# Faiza Huda

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## EDUCATION

**Cornell University – Ithaca, NY** | B.S. Mechanical Engineering | GPA: 3.54 | Expected May 2027
Relevant Coursework: Thermodynamics, Fluid Mechanics, Robotics, System Dynamics, Computer Aided Manufacturing, DFMEA, GD&T

## EXPERIENCE

**Cornell Mars Rover Project Team; Manufacturing Lead** Sept 2025 - present

- Lead the precision machining and assembly of mission-critical rover components, ensuring strict adherence to dimensional tolerances (±0.002”) across complex aluminum and composite materials.
- Manage a team of 20+ engineers and technicians, overseeing the full manufacturing lifecycle from concept to final assembly. Responsible for onboarding, training, and skill development, with a focus on process optimization and quality control.
- Sole CNC programmer/operator, developing G-code for multi-axis milling and turning operations. Optimized machining strategies for high-tolerance parts, applying Design for Manufacturability (DFMA) principles to minimize scrap, reduce costs, and enhance structural integrity.
- Drive improvement in manufacturing workflows by implementing Lean Manufacturing principles and 5S practices, improving efficiency and reducing lead times by 20%.

**Cornell Mars Rover Project Team; Drives and Astrotech Member** Jan 2025 - present

- Designed and integrated complex environmental testing systems for astrobiological research, including temperature, humidity, and gas sensors, alongside high-resolution imaging systems for planetary simulation environments.
- Designed and 3D-printed custom rover wheels, optimizing the geometry for traction and durability under extreme terrain conditions. Utilized parametric CAD design and multi-body dynamics (MBD) simulations to fine-tune the tread patterns and wheel structure for enhanced performance in desert-like environments.
- Currently developing the actuator stack system for the rover drive train, focusing on power transmission efficiency, torque optimization, and precision control.
- Engineering a regolith sampling auger system, employing FEA and material science principles to select high-strength steels and composite materials. Optimized the system for power efficiency, low wear, and high torque transfer to ensure performance under simulated Martian soil conditions.
- Serve as an advisor to the suspension system design, providing input on geometry, load distribution, and material selection to optimize vehicle handling and stability under variable terrain conditions.

**Emerson Machine Shop; Engineering Intern** May 2025 - Aug 2025

- Managed machining operations in a high-precision environment, overseeing CNC lathes, mills, and EDM machines, ensuring alignment with engineering specifications and tolerances (±0.001”).
- Developed and delivered advanced training programs in CNC programming (G-code), machining techniques, and safety protocols for faculty and students.
- Collaborated on the $2M modernization of machining equipment, overseeing the retrofit of CNC systems and upgrading machine controls for increased automation and precision.

**Bio-Inspired Fluids Lab, Cornell University; Assistant Researcher** Sept 2024 - Jan 2025

- Developed soft actuators with embedded PDMS fluid channels for soft robotics applications, utilizing rapid prototyping methods (FDM and SLA) for complex geometries. Engineered actuators with optimized fluidic properties to achieve precise control over shape deformation.
- Conducted detailed fluid dynamics simulations and performed mechanical characterization of soft actuators, including tensile testing and dynamic response analysis, to assess their behavior under varying pressure and environmental conditions.
- Designed custom injection molds for elastomeric actuators, reducing mold cycle time by 30%. Applied mold-flow analysis to optimize part consistency and minimize defects, significantly accelerating the development of new prototypes.

## SKILLS

**CAD & Design:** Fusion 360, Inventor, Vault Professional, SolidWorks, GD&T, Siemens NX
**Software/programming:** Python, Java, ROS, Ansys (FEA), Matlab, Arduino
**Hands-On:** CNC & manual machining, mill/lathe, 3D printing, soldering
**Professional:** Leadership, project management, collaboration, technical communication, Six Sigma