

Robin Perry Mayrand

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RESEARCH & WORK EXPERIENCE

Brain Institute Intern – Nicklaus Children’s Hospital, Miami, FL *Jun 2021 – Present*

- Partner with the epilepsy department’s doctors and technicians to explore the medical data available to best fit a machine learning algorithm solution.
- Develop an automated solution with a higher accuracy for the source-localization and spike detection of epileptic seizures.

Graduate Student Researcher – CATE Center, Miami, FL *Jan 2019 – Present*

- Lead a project to create an automated online MRI and PET processing tool for use by Alzheimer’s Disease researchers and doctors, leading to a \$5.5M grant from the National Science Foundation.
- Collaborate with medical Alzheimer’s Disease lead researchers and doctors from Mount Sinai, the University of Miami, and the University of Florida to produce accurate correction techniques to accelerate and facilitate their diagnosis process.

Graduate Research Assistant – HCPS Lab, Miami, FL *Apr 2016 – Jan 2019*

- Researched and compiled state-of-the-art affective computing methodologies for use in human computer interactions such as analog biometric instrumentation techniques into a review paper comparing the effectiveness, accuracy, and mobility of these methods.
- Collaborated with UM Health Group to investigate Parkinson’s Disease tremors using a custom wrist-worn IMU-based device.
- Designed and assembled an EEG-recording embedded wireless system on a 4-layer PCB device via EAGLE.
- Performed electronic testing of PCB based on schematic and expected voltage point.
- Identified the best technique to rapidly solder SMD components manually using a decal and oven to avoid short circuits.

PROJECT EXPERIENCE

Neuroimaging Web Services Interface Pipeline – CATE Center, Miami, FL *Feb 2021 – Jun 2021*

- Devised an improved and automated pipeline that decreased the total processing time by 60% while also freeing up the engineering team’s time and resources.
- Consolidated and cleaned medical imaging data from various partnered facilities via automated python code into an organized database for research and medical use.
- Managed and trained a team of 4 engineers to validate and analyze the new pipeline via a quantitative analysis and manual review of MRI-PET registration, improving the quality control by 10%.

PD Tremor Transcranial Magnetic Stimulation Device – CATE Center, Miami, FL *May 2019*

- Reproduced a CATE-owned tremor-frequency feedback patent device in EAGLE based on a previous patent description of an analog to digital conversion circuit and an accelerometer circuit.
- Improved and simplified the design by replacing the accelerometer system with an inexpensive IMU chip. Employed the added gyroscope feature to improve the accuracy.
- Designed and 3D printed an ergonomic case for the device to be attached to the hand.
- Processed XYZ signals to display a frequency decomposition of the tremors for use by medical professionals during prognosis.

Low-Cost Modular People Counting Device – HCPS Lab, Miami, FL *Sep 2018 – Oct 2018*

- Developed a privacy-focused and affordable device for real-time human detection and counting using an RGB optical sensor and narrow beamed LEDs.
- Filtered multi-channel signals for use in a custom multi-spike detection algorithm with an ~85% accuracy.
- Tested and quantified the efficacy of ultrasound, infrared, UV, and RGB light with their respective sensors and setups to reach a high signal-to-noise ratio resulting in a higher spike resolution for further feature extraction.

EDUCATION

Florida International University – Miami, FL

PhD in Electrical Engineering, *GPA: 3.8/4.0*

May 2023

M.S. in Electrical Engineering, *GPA: 3.8/4.0*

May 2019

SKILLS

Technical: Python, ML, JavaScript, EAGLE, MATLAB/Octave, Freesurfer, FSL, HTML/CSS, MacOS, Windows, Linux, SMT PCB Design, Arduino, Optical Sensors, Ultrasound, Accelerometer, Gyroscope, IMU.

Medical: MRI, PET, CAT, ECG, EEG, EMG, Heart Rate.

Publications: 1 First Author, 2 Co-Author, 2 Co-Author pending review.