

Matthew V. Lewton

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Education

Purdue University | West Lafayette, IN

Expected Graduation: December 2025

Bachelor of Science in Mechanical Engineering

GPA: 3.96/4.00

Work Experience

SpaceX - Brownsville, TX

January 2024–August 2024

Super Heavy Booster Structures Engineering Intern

- Owned design and integration of I beam and cylindrical struts on aft end truss, serving as center and middle engine thrust load path to transfer tube and barrel, from initial sizing to design review and final release.
- Identified need for landing tank attachment redesign and proposed solution accepted by prop team to improve load path to aft thrust structure. Reduced reaction loads estimated to save hundreds of kilograms in thrust structure.
- Analyzed strut and weld joint strength and stability in vehicle level Abaqus FEM model and determined driving load combination for each component/joint to streamline analysis via data reduction of section force outputs.
- Created weld testing campaign for all weld/parent configurations on aft truss to characterize Von Mises and line load allowables with novel filler and parent materials. Optimized for minimum unique geometries to bound all truss welds.
- Tested strut with novel weld procedure successfully validating plastic buckling calc and FEM predictions, characterized end conditions for analysis, and determined acceptable eccentricity and warping for production.

Bechtel Innovation and Design Center - West Lafayette, IN

April 2022–Present

Manufacturing Peer Mentor

- Conduct CAM consultations for CNC mills and lathes to advise students on their manufacturing plan, tooling and work holding, and approve CAM for safe operation on machines.
- Teach students to set up and operate Haas 3 & 5 axis CNC mills, CNC lathe, and waterjet.

Composites Manufacturing & Simulation Center - West Lafayette IN

May 2023–August 2023

Undergraduate Research Assistant

- Designed and machined forced convection nozzle with internal N2 channels to heat carbon fiber/polymer filament.
- Modeled filament exit temperature in Matlab as a function of forced convection parameters and filament feed rate. Conducted experiments to show model was accurate within 5% of predicted exit temperature.
- Analyzed pultrusion chamber's response to heater PID control by using Abaqus thermal FEA.

Technical Projects

Purdue Space Program Liquid Rockets Team

August 2021–November 2023

Vehicle Structures Lead

- Led team of 35 students in conceptualization, design, and manufacture of primary structures for an 850 lbf Ethanol-LOX rocket launching to 40,000 ft.
- Developed a program to calculate vehicle's bending load profile due to aerodynamic and inertial loads statically through various regimes of flight, and dynamically through the parachute deployment event.
- Designed strut/panel style airframe driven by thrust/inertial bending loads, fin attachment/alignment features, and packaging plumbing and avionics. Analyzed strength and stability margins in Ansys Mechanical.
- Led exploration of composite manufacturing techniques and destructive testing campaign for a structural carbon fiber airframe, managing 15+ team members during layups and laminate post processing.
- Sized carbon fiber airframe laminate for multidirectional loading, and optimized strength/stability in Ansys ACP.