Matthew Bulger

+1(860)-534-1107 mb2564@cornell.edu

My Mission: Focused on sustainable mechanical engineering solutions and data-driven innovation for mechanical systems and structural projects, and interested in Future Leadership and Management Programs.

EDUCATION

Mechanical Engineering B.S, *Cornell University, College of Engineering, Ithaca, NY* **May 2026**
Relevant Courses: Mechatronics, System Dynamics, Propulsion of Aircraft and Rockets, Structural Dynamics and Vibrations, Design for Manufacturing, Fluid Mechanics, Automotive Engineering

PROFESSIONAL EXPERIENCE

Porous Material Inc. *Product Development and Research Engineer, 10hr/wk, October 2025 - Present*
- Developed and modeled **fluid-mechanical systems** using **SolidWorks** for porosity testing machines.
- Validated flow direction and performed **quality control** inspections of completed machines.

AE2S, *Mechanical Engineering Internship, May 2025 - August 2025*
- Reviewed and approved engineering plans and submittals for pipeline infrastructure and water filtration systems using **Civil 3D** and **Bluebeam**, ensuring compliance with ASTM specifications and standards.
- Acted as **Resident Project Representative** on pipeline construction projects, conducting onsite inspections, identifying and resolving issues, and ensuring adherence to quality and safety requirements.
- Performed **fluid system testing and analysis** by measuring and verifying water treatment plant flow rates, ensuring accuracy of hydraulic performance and water quality against design specifications
- Facilitated direct **communication** between contractors, clients, and key stakeholders, streamlining decision-making and maintaining project timelines.

Information Decision Science Laboratory, *Mechanical Team Member, May 2024 - Oct 2024*
- **Designed and built testing implementations** for autonomous vehicle decision-making software.
- Engineered **autonomous convoy systems** supported by a drone fleet concept capable of surveilling terrain, detecting threats, and providing early hazard warnings for vehicles in motion.
- Designed/assembled printed circuit boards to interface with **Arduino Nano** for model vehicle control.
- Developed and executed **test procedures** to validate autonomous vehicle-drone coordination models, ensuring system reliability through data-driven performance evaluation.

Seismic Design Project Team Lead, *Dynamics***,** *Cornell University,* Oct 2022-Present
- **Led a 30+ member multidisciplinary team** in designing, fabricating, and testing scale-model seismic structures for the Earthquake Engineering Research Institute International Competition; presented designs and defended decisions before a panel of industry engineers and researchers.
- Directed construction operations, trained team members, oversaw **quality control**, and implemented design modifications under tight deadlines without compromising structural performance.
- Applied **MATLAB** and structural dynamics principles to analyze raw ground motion files, predict structural responses, and perform **vibrational analysis** to prevent structural failure
- Designed friction, viscofluid, and tension-based **damping systems** to reduce modal displacement
- Raised $10,000 through sponsorships and fundraising, managed a $30,000 operating budget.

SPECIALIZED SKILLS

Technical: AutoCAD, SolidWorks, Fusion 360, PCB Design, MIG welding, Metal Fabrication, Laser Cutting, Soldering, ANSYS, BIM 360, Matlab, Python, Excel, Fusion360, SAP2000, C++, Mandarin(Chinese)