CESAR BRIONES

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EDUCATION

Bachelor of Science in Mechanical Engineering Expected May 2026
University of South Florida GPA: 3.88/4.0

LEADERSHIP

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

- Led 12 team members in the design of a 47 lb, with an 18 lb. payload, 11-ft rocket, capable of achieve an altitude of 5000 ft and deploying a drone during descent without compromising structural integrity
- Performed SolidWorks FEA and hand calculations on the structural components for expected loads during ascent, parachute deployment, and recovery, calculating for a worst-case scenario of 6397 N, with a factor of safety of 1.7
- Simulated and validated flight profile based on mass, wind conditions, and rocket aerodynamics, to predict an estimated altitude of 3400 ft, resulting in a 32ft and 0.94% relative altitude error on launch vehicle prototype
- Directed the organization and writing of 4 technical reports, adding a total of 550 pages, detailing the vehicle project

EXPERIENCE

Research Lab Assistant, Corrosion Research Laboratory May 2024 – Present

- Designed, and implemented an electrochemical cell solution to analyze corrosion activity in steel reinforcements over an area of 2.25 mm^2, allowing for pitting corrosion analysis, which was not possible with previous testing setup
- Developed a model in COMSOL FEA to predict mechanical tensile failure of steel reinforcements affected by cross-sectional area reduction due to corrosion products and simulate necking in the center of the specimen
- Constructed a leadscrew-based fixture mechanism to facilitate testing with the electrochemical cell, allowing for testing over irregular and cylindrical surfaces

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

- Proposed, designed, and constructed a frame using Aluminum T-rail extrusions, structural brackets and framing pivots to support a $10,000 LIDAR sensor on top of the lab autonomous vehicle, fixing the LIDAR collision issue
- Calculated the minimum height required to avoid LIDAR light collisions with the roof of the car, and validated it through on-road testing, adding up to a total of 70 testing hours

PROJECTS

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

Payload Team Member, USF Rocketry Team (SOAR) September 2022 – April 2023

- Contributed to prototyping of a rack and pinion system to extrude camera out of the rocket airframe by 5 cm
- Designed and soldered 2 prototype PCBs, reducing electronics volume by 30% and increasing components modularity
- Created a testing environment simulating post landing configuration, effectively validating payload's camera extrusion
- Fabricated jigs to improve CNC machining setup efficiency and reduce fiberglass and aluminum stock leftover

SKILLS

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