# Ashley Miller

(973)-369-8444 | am6555@columbia.edu | linkedin.com/in/ashleymiller20 | engineerashley.com

## EDUCATION

**Columbia University** — New York, NY
*MS in Biomedical Engineering, GPA: 4.0/4.0* — *Sep 2024—Feb 2026*

**Cornell University** — Ithaca, NY
*BS in Engineering Physics, GPA: 3.5/4.0* — *Aug 2020—May 2024*

## TECHNICAL SKILLS

- **Design & Fabrication:** Solidworks, Autodesk Inventor, Fusion 360, AutoCAD, Engineering Drawings, DFM, GD&T, 3D Printing, Manual Mill/Lathe, Soldering, Laser Cutting, Embedded Systems
- **Simulation & FEA:** Ansys (Mechanical, HFSS, Fluent), Genesys, PyBullet
- **Programming & Data Analysis:** Python, MATLAB, C++, Java, Excel, Minitab, Statistical Analysis, DOE, ROS

## PROFESSIONAL EXPERIENCE

**Brekland** — Brooklyn, NY
*Mechanical Engineering Intern* — *Feb 2026—May 2026*

- Owned full-cycle development of two AI-assisted vision systems for servo-actuated precision sprayers by managing BOM, designed components in Fusion 360, and programming C++ controls in Arduino, delivering field-ready MVP in 3 months.
- Conceived novel object-selection algorithm and built Python GUI tools for system calibration and monitoring; authored operator documentation and market-informed commercialization roadmap.
- Engineered and 3D-printed custom mechanical mounting components and built a benchtop validation enclosure enabling structured, repeatable lab testing under real-world conditions to overcome environmental and cost constraints.

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

- Executed cGMP-compliant verification and validation protocols on two novel automated blood testing platforms; debugged 5+ 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 via root cause analysis, modeling centrifuge ramp profiles in Excel and analyzing packaging, storage, and lot variation in Minitab, exposing an injection molding defect in specific batches.

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

- Innovated mechanical components enabling a 65 MHz increase in ultrasound frequency for an ARF-OCE (Acoustic Radiation Force - Optical Coherence Elastography) biomedical imaging system, incorporating user feedback to accelerate clinical translation.
- Spearheaded FEA in Ansys to reconstruct phantom mechanical properties, predict acoustic radiation force effects, and validate against gold-standard testing equipment, bridging simulation and experimental biomechanics.

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

- Evaluated RF component designs end-to-end: modeled manufacturability via tolerance analysis in HFSS/AutoCAD, conducted hands-on testing with network analyzers, and benchmarked results against customer specifications in Excel.
- Diagnosed root cause of a manufacturing defect by x-ray imaging internal structure, reverse engineering in simulation, and validating with experimental test data.

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

- Led and trained 20 engineers in first team-wide jigging/assembly project, synchronizing all subsystems with tolerance-driven jig design; collaborated with five leads on data-driven motor selection, considering torque, RPM, and performance calculations.

*Drivetrain Engineer* — *Oct 2020—Jan 2023*

- Designed and manufactured drivetrain components (sprockets, brake mount, axles), leveraging Autodesk Inventor, Ansys stress analysis, and manual machining; modeled holistic vehicle efficiency with physics-based calculations.

## SELECTED PROJECTS

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

- Leading a team of 4 to design a smart water bottle for passive electrolyte and hydration tracking; grounding design in 20+ patient/expert interviews; modeling, prototyping, and testing 3+ novel electromechanical dispensing systems in Solidworks.

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

- Simulated blood flow through healthy vs. obstructed arteries in Ansys Fluent using CAD, meshing, and boundary conditions; uncovered 7% peak wall stress increase and identified regurgitation regions indicating elevated aneurysm risk.

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

- Owned full-cycle development of a walking quadruped robot with a $100 budget with Autodesk Inventor, Raspberry Pi, 3D printing, Python programming; achieved 38 cm/s optimized gait using ROS and ML-based gait optimization in PyBullet simulation.