

SKYLER CAO

www.linkedin.com/in/skyler-cao — skylercao@gmail.com
U.S. Citizen

EDUCATION

University of California, Irvine
Bachelor of Science (B.S.) in Aerospace Engineering
GPA: 3.4/4.0

Irvine, California
June 2028

EXPERIENCE

MAS Rocketry
Club President

Irvine, California
Sept 2025 – Present

- Engineered an optimized rocket nozzle using SolidWorks CAD and Ansys Fluent, applying Computational Fluid Dynamics (CFD) and structural Finite Element Analysis (FEA) over 6 mesh-refined iterations to improve predicted thrust coefficient by 4% versus baseline and validate aerodynamic performance under simulated flight conditions
- Led full-cycle design of a custom solid propellant propulsion system, overseeing motor selection, thermodynamic performance analysis, stress analysis of motor casing (minimum safety factor of 1.8 at 800 psi chamber pressure), and structural integration with the rocket airframe
- Developed a custom avionics PCB using an ESP32 in Altium Designer to capture and transmit real-time flight telemetry data
- Modeled multiple propellant grain geometries in MATLAB to simulate and optimize thrust-time curves, improving predicted burn efficiency by 8% across 4+ configurations

NASA Community College Aerospace Scholars
Hardware Specialist

Remote
Aug 2024 – Oct 2024

- Designed a lunar drilling and ice-sampling rover in Siemens NX, applying GD&T principles and CAD to meet mission payload and structural requirements
- Conducted systems engineering analysis of the Moon's thermal environment (-330°C to 54°C) and surface topography, adapting rover aeroshell and mobility systems for extreme temperature ranges and optimized traverse routing
- Engineered a custom 12-wheeled rover with 6 degrees of freedom, capable of climbing 30° inclines

PROJECTS

Drag Build-Up & Flight Performance Analysis of a Jet Aircraft

- Built a MATLAB drag model for a 98,000 lb twin-engine jet, using component build-up (wing, fuselage, tails, pylons, nacelles) with digitized and curve-fit skin friction, form factor, and Oswald efficiency data, measuring wing wetted area directly from Solidworks model with Boeing 737 airfoils, and validated against a reference case over a 200-900 ft/s airspeed sweep
- Quantified parasitic, induced, and total drag across 5 flight phases (takeoff, climb, cruise, descent, and landing), identifying a Lift/Drag max of 17.9 at 610 ft/s to determine the optimal cruise speed for maximum endurance on a reconnaissance mission

Interplanetary Trajectory Design & Mission Analysis

- Modeled and visualized optimal 3D transfer trajectories, capturing a local minimum Delta V of 8.5 km/s (710-day transfer), mapping the exact spatial coordinates of Earth at departure and Didymos at arrival, with the use of MATLAB
- Conducted a preliminary mission analysis to the Near-Earth Object 65803 Didymos, utilizing Lambert's problem solutions to optimize interplanetary transfer trajectories across a 1,000-day launch window porkchop plot (16,000 transfer cases)

SolidWorks CAD Modeling & Aerodynamic Flow Simulation of a Turbofan Assembly

- Modeled and analyzed a high-bypass engine assembly in SolidWorks to evaluate the geometric constraints of varying bypass ratios from 5:1 to 10:1 with simulated pressure drops across 12% on overall propulsion efficiency
- Conducted internal Computational Fluid Flow Simulations with Ansys Fluent to analyze airflow behavior, pressure drops, and velocity profiles

SKILLS

Technical SolidWorks, Siemens NX, MATLAB, MATLAB Simulink, Ansys Fluent, Altium Designer, Computational Fluid Dynamics (CFD), Finite Element Analysis (FEA), Orbital Mechanics, Aerodynamics, Thermodynamics, Structural Analysis, Avionics, GD&T, PCB Design, Propulsion System Design, Trajectory Analysis, Finite Stress Analysis, Data Acquisition, Controls System, C++, Java