Sana F. Hafeez

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA   May 2026
- Mechanical Engineering, Master of Science - Research Track
- Research in the application and control of mobile manipulators at the Computational Engineering and Robotics Lab (CERLAB)
- 4.0/4.0

Georgia Institute of Technology, Atlanta, GA   May 2024
- Mechanical Engineering, Bachelor of Science
- Concentration in Automation and Robotic Systems
- High Honors

PROFESSIONAL EXPERIENCE

Intuitive Surgical, *Manufacturing Engineering Intern, Systems*   Summer 2024
- Utilized Ishikawa method to identify root cause of manufacturing failures for a PCA integration tool and created a redesign for the tool saving an estimated $60,000 annually
- Executed pest control IQOQ during building qualification for new manufacturing facility
- Supported manufacturing line transfer PPQ for gen 4 systems
- Performed data analysis for cross functional teams determining primary failure mode for vendor supplied component

Amazon Robotics, *Hardware Development Engineer Co-op*   January 2022 – June 2022
- Won innovation contest, competing against full-time engineers, to improve delivery van packing capabilities with robotic solution
- Designed and prototyped mechanical systems and support infrastructure for autonomous units intended for micro fulfillment centers
- Executed testing procedures to establish efficacy of developing pick and place programs

Invention Studio at Georgia Tech, Makerspace, Atlanta, GA   December 2021- May 2024
- Spearheaded introduction of metal-composite 3D printing including equipment scoping and implementation of operating procedures
- Technical lead responsible for repair, maintenance, supplying of 50 FDM, SLA, and specialty 3D-printers valuing $200,000 total
- Developed protocols and trained ~500 students, researchers, faculty to assist in design process from ideation to manufacturing

Georgia Tech Research Institute, *Undergraduate Research Intern, Dr. Mick West*   May 2021 - July 2021
- Designed enclosure for underwater robot's communication system (Lagrangian Float)
- Repair and identification of point of failures including malfunctioning variable buoyancy pressure vessel

RESEARCH AND PROJECTS

Total Shoulder Arthroplasty Retractor Set, restor3d   January 2024 – May 2024
- Won "Best Mechanical Engineering Project" at Georgia Tech's Capstone Expo, exhibition with over 200 projects by senior students
- Developed five retractors to outperform existing options by optimizing glenoid access and minimizing tissue damage
- Partnered with orthopedic surgeons to integrate essential design elements, enabling machined prototypes to undergo cadaver testing and achieve medical approval for surgical use

Multi-Material 3D Printing & Sintering, Dr. Ellen Mazumdar, Atlanta, GA   August 2022 – August 2023
- Characterization of 3D-printed metal-PLA composites investigating applicability in mechanical and electrical systems
- Designed and implemented testing procedures for mechanical properties of sintered components following ASTM standards
- Won President Undergraduate Research Award for project proposal

Aqua-Bots, Dr. Mick West, Atlanta, GA   August 2019 – December 2021
- Designed chambers of a modular autonomous underwater vehicle capable of exploring the Antarctic ice shelf using SolidWorks
- Conducted thermo-fluid analysis to verify thermal limits of electronics bay would not be exceeded
- Coordinator for project development timeline, team deliverables, and lab presentations

LEADERSHIP

Competitive Robotics Team, RoboJackets

Secretary, Mechanical Trainer   April 2021 – December 2021
- Developed lecture series focused on introductions to CAD, mechanical design, and manufacturing processes
- Trained 60 first year students on machine operation and prototyping in preparation for their sub-team projects
- Concurrently managed logistics for meetings, administration, and resource requests for of 400 members

SKILLS

Software: MATLAB, Python, Simulink, Java, SolidWorks, Siemens NX, Inventor, Fusion 360, AutoCAD, LabVIEW, Microsoft Office Suite, SAP, Agile, Windchill, Blender

Technical: 3D Printing Repair and Maintenance (Ultimaker, Formlabs, Markforged, Creality Belt), CNC Milling, Manual Milling, Metal Machining, Wood Machining, Water Jet, Laser Cutter, Arduino, Soldering, CNC

Concepts: Robotics, Soft Robotics, Multivariable Linear Controls, Engineering Computation, Control Design Systems, Motion Systems, Computer Vision, Additive Manufacturing, Advanced Part Modeling, Design for Manufacturing, Machine Design, Electromechanical Systems, Material Selection