Beau Bernards

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Education

University of Wisconsin - Madison Madison, WI
B.S. Mechanical Engineering Dec 2025

Experience

UW - Madison Madison, WI
Engineering Research Intern May 2025 – Dec 2025

- Designed and developed new mechanical components and lattice-based structures using SolidWorks and nTopology, supporting product process innovation initiatives.
- Built detailed 3D models and assemblies and generated 2D drawings to support fabrication via SLS additive manufacturing.
- Conducted finite element analysis (ANSYS) to evaluate structural performance and support data-driven design decisions.
- Performed dimensional inspection and quality verification using 3D scanning and point cloud analysis

JP Cullen Madison, WI
Project Engineer Intern May 2023 – August 2023

- Reviewed and interpreted construction drawings, specifications, and technical documentation to support accurate execution and quality assurance
- Assisted in planning and coordination of a $200M infrastructure project, supporting schedule tracking and engineering deliverables
- Processed procurement orders totaling over $1,000,000 managing vendor communication and delivery tracking.
- Monitored budgets and project costs, identifying variances and supporting cost-control efforts.

Engineering Projects & Involvement

Advanced Robotics Project Madison, WI
Autonomous Quadrotor Drone (Modeling, Controls, Motion Planning, Estimation) Sep 2025 – Dec 2025

- Designed a complete mechanical CAD model in SolidWorks, including assemblies and component layouts.
- Modeled system dynamics in MATLAB, incorporating rigid-body motion, thrust, and torque effects.
- Developed and implemented control/motion-planning algorithms, supporting reliable and repeatable behavior
- Generated technical documentation and design artifacts to communicate system architecture and performance.

Automated Acoustic Levitation Injection System Madison, WI
Pharmaceutical-Oriented Automation & Precision Handling Sep 2024 – Dec 2025

- Designed and developed a precision 3-axis automated motion system intended for non-contact droplet handling applications in pharmaceutical and clean-process environments
- Created detailed SolidWorks 3D models and 2D fabrication drawings to support controlled assembly, repeatability, and future process validation
- Considered cleanability, non-contact handling, and contamination risk reduction in system design to align with cGMP principles used in pharmaceutical manufacturing
- Conducted system testing and verification, achieving ±0.02 mm positional accuracy of injection location

WiscWind (DOE Collegiate Wind Competition) Madison, WI
Project Development/Mechanical Member Jan 2025 – Dec 2025

- Designed and supported the manufacturing of a small-scale wind turbine, contributing to component design, assembly planning, and hands-on build activities
- Placed 1st in the nation for the 2024 Collegiate Wind Competition Project Development
- Collaborated on the design of a large-scale offshore wind energy system, emphasizing mechanical systems and foundations
- Researched alternative design solutions and evaluated feasibility based on environmental and operational constraints
- Contributed to technical documentation and final design reports supporting successful competition qualification

Skills

Software: SolidWorks, Ansys, AutoCAD, Microsoft Office, BlueBeam
Programming: Python, MATLAB, Arduino IDE (C++)
Manufacturing: 3D Printing (FDM, SLS, SLA), CNC Machining, Quality Inspection