CESAR BRIONES

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EDUCATION

Bachelor of Science in Mechanical Engineering Expected May 2026
University of South Florida GPA: 3.79/4.0

LEADERSHIP

Aerostructures Lead, USF Rocketry Team (SOAR) August 2023 - Present

- Led a team of 20 in design and manufacture of internal and external structures for NASA Student Launch '24 & '25
- Replaced legacy design of steel threaded rod with CNC-machined aluminum bars, improving weight and integration
- Wrote MATLAB scripts to compare flight data with simulations, reducing analysis and documentation time by 40%
- Led the transition from traditional jig and hand tool manufacturing to CNC machining

EXPERIENCE

Research Lab Assistant, Corrosion Research Laboratory May 2024 – Present

- Designed a resin 3D printed cell for corrosion analysis, reducing the testing area by 95% for more localized analysis.
- Inspected aluminum anodization quality and compliance to customer specifications by performing electrochemical tests, analyzing layer thickness, corrosion resistance and surface roughness on randomly selected samples
- Developed a parametric COMSOL model to simulate voids in reinforcement tendons, validating impedance-based detection methods against real data for non-destructive structural assessment.

Research Lab Assistant, RANCS Research Group December 2023 – March 2024

- Designed and built an aluminum T-rail frame with structural brackets and pivots to elevate a $10,000 LIDAR sensor by 1 ft, resolving collision issues on the lab's autonomous vehicle
- Calculated the minimum height required to prevent LIDAR collisions with the car roof and validated the solution, which has performed successfully over 70 hours of on-road software testing

PROJECTS

Active Aerodynamic Control, USF Rocketry Team (SOAR) June 2024 – Present

- Designed a four-bar mechanism to increase the cross-sectional area of the rocket, allowing for a variable (C_d)
- Performed parametric CFD simulations using Ansys Fluent, calculating for the variance of the (C_d) over deployment
- Achieved a 26% mass reduction in CNC-machined aluminum parts by slotting non-critical areas, simulated with FEA
- Regressed a CFD drag data into a multivariate polynomial equation using MATLAB, reducing computational time for drag calculations and enabling more operations per unit of time in the airbrakes system's PID control

Engineering Lead, NASA L'SPACE MCA - Workforce Development Program May 2023 – August 2023

- Coordinated with 4 subsystems of 15 team members on the preliminary high-level design of an exploration rover
- Designed critical payload and structural components of an exploration rover in Siemens NX for a dwarf planet environment with a size and mass constraint of 1.25m X 1.25m X1.25m and 125 kg, respectively
- Led the writing of 4 technical reports adding up to 330 total pages, and explained the high-level preliminary design of the project as part of a 30-minute presentation

SKILLS

Programing Languages: MATLAB, Python, C#
Software Proficiency: SolidWorks, Ansys Fluent and Mechanical, NX12, COMSOL Multiphysics, Fusion 360, Arduino
Certifications: SOLIDWORKS Associate - Mechanical Design (CSWA) & Additive Manufacturing
Fabrication: CNC Machining Programming and Operation, Soldering, 3D Printing, Power Tools, composites handling