EMMA BOURGEOIS

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EDUCATION

Cornell University, College of Engineering, Ithaca, NY **Expected May 2025**
Bachelor of Science, Mechanical Engineering
Relevant Courses: Fluid Mechanics, System Dynamics, Differential Equations, Aeronautics, Thermodynamics, Material Science, Heat Transfer, Circuits, Digital Manufacturing, Mechanical Synthesis, Advanced Product Design Optimization

ENGINEERING EXPERIENCE

Binsky Snyder, Princeton, NJ, *Mechanical Engineering Intern* **June 2024 – August 2024**
- Maintained construction schedules and production coordination for the engineering team for the Princeton University School of Engineering and Applied Science (SEAS) project, a 300,000 square foot building expected to be completed by Fall 2025.
- Collaborated with project engineers to ensure on-time production line deliveries, increasing throughput and reducing bottlenecks, downtime, and material shortages, ultimately improving overall front-end manufacturing efficiency by 15%.
- Reduced build time by 30% by utilizing SPS and Stratus softwares to enhance lean manufacturing processes, streamline workflow, and iterate construction plans with refined Bill of Materials (BOM) to ensure precise documentation of materials.
- Presented data driven findings to senior leadership, highlighting process inefficiencies and recommending optimizations that enhanced operational efficiency, reduced costs, and informed strategic decision-making for future HVAC projects.

PROJECT EXPERIENCE

NASA ChipSat Design Optimization, Multidisciplinary System Design, *Cornell University* **January 2025 – Present**
- Contributing to the NASA Lunar-Impact ChipSat team by focusing on the survivability, structural strength, electronic arrangement, material, and cost-efficiency for the lunar impact missions by implementing multidiscipline analyses.
- Performing detailed analyses of the ChipSat flight profile by leveraging LS-DYNA simulations and Monte Carlo analysis to enhance lunar impact survivability to at least 5% post-impact, while upholding NASA's 3U CubeSat constraints.

Early-Stage Venture Development, Entrepreneurship for Engineers, *Cornell University* **January 2025 – Present**
- Co-found and lead hardware development for a direct-to-consumer solution that automates heating control on radiators for 2.1 million New York City residents, providing an updated centralized system that integrates thermostat and mobile app control.
- Conducting market research to identify key opportunities for consumer adoption, cost reduction, and energy efficiency.
- Spearhead prototype development while collaborating on business strategy, focusing on market positioning, pricing strategies, customer segmentation, and go-to-market plans in preparation for the alpha model device commercialization.

Weather Apparel Product Development, Senior Design Project**,** *Cornell University* **August 2024 – December 2024**
- Created an innovative hood insert with a cross-functional team to enhance jacket stability, support, and weather protection by utilizing CAD modeling to incorporate feedback from 100+ user tests**,** refining material selection for multiple prototypes.
- Presented findings to over 50 industry advisors, incorporating feedback to drive final iterations, explored partnerships with apparel companies for commercialization, and filed design and utility patents to protect the product design and function.

Performance-Driven Design: Ski Boot Sole Guard, Innovative Product Design, *Cornell University* **January 2024 – May 2024**
- Conceptualized and prototyped a hands-free, compact ski boot sole protector in Fusion 360 aimed at reducing wear and extending the lifespan of ski boots by 50%, reducing industry product waste and increasing useability, traction, and safety.
- Performed FEA analysis to assess material elasticity and identified design defects to determine the best design for durability and performance, ensuring the protector met functional, structural, and environmental requirements within size constraints.

ADDITIONAL EXPERIENCE

Taverna Banfi, Ithaca, NY, *Assistant Supervisor, Host/Server* **June 2023 – Present**
Cornell Anglers' Society, Cornell University, Ithaca, NY, *President* **May 2024 – Present**
Cornell Maker Club, Cornell University, Ithaca, NY, *Member* **August 2021 – Present**
Wachusett Mountain, Princeton, MA, *Ski Instructor (5th Year)* **November 2020 – Present**

SKILLS

- Coding Languages: Arduino; MATLAB; Introductory C++ Programming; Python; Raspberry Pi, Simulink; Matplotlib
- Modeling & Design: SolidWorks; AutoCAD; Autodesk Fusion360; OnShape; Finite Element Analysis (FEA) & Simulation
- Prototyping: Hand Drafting; Soldering; Additive Manufacturing; Product Testing; 3D Printing; Project Management