

Amanda “Mandy” Rafferty

(484) 213-1385 – mraffert@andrew.cmu.edu – www.linkedin.com/in/mandyrafferty – mandyrafferty.github.io

EDUCATION

Carnegie Mellon University, Pittsburgh, PA

December 2025

Master of Science in Mechanical Engineering, GPA: 3.9/4.0

Current Relevant Courses: Finite Elemental Analysis, DIY Design & Fabrication, Electromechanical Systems Design

Rutgers University, New Brunswick, NJ

May 2023

Bachelor of Science in Biomedical Engineering, GPA: 3.5/4.0

Awards & Honors: Dean’s List for 6 semesters, James Dickson Carr Scholarship, Honors College, Magna Cum Laude

PROJECTS

Remote Controlled De-Icing Robot for Snow and Ice

January 2025 – April 2025

- Tested four CAD-modeled sprocket design iterations for tracked locomotion, enabling the robot to traverse slopes.
- Constructed a 3D printed dual-nozzle salt dispensing system spraying at 45° angles, enabling both stair and ground coverage while minimizing material waste.
- Integrated mechanical and electrical systems, providing product features such as the ability to identify obstacles, avoid collisions, and detect low salt solution levels.

Integration of Granular Jamming into Medical Casts

September 2024 – December 2024

- Designed and prototyped a 165-gram variable-stiffness medical cast, improving traditional rigid casting methods.
- Fabricated a wrist brace that incorporates granular jamming, introducing a novel design that conforms to different anatomies and has a stiffness that varies up to nearly 50 times stiffer than the soft state.

Senior Design: Bone Density Indicator

September 2022 – May 2023

- Prototyped an osteoporotic bone detection device using SolidWorks and integrated electronic sensors with MATLAB GUI to display bone density calculations, increasing affordability and portability of bone density measuring technology.
- Conducted compressive tests on Bone Density Modeling blocks with an Instron machine and analyzed data in Microsoft Excel, improving the accuracy of the bone density modeling equation.

Engineers Without Borders

Spring 2020 – May 2023

Financial Subcommittee Lead, Kenya Project Lead

- Collaborated with professional mentors, hydrogeologists, and subcommittees to improve water systems for five schools and a hospital in Kolumbo, Kenya, increasing access to clean water for a community of over 7,000 people.
- Surveyed key stakeholders in Kolumbo, Kenya and assessed water systems to develop comprehensive implementation phases to improve the borehole well infrastructure.

EXPERIENCE

Strongarm Designs, Horsham, PA

August 2023 – August 2024, June 2025 – August 2025

Quality Engineer

- Led 20+ deviation investigations across manufacturing processes using root-cause tools (5 Whys, fishbone diagrams) and data systems (Visual ERP, Excel); developed CAPAs to reduce 92% of future recurrences.
- Assessed existing QMS against ISO 9001 requirements, identified compliance gaps, positioning company for successful ISO certification.
- Digitized and optimized procedures for over 75 employees, driving continuous improvement of the quality system and streamlining operational efficiency across multiple departments.

DiFabio's Restaurant, Media, PA

July 2022 – January 2023

Associate

- Managed inventory, processed payments, and maintained service areas, optimizing operational efficiency.

Temple University Hospital, Philadelphia, PA

May 2021 – August 2021

Intern

- Executed standard safety and infection control policies for COVID-19, ensuring hospital met health regulations.
- Collaborated with nursing leadership, improving delivery of care and enhancing patient well-being.
- Coordinated front-line operations, including managing visitor flow, enhancing organizational efficiency.

SKILLS

Technical: ANSYS, SolidWorks, Fusion 360, Microsoft Office 365, MATLAB, C++, Visual ERP, Augmentir

Design & Development: Concept-to-Prototype Development, Manual Machining, Welding, Metalworking

Quality: Six Sigma Green Belt, ISO 9001, CAPAs, 8D, SOPs, Root Cause Analysis