Matthew V. Lewton

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Education

Purdue University | West Lafayette, IN **Expected Graduation: December 2025**
Bachelor of Science in Mechanical Engineering, Mathematics Minor. **GPA: 3.98**

Experience

Purdue Space Program Liquid Rockets Team **West Lafayette, IN August 2021–Present**
Vehicle Structures Lead

- Presently leading team of 35 students in conceptualization, design, and manufacturing of primary structures for a 2400 lbf Ethanol-LOX rocket launching to 65,000 ft.
- Led exploration of composite manufacturing techniques for a structural honeycomb carbon fiber airframe and composite modeling for simulations. Managed 15+ team members during layups and manufacturing.
- Drove system and component design of lower airframe's, fin structure, fin attachment/alignment, and plumbing access.
- Developed a program to determine loading on structural components due to thrust and wind induced aerodynamic loads.

Bechtel Innovation and Design Center **West Lafayette, IN April 2022–Present**
Manufacturing Peer Mentor

- 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.

Composites Manufacturing & Simulation Center **West Lafayette, IN May 2023–August 2023**
Undergraduate Research Assistant

- Designed and manufactured convectively heated nozzle for continuous carbon fiber additive manufacturing.
- Modeled convective heat transfer conditions in Matlab to size nozzle geometry for high filament feed rates.
- Optimized carbon fiber pultrusion system's polymer chamber for optimal roller contact pressure, and efficient heating.
- Analyzed polymer temperature distribution pultrusion chamber using Abaqus thermal to simulate heater PID control.
- Machined stainless steel pultrusion chamber and nozzle assembly with tight tolerence fits using 5 axis toolpaths.

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 Jeckyll 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