NYAEM MOSTAFA

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EDUCATION

New York University, Tandon School of Engineering Expected Graduation: May 2027
B.S. in Mechanical Engineering, Minor in Robotics

SKILLS

Design & Analysis	SolidWorks, ANSYS Mechanical, ANSYS Fluent, Fusion 360, Onshape, GD&T
Manufacturing	3D printing (FDM, SLA), injection molding, laser cutting, waterjet cutting
Programming	MATLAB, Simulink, Python (MuJoCo), Git, NumPy, Arduino, LaTeX

EXPERIENCE

Research Assistant, Flexible AI-Enabled Mechatronics Systems Laboratory **December 2025 - Present**

- Developed flexible and biocompatible tubes for a robotic endoscope device, scalable to 1.3 mm diameter for FDA clearance
- Worked with robotics engineers to develop a miniaturized hydraulic actuation system for precise control in urological surgery

Research Fellow, NYU Undergraduate Summer Research Program **June 2025 - August 2025**

- Developed a lightweight soft hand exoskeleton with $0.08/unit production costs and 5-minute polypropylene 3D print time
- Analyzed velocity and pressure plots during hydraulic actuation using ANSYS CFD to reveal fluid flow and pressure buildup
- Tested the lifting of 5 fingers weighing 30 grams, achieving a 90° bend under 3.1 grams and lifting a total load of 6.2 grams

Student Instructor, Mentoring in Medicine Internship Program **June 2024 - August 2024**

- Mentored over 40 K-12 students with analyzing online healthcare data, creating surveys, and designing research posters

PROJECTS

Soft Robotic Humanoid Hand, Mechanical Lead **September 2025 - December 2025**

- Designed a humanoid hand assembly with SolidWorks, enhancing toughness and flexibility with CF and TPU 3D printing
- Fabricated 10 soft fingers with silicone molding, optimizing biocompatibility and safe human-robot interaction
- Led a 30-member team by assigning CAD and FEA tasks, managing deadlines, and delivering soft robotics workshops
- Collaborated with electrical engineering students to integrate pneumatic tubing, haptic feedback motors, and flexible sensors

Soft Robotic Gripper **January 2025 - May 2025**

- Developed 3 soft grippers for a robotic arm with SolidWorks and SLA 3D printing, implementing a hyperbolic paraboloid geometry along the pneumatic actuation network to optimize strain distribution and fatigue resistance
- Tested grippers on objects of varying shapes and fragility to achieve a 90% success and validating sensor reliability

Autonomous Space Rover **January 2024 - May 2025**

- Manufactured 4 rover wheels by assembling hubs, sawing threaded rods, and malleting 12 water-jet aluminum cleats for each wheel, improving wheel stability and durability for BP-1 regolith traversal over plastic cleats
- Integrated motors into a deposition system with a redesigned casing to optimize spacing and NASA regolith tolerances
- Installed 10 shovel attachments and conducted 3 excavation tests on an excavation system to validate stability and durability

Automatic Card Dispenser **September 2023 - December 2023**

- Designed 20 parts of a playing card dispenser using Fusion 360 and Onshape, integrating 2 motors, microcontrollers, and electronic components to stay intact during dispenser rotation

EXTRACURRICULARS

NYU Tandon MedTech Club - Founder & President

- Hosted events to educate engineering students about medical devices, featuring physicians, professors, and student innovators

PUBLICATIONS

Rethinking Human Robot Interaction through Soft Robotics Learning Approach - ASEE MECH, 2026