**Alex Fraley**

📍 Washington, DC Metropolitan Area  
📧 [alexmfraley@gmail.com](mailto:alexmfraley@gmail.com) | 📞 +1 (240) 805-8214  
🔗 [LinkedIn](https://linkedin.com/in/alexmfraley) | 🐙 [GitHub](https://github.com/amfraley)

**Summary**

Robotics engineer specializing in **UAV testing, AI-driven perception, and autonomous systems**. Expert in robotic standards, AI/ML for robotics, flight testing, simulation modeling, and test method development. Proven track record in **federal, military, and emergency response robotics applications**.

**Professional Experience**

**National Institute of Standards and Technology (NIST)**

📅 *Dec 2023 – Present* | **Robotics Research Engineer**  
📅 *Sept 2022 – Dec 2023* | **Federal Intern, Pathways Program**  
📅 *June 2020 – Aug 2022* | **Associate, Professional Research Experience Program (PREP)**

* Developed **standard test methods** for aerial, ground, and aquatic robots.
* Led a **30+ agency collaboration** on bulk drone purchase agreements.
* Designed and validated **wildfire suppression UAV tests** for XPRIZE Wildfire.
* Built a **drone carrier release system** for UAV drop testing.
* Developed AI-enhanced UAV **thermal imaging analysis** (YOLO-OCR).
* Managed NIST’s UAV fleet, ensuring compliance with **RID & Blue/Green UAS** standards.
* Conducted **UAV flight testing** for LiDAR accuracy, thermal sensor validation, and obstacle avoidance.
* Created **3D CAD models** of UAV test environments and integrated them into simulators.

**Education**

🎓 **University of Maryland, College Park**  
**B.S. Aerospace Engineering** *(2023)*

* Team VULCAN – Drone Design Team (2021)
* NASA Artemis Astronaut VR Interface Project (2021)
* Terps Racing – Electronics Team (Formula EV)
* NASA Goddard Space Flight Center: Team O.U.T.L.I.E.R. (2023)

🎓 **Montgomery College**  
**A.S. Aerospace Engineering** *(2020)*

**Publications & Research**

📝 **Research Papers**

* [Adapting NIST Aerial Drone Tests for Thermal Identification, Inspection, and Suppression](https://www.nist.gov/publications/adapting-nist-aerial-drone-tests-thermal-identification-inspection-and-suppression)
* *Evaluating 3D Indoor Mapping Capabilities of UAS for First Responder Applications (upcoming)*
* *Outdoor sUAS Drop Tests: Assessing Dynamics, Velocity and Impact Forces of Falling Drones (upcoming, NIST IR)*

📰 **In the News**

* *Drones in Disaster Zones: How Advanced 3D Mapping Technology Can Help First Responders Save Lives*
* *Congress Meets Robots: CRA Co-hosts Senate Robotics Showcase and Demo Day*
* *ICRA 2023 & IROS 2024 Autonomous Quadruped Robot Challenges*
* *Texas Public Safety Robotics Summit*
* *UTAC & RoboCup Rescue Reports*

**Technical Skills**

🔹 **Flight Testing & Robotics**: UAV & sUAS Test Development, Sensor Calibration, Robot Dexterity & Performance Testing  
🔹 **Software & AI Development**: Python, C++, MATLAB, ROS 2, Unity, Machine Learning (YOLO, OpenCV, OCR)  
🔹 **Hardware & Embedded Systems**: NVIDIA Jetson Nano & Orin Nano, DJI Drones, Legged Robotics (Unitree GO2)  
🔹 **CAD & Engineering**: SolidWorks, Google SketchUp, 3D Printing & Rapid Prototyping  
🔹 **Collaboration & Documentation**: Technical Writing (SOPs, JHAs, Research Papers)

**Certifications & Awards**

✅ **FAA Part 107 Certified Drone Pilot**  
🏆 **Gilman Scholar** (U.S. Department of State, May 2022)  
🏅 **Dean’s List – A. James Clark School of Engineering** (Feb 2021)  
📜 **Robot Localization with Python and Particle Filters** *(Coursera, Sep 2024)*  
👨‍🏫 **Advanced sUAS Course Proctor**

**Additional Experience**

🚁 **Drone Pilot – DroneASAP** *(Freelance, 2020 – Present)* – Conducted aerial surveying, inspections, and real-time UAV data collection.  
🔋 **Electric Vehicle LV Team Member – Terps Racing** *(2023 – 2024)* – Designed & integrated low-voltage electrical systems for Formula EV race car.  
📏 **Land Surveyor – Snider and Associates** *(2019 – 2020)* – Performed geospatial mapping and surveying.