Maddox Nesterczuk

mwn43@cornell.edu | linkedin.com/in/maddox-nesterczuk | U.S. Citizen | Willing to Relocate

Education

Cornell University – B.S. Mechanical Engineering
Concentration: Aerospace Engineering | Minor: Philosophy | GPA: 3.89 | Expected May 2027
Study Abroad (HKUST, Summer 2025): Generative AI & Psychology

Engineering Experience

Advanced Space Technology Research and Architectures (ASTRA) Lab Aug 2025 – Present
Student Researcher | Ithaca, NY

- Built a Python-based multi-parameter model to predict neutral particle density in electrospray thruster plumes, supporting improvements in thruster performance and operational lifetime.
- Analyzed simulation datasets in Python to characterize spatial variation in neutral particle density.
- Generated plume visualizations in ParaView to assess simulation characteristics and select simulation parameters.

Cornell University Autonomous Drone Project Team Oct 2023 – Present
Mechanical Lead | Ithaca, NY

- Lead the mechanical subteam by developing project concepts, defining schedules, and mentoring new members.
- Ran CFD simulations in ANSYS Fluent to visualize airflow around an EDF-propelled drone and its wings, using post-processing to calculate lift and drag.
- Collaborated with mechanical, electrical, and computer science teams to prototype a large carrier drone; designed and manufactured a carbon-fiber battery mount and mounting plate in Onshape and Fusion 360.
- Operated a CNC machine to fabricate carbon-fiber and aluminum components for multiple drone prototypes.

Projects

Load Cell Design

- Performed finite element analysis in ANSYS Mechanical to evaluate the performance of a load cell and optimize its deflection and safety factors. Designed a bridge circuit for the cell to measure strain.

Shoe Cleaner

- Created and iterated CAD models in Fusion 360 for an automated shoe-cleaning device. Manufactured components with 3D printing and laser cutting; assembled the shoe cleaner with basic hand tools. Presented a final rendering package, slideshow, and report to faculty reviewers.

Dynamical Simulations

- Simulated dynamical systems using MATLAB's symbolic toolbox and numerical integrators, including N-body gravitational interactions and multi-link pendulums.

Work Experience

Long Island Lutheran Middle & High School Summer Camp July 2024 – Aug 2024
Counselor: Robotics, Engineering, and Video Game Design | Brookville, NY

- Guided campers through building and programming LEGO robots for structured games and engineering challenges.
- Worked with the program lead to teach campers block-based coding and simple video game design concepts.

Skills

CAD & Simulation: ANSYS Fluent, ANSYS Mechanical, Autodesk Fusion 360, Creo, Onshape, Simulink, ParaView
Programming: Python, MATLAB, Java
Manufacturing & Prototyping: CNC machining, manual machining, 3D printing, laser cutting
Other: Microsoft Office, technical writing
Competitive Épée Fencer: Cornell Men's Club Fencing and nationally A-rated