Ashley Miller

(973)-369-8444 | am6555@columbia.edu | linkedin.com/in/ashleymiller20 | millerashley.github.io/portfolio

EDUCATION

Columbia University New York, NY
MS in Biomedical Engineering, GPA: 4.0/4.0 *Expected Jan 2026*
Cornell University Ithaca, NY
BS in Engineering Physics, GPA: 3.5/4.0 *Aug 2020—May 2024*

TECHNICAL SKILLS:

- **Design & Fabrication:** Autodesk Inventor Professional, AutoCAD, Fusion 360, Solidworks, Engineering Drawings, Design for Manufacturability, 3D Printing, Manual Mill, Manual Lathe, Tooling, Laser Cutting, Soldering, Embedded Systems
- **Simulation & 3D Finite Element Modeling:** Ansys (Mechanical, HFSS, Fluent, Circuit Designer), Genesys, PyBullet
- **Programming & Data Analysis:** MATLAB, Python, Java, Excel, Minitab, Statistical Analysis

PROFESSIONAL EXPERIENCE

Werfen Norcross, GA
R&D Systems Engineering Co-op *Jun 2025—Aug 2025*

- Executed GMP-compliant verification and validation protocols on two novel automated blood testing platforms; debugged over five hardware/software failures with hands-on repairs and cross-functional collaboration across internal teams and external manufacturers.
- Reduced reagent waste by 64% by optimizing pipettor parameters through data-driven DOE and assay constraint analysis.
- Investigated well spillage and fanning through root cause analysis by modeling centrifuge ramp profiles in Excel and analyzing packaging, storage, and lot variation in Minitab, exposing injection modeling defects in specific batches.

TTM Technologies Syracuse, NY
Radiofrequency (RF) and Microwave Engineering Intern *Jun 2023—Aug 2023*

- Evaluated RF component designs end-to-end by modeling manufacturability with tolerance cases in HFSS/AutoCAD, conducting hands-on testing with network analyzers, and continuously interpreting performance in Excel against customer specifications.
- Diagnosed a manufacturing defect by x-ray imaging internal structure, replicating in HFSS/AutoCAD, and validating with test data.

Cornell Electric Vehicles Ithaca, NY
Drivetrain Lead *Jan 2023—May 2023*

- Led 20 engineers in the first team-wide jigging and assembly project, integrating mechanical subsystems and achieving precise alignment using well-communicated, strategic, tolerance-driven jig design and coordination; instituted novel technical protocols.
- Collaborated with five team leads to make a data-driven motor selection by developing an Excel tool leveraging calculations to analyze torque, RPM, racetrack characteristics, and alignment with performance objectives.

Drivetrain Engineer *Oct 2020—Jan 2023*

- Designed, validated, and manufactured drivetrain parts using Autodesk Inventor, Ansys, and manual machining.
- Modeled holistic vehicle efficiency using physics calculations and specification-informed parameters to guide design decisions.

Adie Lab, Cornell University Ithaca, NY
Undergraduate Researcher *Jun 2023—May 2024*

- Innovated a mechanical setup enabling a 65 MHz increase in ultrasound frequency for an ARF-OCE (Acoustic Radiation Force-Optical Coherence Elastography) system, incorporating user feedback and accelerating clinical translation.
- Spearheaded use of finite element modeling to reconstruct phantom mechanics, predict ARF effects, and efficiently iterate designs.

Cornell University Ithaca, NY
Teaching Assistant for Introduction to Controlled Fusion *Jan 2024—May 2024*

- Led lectures in professor's absence, conducted weekly office hours, and graded assignments and exams for a class of 30 students.

SELECTED PROJECTS

ElectroBottle | Innovation, Design, and Entrepreneurship, Columbia University *Sep 2025—Present*

- Designing an integrated smart water bottle system with electrolyte dispensing, intake tracking, and pulse oximetry to reduce cognitive load and improve treatment adherence for Postural Orthostatic Tachycardia Syndrome (POTS) patients.
- Applying firsthand lived experience and insights from 20+ discovery interviews with patients, clinicians, and industry experts to drive lean, human-centered design through a Columbia University/NSF-affiliated program.

Rainbow RoboCat | Robotics Studio, Columbia University *Jan 2025—May 2025*

- Owned full-cycle development of a walking quadruped robot under a tight five-month timeline and $100 budget by designing in CAD, integrating embedded systems and custom circuitry, fabricating using 3D printing, and programming in Python.
- Achieved a 38 cm/s optimized gait using ROS, machine learning techniques, and simulating in PyBullet.

CFD Modeling of Arterial Obstruction | Advanced Experimental Physics Lab, Cornell University *Jan 2024—May 2024*

- Simulated blood flow through healthy vs. obstructed bifurcating arteries in Ansys Fluent, applying CAD, meshing, and boundary condition setup to inspect velocity fields and wall shear stress.
- Uncovered a 7% increase in peak wall stress and identified regurgitation regions near obstruction, indicating elevated aneurysm risk; substantiated results through mesh convergence testing and conservation law checks.