Lauren G. Paffrath

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Personal Portfolio: https://Lauren-Paffrath.netlify.app

Education

Duke University
Masters of Engineering in Medical Technology Design — Anticipated Graduation: Dec 2026

University of Central Florida
Bachelor of Science in Mechanical Engineering - GPA: 3.7 — Graduated: Dec 2024
Minor in Bioengineering - Burnett Honors College

Experience

Product Design Engineering Intern - Exactech — May 2025 - August 2025
- Developed and executed a simulated use validation protocol for a cadaver lab study with 8 orthopedic surgeons
- Designed a tibial reamer with detachable, stackable mechanism in NX Siemens, including DFM for metal machining
- Wrote QMS design control documentation (tech reports, protocols) and gap analyses of ISO/ASTM standards
- Streamlined inspection by coordinating updates among vendor, drafting, and quality to ensure clear GD&T on prints

Product Development Engineering Intern - Grace Medical — May 2023 - August 2023
- Formulated a technique for laser welding exotic alloys utilized in implants, enhancing manufacturability
- Produced 3D printed and injection silicone molded ear anatomy and tympanic membrane models for marketing
- Participated in the implant trial at UT's cadaver lab, observing the product's functionality in cadaver specimens
- Redesigned SolidWorks models and drawings of ear implants and tubes, ensuring design consistency

Engineering Intern - BioDesign Clinical Immersion Program — June 2022 - July 2022
- Collaborated with physical therapists and patients to identify clinical needs and brainstormed engineering ideas
- Created a device concept and project plan addressing the top user need: preventing patient falls during PT sessions

Research

Honors Undergraduate Thesis - WEAR Lab — Aug 2022 - Jan 2024
- Spearheaded an assistive device that couples the upper limbs to the lower limbs to enhance walking during push-off
- Conducted a pilot study using EMG and IMU, and data analysis with MATLAB to investigate gait patterns and results
- Authored thesis paper and defended in a presentation to a board of 3 faculty experts in rehabilitation engineering

Biomedical Engineering Researcher - IRL Robotics Lab — Nov 2020 - May 2023
- Implemented innovative methods to create an autonomous system for drilling and performing knee arthroplasty
- Designed and constructed a 4-degree-of-freedom robotic manipulator for MRI guided prostate needle biopsy
- Programmed 4 rotational disks to track and precisely locate target coordinates based on MRI guidance

Presenter - RAMSES Robotic Microsurgery Conference — Nov 2022
- Lectured on *Design and Analysis of a Semi-Robotic Tool Support System for Laparoscopic Surgery* for 20+ surgeons
- Devised a pedal-controlled system enabling secure positioning and locking laparoscopic instruments for precision

Projects

Team Lead - Push-Off Assistive Exoboot - Senior Design Project — May 2024 - Dec 2025
- Developed an advanced foot orthotic to assist individuals with gastrocnemius and ankle deficiencies in walking
- Lead the electronics and software by designing PCBs in Fusion 360 and developing gait detection in Arduino
- Constructed project plan using HOQ and Gantt charts. Placed POs accommodating a schedule and a limited budget

Leadership

Exec Member/Secretary - Biomedical Engineering Society — Aug 2021 - Dec 2025
- Coordinated a cross-functional CAD workshop for medical students, teaching SolidWorks skills for medical devices

Theta Tau - Professional Engineering Fraternity — Jan 2020 - Dec 2025
- Hosted professional, community service, and recreational events for over 150 people within a budget of $2,500

Skills

Experienced in: SolidWorks · NX Siemens · Fusion · 3D printing · Prototyping · Technical Writing · Excel · Cadaver Lab
Familiar with: GD&T · Design for Manufacturability(DFM) · PCB Design · Arduino · MATLAB · Python · LabView · FEA