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 with cross-functional teams using root-cause tools (5 Whys, fishbone diagrams) and data systems (Visual ERP, Excel); developed CAPAs to reduce 92% of future recurrences of non-conformances.
• Established new and improved existing process documentation to align QMS with ISO 9001 requirements by identifying compliance gaps to position the 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