

# Amanda “Mandy” Rafferty

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## 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 Kolunje, Kenya, increasing access to clean water for a community of over 7,000 people.
- Surveyed key stakeholders in Kolunje, 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