CESAR BRIONES

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EDUCATION

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

SKILLS

Certifications: SOLIDWORKS Associate - Mechanical Design (CSWA) & Additive Manufacturing
Software Proficiency: SolidWorks, FEM, MATLAB, NX 12, COMSOL, Python, Simulink, Fusion 360, JMARS, Cura, Arduino, OpenRocket, Carbide Motion, RockSim, Photoshop, Anycubic

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 4500 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 flight profiles based on mass, wind conditions, and rocket aerodynamics, to predict an estimated altitude of 3400 ft, resulting in a 32ft and 0.94% altitude error on launch vehicle
- Directed the organization and writing of 3 technical reports, adding a total of 550 pages, detailing the vehicle project.

RELEVANT EXPERIENCE

Research Lab Assistant, Corrosion Research Laboratory May 2024 – Present

- Developed an electrochemical micro testing cell to analyze corrosion activity in steel reinforcements.
- Predicted failure using COMSOL FEA tools, taking into consideration loss in cross-sectional area due to corrosion.
- Designed a lead-screw fixture assembly to apply clamping pressure between the testing cell and working sample, removing electrolyte leaking.

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

- Proposed, designed, and manufactured 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.
- Calculated the minimum heigh required to avoid LIDAR light collisions with roof of the car, and validated it through a SolidWorks Assembly and on-road testing.

PROJECTS

Sentry Turret, Personal Project January 2024 - Present

- Designed a mechanical system driven by two servos, gears, rack and pinions to give functional mobility to the model
- Designed the system with a focus on 3D-printing manufacturing to optimize material usage and production time.
- Used SolidWorks to prototype the design inspired by the Portal franchise, making it 40 cm tall.

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

- Aided in the prototyping of the rack and pinion system to extrude a camera out of the rocket airframe by 5 cm
- Designed and soldered 2 prototype PCBs, reducing the payload volume by 20% and increasing part compatibility
- Applied tight tolerancing to parts of the rack and pinion system, and employed additive manufacturing to print parts
- Manufactured 5 bulk-plates using CNC machining, through the use of Fusion 360 Manufacture feature

HONORS AND AWARDS

USF Space Apps Tampa Winner October 2023
USF Innovation Fest CAD Winner February 2023