

Campbell Downs

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Education

Purdue University

Expected May 2029

Bachelor of Science in Aerospace Engineering; Minor in Product Lifecycle Management

West Lafayette, IN

- **GPA: 3.31** | U.S. Citizen

Relevant Coursework

- Aerospace Design
- Aeromechanics I
- Thermodynamics I
- Digital Manufacturing
- Simulation & Visualization
- Linear Algebra
- Differential Equations
- C Programming

Experience & Engineering Involvement

Handshake AI

May 2026 – Present

AI Fellow (Independent Contractor)

Remote

- Completed **350+** **contracted hours** evaluating AI model outputs and annotating 2-30 minute videos for multimodal action-recognition and tracking tasks.
- Maintained approximately **4/5** on recurring quality assessments, advanced twice to higher work-access and compensation tiers, and was selected to review and correct peer submissions.

Purdue Orbital

September 2026 – Present

Launch Structures Team Member

West Lafayette, IN

- Member of the Launch Structures team supporting structural design, manufacturing, and systems integration for high-altitude launch hardware.

Nashville Adventure Science Center

2025 – 2026

STEM Education Volunteer

Nashville, TN

- Contributed **40+** **volunteer hours** supporting STEM education, science outreach, and visitor engagement.

Selected Engineering Projects | Portfolio

Project ECHO – Endurance-Optimized Multirotor | *Python, MATLAB, CAD, Systems Optimization* 2026 – Present

- Developing a lower-cost aerial imaging platform that balances **system cost, flight endurance, and usable image quality** for small-scale agricultural and research applications.
- Building a data-driven workflow to evaluate real motors, propellers, ESCs, batteries, and imaging hardware through propulsion modeling, component trade studies, and system-level optimization.

Multi-Station Fitness Rack | *SolidWorks, Structural FEA, Fatigue Analysis*

2026

- Designed an A36 steel fitness rack for a **250 lb user load**, defining factor-of-safety and fatigue requirements across four load cases.
- Conducted linear static FEA and fatigue validation, then reinforced critical members based on simulation results until structural requirements were met.

Bicycle Horn Mount Optimization | *SolidWorks, Parametric & Topology Optimization*

2026

- Rebuilt a Nylon 6/10 CAD model, defined five design variables, and evaluated **270 parametric configurations** for mass, stiffness, and factor of safety.
- Applied parametric and topology optimization to reduce part mass by approximately **30%** while maintaining factor of safety above 100.

Technical Skills

CAD / PLM : Siemens NX, SolidWorks, Teamcenter (PDM), parametric modeling, assemblies, engineering change orders (ECOs)

Analysis : SolidWorks Simulation, linear static FEA, fatigue analysis, transient thermal simulation, parametric studies, topology/design optimization

Programming / Data : C, Python, C#, MATLAB, JavaScript, HTML, Microsoft Excel

Manufacturing / Methods : Additive manufacturing, 3D printing, introductory CNC/digital manufacturing, requirements definition, trade studies, technical documentation