

Matthew V. Lewton

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Education

Purdue University | West Lafayette, IN

Bachelor of Science in Mechanical Engineering, Mathematics Minor.

Expected Graduation: December 2025

GPA: 3.98/4.00

Experience

Purdue Space Program Liquid Rockets Team

Vehicle Structures Lead

West Lafayette, IN August 2021–Present

- Presently leading team of 35 students in conceptualization, design, and manufacture of primary structures for a 2400 lbf Ethanol-LOX rocket launching to 65,000 ft.
- Developed a program to calculate vehicle's bending load profile due to aerodynamic and inertial loads.
- Drove system and component design of lower airframe's strut structure, fin attachment/alignment, and plumbing access.
- Optimized airframe struts for mass considering failure in bending, lateral buckling, and torsional buckling.
- 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.
- Determined carbon fiber airframe's expected failure mode and optimized laminate using Ansys.
- Advised structures, fluids, and propulsion teams on part manufacturability and developed manufacturing plan and CAM for bulkheads, struts, fins etc.

Composites Manufacturing & Simulation Center

Undergraduate Research Assistant

West Lafayette, IN May 2023–August 2023

- Designed and manufactured nozzle to convectively heat continuous carbon fiber additive manufacturing.
- Modeled convective heat transfer conditions in Matlab to determine nozzle geometry for high filament feed rates.
- Optimized pultrusion system's polymer chamber for optimal roller contact pressure, and even heat distribution.
- Analyzed temperature distribution of pultrusion chamber using Abaqus thermal to simulate heater PID control.
- Machined stainless steel pultrusion chamber and convective nozzle assemblies to tight tolerance fits.

Bechtel Innovation and Design Center

Manufacturing Peer Mentor

West Lafayette, IN April 2022–Present

- Conduct CAD/CAM consultations with students seeking to design and manufacture parts for projects in research, automotive racing, rocketry etc.
- Advise students on part manufacturability, tooling and work holding for their machining operations.
- Teach students to set up and operate Haas 3 & 5 axis CNC mills, live tooling lathe, and waterjet.

Personal Projects

High Power Rocket and Composites

- Designed and built high power rocket for Level 1 NAR certification.
- Manufactured fiberglass airframe and fins with a wet layup and interior molding method.
- Destructively tested compressive strength of overlapped seam to verify composite FEA simulations.

Desktop CNC Mill Design

- Designed desktop 3 axis CNC mill to machine small aluminum parts at the size and cost of a 3d printer.
- Optimized structural frame and linear motion systems for mechanical rigidity.
- Synthesized electrical system with Arduino controlled stepper driven axis, VFD spindle control, and limit switch probing.

Portfolio Website: mattlewton.me

- Created custom HTML templates for Jekyll to generate articles, images, links etc.
- Article content written in Markdown with custom image box templates to simplify site maintenance.
- Styled in CSS without libraries.

Technical Skills

Software: Siemens NX, Ansys, Abaqus, Solidworks, Fusion 360, Excel

Programming Languages: Python, MATLAB, C, HTML/CSS