

ALEX FRALEY

Aerospace Engineer | Test, Integration & Validation

alexfraley.com • U.S. Citizen • Remote full-time available

SUMMARY

Systems engineer and validation specialist with 5+ years at NIST supporting UAS and robotics work across field, bench, and simulation-backed environments. Experienced in translating stakeholder needs into requirements-informed test scenarios, verification criteria, performance metrics, instrumentation plans, and technical documentation. Brings hands-on hardware/software integration experience and a practical bridge between simulation, system integration, and real-world field validation.

TECHNICAL STRENGTHS

Systems Engineering: requirements-informed test design, V&V, performance analysis, integration planning, technical documentation

Integration / Test: hardware-software integration, prototype bring-up, instrumentation, field and bench testing

Modeling / Simulation: Unreal Engine, JSBSim, scenario design, dataset capture, post-test analysis

Software / Tools: Python, ROS2, telemetry/video processing, CAD/SketchUp, cross-functional coordination

PROFESSIONAL EXPERIENCE

National Institute of Standards and Technology (NIST) | Robotics Research Engineer

Gaithersburg, MD | Dec 2023 - Sep 2025

- Led and supported repeatable UAS and robotic system evaluations for federal, public-safety, and research stakeholders, translating operational needs into structured test scenarios, verification criteria, and actionable engineering feedback.
- Contributed to standards-oriented test methods, performance metrics, and verification workflows for response robots, supporting operator proficiency, cross-system comparison, and disciplined system development.
- Planned and executed field and controlled-environment integration and test events, capturing synchronized video, telemetry, and scoring data for anomaly review and performance analysis.
- Supported hardware-software system integration and test readiness across instrumentation setups, drop-test hardware refinement, and practical test-fixture iteration to improve repeatability.
- Authored SOPs, JHAs, test plans, scoring packages, and after-action documentation to improve safety, consistency, traceability, and cross-team execution.

National Institute of Standards and Technology (NIST) | Pathways Student / PREP Researcher

Gaithersburg, MD | Jun 2020 - Dec 2023

- Supported standardized evaluation workflows for uncrewed systems through test setup, fabrication, data capture, scoring, and documentation across repeated field and lab events.
- Developed practical scoring aids and reproducible CAD / SketchUp build guides, including QR-code-based alignment metrics, to improve consistency, repeatability, and partner usability.
- Co-developed UAS test-method and scoring artifacts adopted into APSA Drone Train-the-Trainer curriculum for external and international delivery contexts.

SELECTED TECHNICAL PROJECTS

- Unreal Engine + JSBSim Drone Simulator - Developed a configurable drone simulation environment with adjustable aircraft parameters, imported environments, and evaluation-oriented workflows for test planning and prototyping.
- Computer Vision on Jetson - Prototyped YOLO/OCR pipelines to extract temperature and telemetry overlays from video for practical data extraction and post-test analysis.
- CERES Autonomous Drone - Built and programmed a Raspberry Pi / DroneKit-based UAV system supporting embedded flight software, mission logic, autonomy experimentation, and end-to-end integration.

EDUCATION & CREDENTIALS

University of Maryland Global Campus (UMGC) - M.S. Data Analytics, Oct 2025 - Present

University of Maryland, College Park - B.S. Aerospace Engineering (Space Track), 2023

Montgomery College - A.S. Aerospace Engineering (Honors), 2020

FAA Part 107 Remote Pilot • DGAC / AlphaTango Open Category A1/A3 completed • English fluent; French developing