Trevor Overton *Neuroengineering Student*

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Education

Bachelor of Science in Biomedical Sciences, Neuroscience Track, University of Central Florida
Aug 2023 – May 2027
GPA: 3.99 / 4.0
- Minor in Electrical Engineering
- Minor in Mathematics
- Honors Interdisciplinary Thesis in Electrical Engineering: "Non-Invasive Biomimetic Peripheral Nerve Stimulation Using Finite-Element Modeling", Chair: Prof. Mohsen Rakhshan, Ph.D.

Publications

Z. Al-Mashhadani, **T. Overton**, D. Wu, and M. Rakhshan, "Toward Plug and Play Myoelectric Control via One-Shot Latent Representation Alignment," *IEEE Trans Neural Syst Rehabil Eng*, 2025. doi: 10.1109/tnsre.2025.3626255 ⊘

Under Review

T. Overton, Z. Al-Mashhadani, S. Y. Raza, J. Whitson, and M. Rakhshan, "Limb Position Effect in Myoelectric Control: Strategies for Optimisation and Standardisation," in review at *J. Neural Eng*, preprint doi: 10.1101/2025.09.01.673545 ⊘

H. Mahdavi*, E. Naeemi*, **T. Overton***, F. Fregni, F. Padilla, A. Manbachi, R. Abdolvand, L. J. Brattain, and M. Rakhshan, "Focused Ultrasound System Design Considerations Based on the Applications for the Peripheral Nervous System," in review at *IEEE Trans Biomed Eng*. (*shows equal contribution)

Research Experience

Laboratory for Interaction of Machine and Brain (LIMB), Undergraduate Research Assistant
Oct 2023 – present
Orlando, FL

Research Project on the Limb Position Effect of Myoelectric Control:
- Designed, fabricated, and programmed an open-source experimental data acquisition system (GitHub documentation ⊘) to guide 19 subjects, including one with an upper-limb difference.
- Developed a data collection pipeline in Python, recording 8 channels of EMG and 4 IMUs.
- Performed offline and online data analysis and visualization using Python, implementing machine learning models to compare classifier accuracy across limb positions and motions.

Literature Review on Focused Ultrasound Neuromodulation of Peripheral Nerves:
- Synthesized findings from over 100 articles on focused ultrasound in the PNS, creating original figures and tables to co-first-author a manuscript under review at *IEEE TBME*.

Thesis Project on Finite-Element Modeling for Non-Invasive Biomimetic Stimulation:
- Recieved a $750 undergraduate research grant to fabricate biophysically realistic gelatin phantoms, testing a finite-element model of the transient electric field through a human forearm.
- Created a finite-element model with ultrasound imaging data, and compared it to the electrical stimulation of 1 subject. Presented this pilot study at an international conference.
- Finding biomimetic stimulation parameters for naturalistic sensory feedback by modeling neurons

Presentations

Poster Presentation at the IEEE 12th International Conference on Neural Engineering
Nov 2025
San Diego, CA
Ultrasound-Guided Finite-Element Modeling for Transcutaneous Electrical Nerve Stimulation: A Pilot Study

Oral Presentation at Gulf Coast Undergraduate Research Symposium
Nov 2024
Houston, TX
Examining the Trade-off Between Training Burden and Robustness to the Limb Position Effect in Myoelectric Control

Poster Presentation at the 46th International IEEE EMBS Conference
Jul 2024
Orlando, FL
Designing Robust Myoelectric Control by Considering Two-Dimensional Arm Positions

Awards

Honors Undergraduate Thesis Scholarship Award, Burnett Honors College, UCF — Oct 2025

Undergraduate Student Research Grant, Office of Undergraduate Research, UCF — Aug 2025

Summer Undergraduate Research Fellowship, Office of Undergraduate Research, UCF — May 2025

Outstanding Undergraduate Researcher Award, ECE Department, UCF — Apr 2025

Deepak Pathak Memorial Scholarship, Burnett Honors College, UCF — Nov 2024

Languages

English: Native proficiency • **French:** Elementary proficiency (early A1) • **German:** Elementary proficiency (high A1)