Esteban **Flores**

Mechanical Engineer · Robotics & Test Engineering · Autonomy & Prototyping

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Professional Profile

Mechanical engineer with experience in robotics hardware, autonomy, and test engineering. Designs, prototypes, and validates electromechanical systems through first-principles design, experimental testing, and data-driven iteration. Skilled in integrating sensing, control, and mechanical design for robust, field-ready hardware.

Experience

Robotics Intern — Ground Control Robotics

Atlanta, GA

Jan 2025 – Jul 2025

- Implemented closed-loop path following on multi-legged robotic platforms using Linux and Python.
- Developed a software suite for low-level control and telemetry (IMU, GPS, camera, servo systems).
- Programmed and characterized geometric-mechanics-based steering gaits for centipede robots, leading to submissions to SICB and ICRA conferences.
- Analyzed gait data and implemented pose definition algorithms using SVD-based methods for guidance, navigation, and control.
- Designed and compared IMU orientation estimation algorithms using Madgwick and Bayesian inference filters for computational efficiency.

Ground Systems Test Intern — Zipline International Inc.

San Francisco Bay Area, CA

Aug 2023 – Dec 2023

- Designed and instrumented system-level tests for drone docking mechanisms with loads exceeding 5000 N.
- Performed structural and loading analyses using Python, Siemens NX, and MATLAB.
- Developed a carrier-phase windup error model in Python and Rust for GNSS navigation systems.
- Built hardware and software for a custom data acquisition system synchronizing multi-rate sensor data between 200 Hz and 10 kHz.
- Processed and animated 3D motion capture data to correlate docking velocity and load behavior.

Mechanical Engineering Intern — Forterra

San Francisco Bay Area, CA

May 2023 – Aug 2023

- Designed a custom multi-sensor suite (lidar, radar, IR, thermal, and visual) for a Peterbilt 579 test vehicle.
- Modeled field-of-view studies to maximize coverage and prevent occlusion.
- Conducted FEA and hand calculations for stress and vibration analysis to meet MIL-STD-810 structural standards.
- Supported on-road testing and iterative sensor mount refinement.

Mechanical Lead — Georgia Tech Solar Racing

Atlanta, GA

2021 – 2024

- Led a 40+ member mechanical team in the design of a fully solar-powered vehicle for the American Solar Challenge and Formula Sun Grand Prix.
- Oversaw the design of frame, suspension, steering, and composite chassis using SolidWorks, ANSYS, and MATLAB.
- Conducted carbon fiber materials testing to characterize in-house composites for FEA validation.
- Authored a 29-page suspension design report for national safety and roadworthiness certification.

Education

Georgia Institute of Technology

Atlanta, GA

Bachelor of Science in Mechanical Engineering, GPA 3.95

2021 – 2024

- Dean's List, Provost Scholarship recipient.
- Focus: mechanical design, dynamics, manufacturing, test, and robotics.

Skills

Software & Tools Linux, Python, MATLAB, Siemens NX, ANSYS Mechanical, SolidWorks, C++, LabVIEW, Arduino, WINCAPS

Core Competencies	Robotics integration, Closed-loop control, Test automation, Mechanical design, Sensing and data acquisition, Finite element analysis
Languages	English (Native), Spanish (Advanced)