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 60+ I-beam and cylindrical struts on aft thrust structure truss, serving as primary inner structure for engine thrust load, from initial sizing, to multiple design reviews, to final release for production.
- Identified need for landing tank attachment redesign and proposed solution accepted by propulsion team to improve load path to aft thrust structure. Reduced reaction loads estimated to save hundreds of kilograms in thrust structure.
- Collaborated with build team to ensure struts were practical for manufacturing and integration at scale, including compatibility with global tolerance stack-up, realistic welder access, and feasible installation and locating procedure.
- Created weld testing campaign for 100+ unique welds on aft truss to determine Von Mises and line load allowables with new filler and parent materials. Optimized coupon geometry to bound testing of all possible truss welds.
- Conducted full scale structural test of strut using unique automated weld procedure, validating FEM for joint stiffness. Iterated quickly on high volume production process and determined allowables for eccentricity and warping.

Bechtel Innovation and Design Center - West Lafayette, IN   April 2022–September 2025
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 at various regimes of flight, and dynamically through the parachute deployment event.
- Designed strut/panel airframe driven by thrust and inertial bending loads, fin attachment/alignment features, and packaging for fluids and avionics. Iterated design for strength and stability margins in Ansys.
- Led exploration of composite manufacturing techniques and destructive testing campaign for a structural carbon fiber airframe, managing 15+ team members during layups, laminate post processing, and structural testing.
- Designed carbon fiber airframe laminate for multidirectional loading, and optimized strength/stability in Ansys ACP.