Lauren G. Paffrath

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Education

University of Central Florida

Bachelor of Science in Mechanical Engineering - GPA: 3.7 — Anticipated Graduation: Fall 2024

Minor in Bioengineering - Burnett Honors College - Honors Undergraduate Thesis

Experience

Grace Medical - Product Development Engineering Internship — May 2023 - August 2023

- Revised SolidWorks models and drawings of ear implants and tubes, concurrently writing an engineering report
- 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

WEAR Lab - Honors Undergraduate Thesis — Aug 2022 - Jan 2024

- Spearheaded an assistive device that couples the arms to the ankle to help with plantarflexion during push-off
- Conducted a pilot study using EMG and IMU, and analyzed data with Matlab to investigate gait patterns and results
- Created and prototyped parts, including pulleys, using SolidWorks and 3D printing for an assistive rehab system

Interventional Robotics Lab - Biomedical Engineering Research Position — Nov 2020 - May 2023

- Implemented innovative methods to create an autonomous system for drilling and preforming 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

BioDesign Clinical Immersion Internship — June 2022 - July 2022

- Collaborated with physical therapists and patients to identify clinical needs and translate them into solutions
- Brainstormed 110 engineering design ideas aimed at enhancing challenges faced by clinicians in their daily practice

RAMSES Robotic Microsurgery Conference Presentation — 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

Biomedical Engineering Society Annual Conference — Oct 2022

- Presented a poster on the *Safety Analysis of a Tissue Retraction Ring* for its application during knee arthroplasty
- Innovated the design of a tissue retraction ring, ensuring protection of surrounding tissue from potential damage

Projects

Push-Off Assistive Exoboot - UCF Senior Design Project - *Team Lead* — May 2024 - Present

- Developing an advanced foot orthotic to assist individuals with gastrocnemius and ankle deficiencies in walking
- Researching Ankle Foot Orthotic mechanisms to identify and select optimal components for the design process
- Organizing weekly meetings to establish clear objectives, set goals, and delegate assignments for a team of five

Robotic Arm Chess Board — Aug 2018 - May 2019

- Designed and fabricated a robotic arm capable of playing chess with precision and accuracy using Fusion 360
- Fabricated a 6-axis robotic arm with electromagnetic capabilities, enabling movement of pieces across the board
- Traveled to MIT to showcase my project to esteemed faculty, gaining valuable insights for its further development

Involvement

Biomedical Engineering Society — Aug 2021 - Present

Exec Member - Secretary (Fall 2021)

- Organized a CAD workshop in partnership with UCF Engineering in Medicine club to teach students SolidWorks
- Coordinated talks by 3 professors on UCF research and arranged a tour of the BRaIN Lab's motion capture system

Theta Tau - Professional Engineering Fraternity — Jan 2020 - Present

Recruitment Committee (Fall 2022)

- Hosted professional, community service, and recreational events for over 150 people within a budget of $2,500
- Coordinated outreach through collegewide emails, remind lists, social media, and speaking in 100 class sessions

Skills

Experienced in: SolidWorks, 3D printing, Research Writing, Microsoft Office, Outlook, Slack

Familiar with: Fusion 360, Rhinoceros 3D, Microsoft Excel, Arduino, Design of Experiments (DoE)