[Space Debris Recognition and Identification Using Stereo-Optic Machine Vision](#)," AIAA 2022-4276. *ASCEND* 2022. October 2022.

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## Education

Embry-Riddle Aeronautical University

Prescott, AZ

**Bachelor of Science, Aerospace Engineering** - Area of Concentration: Astronautics

May 2022

Minors - Mathematics, Mechanical Propulsion