Joseph A. Groom

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joseph-groom.com

EDUCATION

Bachelor of Science in Biomedical Engineering, USF GPA: 3.86 — Graduation 2026

University of South Florida. Tampa, FL

Honors & Awards:

Florida Bright Futures Academic Scholars

USF Green & Gold Scholars Award

SKILLS

Software: Tinker CAD, Java, LTspice

Certifications: MATLAB, C++, HTML and CSS, Microsoft Office (Excel, Publisher)

Laboratory: Safe Lab management

BIOMEDICAL ENGINEERING EXPERIENCE

USF TTEB Lab Translational Tissue Engineering and Biofabrication Laboratory – Dr. Neda Latifi

Undergraduate Research Assistant — May 2024 – Dec 2024

- Developing expertise in electrospinning polymers to create nanofiber sheets, testing their mechanical properties using a biaxial tester.
- Presenting research articles on heart-valve tissue engineering, biomechanics, biomaterials, and electrospinning
- Researched elastic fiber synthesis for heart valve engineering

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Digital Signal Filtering & Analysis for ECG Data, Engineering Project — Spring 23 - Fall 24

- Developed a digital signal processing pipeline in MATLAB to isolate and analyze individual ECG waveform components.
- Conducted waveform decomposition to assess individual ECG components, enabling precise biomedical signal analysis.
- Utilized Symbolic Math Toolbox and differential equations to mathematically model and filter ECG signals.
- Demonstrated expertise in MATLAB programming, mathematical modeling, and biomedical engineering applications.

Pulse Oximeter Noise Filtration, Engineering Project — Fall 2024

- Designed and simulated a noise filtration system for LED pulse oximeter signals using LTspice, optimizing signal clarity.
- Implemented MATLAB for data acquisition, graphing, and analysis of filtered physiological signals.
- Balanced cost and functionality, tracking circuit expenses to ensure an optimal design within budget constraints.
- Applied signal processing techniques to improve raw biomedical data quality for accurate analysis.

Gru-mobile, Engineering Project, Software/Hardware Lead — Fall 2022

- Programed an atmega328p microcontroller to communicate with two separate inputs, IR and ultrasonic sensors, and four outputs allowing for fully automated following motion including turning and speed regulation
- Managed team meetings and communication among 5 different leads over a 15-week period.
- Developed and distributed surveys that garnered over 50 responses, along with targeted advertisements and flyers, to successfully promote the Gru-mobile.

AFFILIATIONS & LEADERSHIP

Engineers Without Boarders — Aug. 2022 to Present