OSCAR OLIVA

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EDUCATION

University of Pittsburgh – Swanson School of Engineering — Expected Graduation April 2025

- Bachelor of Science in Mechanical Engineering
- Minor in Bioengineering

SKILLS

● SolidWorks ● Fusion360 ● MATLAB ● Python ● R ● Microsoft Office ●Instron Testing
● Rapid Prototyping – Soldering, Sewing, Injection molding ● Technical Writing/Presenting ● Spanish (Fluent)

ENGINEERING EXPERIENCE

Human Movement and Balance Laboratory, Department of Bioengineering — **Pittsburgh, PA**

Research Assistant (only while enrolled in classes) — *November 2021 – Present*

- Enhanced a portable scanner which used frustrated total internal reflection (FTIR) technology by integrating a Raspberry Pi and camera to capture and store tread wear images upon user interaction.
- Developed MATLAB-based image processing software to identify worn shoe regions from FTIR data and utilized Python to correlate image brightness with pressure exerted on the shoe.
- Adapted tribology testing equipment to evaluate friction on various ladder rungs under dry and contaminated conditions; designed custom supports and established a robust testing protocol.
- Analyzed tribology data in MATLAB to quantify relationships between surface patterns, materials, rung geometries, and coefficients of friction.
- Conducted gait analysis using Vicon motion capture to study participant movement during ladder ascent, descent, and unexpected slip scenarios.

ZOLL LifeVest — **Pittsburgh, PA**

Human Factors Engineering CO-OP (three 4-month rotations) — *September 2022 – April 2024*

- Conducted post-market surveillance analysis on an existing product, contributing to the HFE/UE validation report submitted to the FDA for the next-generation product.
- Developed protocols for wear test evaluations and moderated studies by interviewing participants to assess comfort, usability, and the effectiveness of error-prevention features of the LifeVest system.
- Leveraged R and Power BI to analyze study data, prepared detailed reports, presented findings, and collaborated with a multidisciplinary engineering team to address critical use errors.

Advanced Research / Advanced Development — *May 2024 – July 2024*

- Designed a prototype LifeVest garment to enhance patient comfort while maintaining ECG quality by incorporating fabric electrodes and relocating circuitry to the garment's exterior.
- Applied 3D scanning to capture patient body measurements for garment sizing and analyzed correlations between ECG wave amplitudes and electrode placement across the body.

Desapro Inc., Rockledge, FL

Mechanical Engineering Intern — May 2022 – August 2022

- Drafted SolidWorks models of aluminum transit cases and prepared detailed production-ready drawings.
- Evaluated and optimized the manufacturability of sheet metal-fabricated cases.
- Collaborated with customers to deliver custom cases tailored to specific size, weight, and load-bearing requirements, leading both design and manufacturing efforts.
- Designed a temperature-controlled case for drone transport of blood bags to soldiers in combat scenarios.
- Developed and oversaw the manufacturing of a case designed to minimize harmful vibrations and impact shock.

PROJECTS

Hydraulic Sliding Wall Squat Machine – Senior Capstone

- Designed and prototyped a squat machine for lower-body injury rehabilitation, incorporating a harness and a hydraulic system to reduce the force required during completion of a squat.
- Presented the completed prototype at the Engineering Senior Design Expo, earning the People's Choice Award.

Engineering Portfolio

- Detailed descriptions of projects are available via the QR code at the top of this document or at: https://oaoliva.github.io/