Allan Marcio Frederick

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LinkedIn profile Personal website

EDUCATION

Bachelor of Science, Electrical Engineering **December/2021**
Technical Core: Data Science and Information Processing
The University of Texas at Austin

Pursuing Master of Science, BioElectrical Engineering **August/2022 – Present**
Clinical Neuroprosthetics and Brain Interaction Lab
The University of Texas at Austin

PROJECTS

Ear–EEG Device, *The University of Texas Austin* **August/2022 – Present**
- Developing a novel in-ear EEG device using a conductive hydrogel to record EEG signals inside the ear
- Established both hardware and software optimization protocols to streamline device fabrication, recording, signal processing and analysis
- Fabricated conductive hydrogel in the lab to integrate with electrical components and earpiece
- Created specialized 3D ear models for printing, using SLA and FDM technologies to interface with hydrogel
- Designed experiment protocols with visual interface to record neural signals
- Performed signal processing and analysis of EEG data using MATLAB to evaluate the Ear-EEG device

IoT Brain Computer Interface, *The University of Texas Austin* **February/2023 – April/2023**
- Collaborated with one other team member to design and build an assistive BCI to control various IoT devices using object detection for selection and EEG Motor Imagery signals for binary control
- Implemented real-time object detection using Google Edge TPU, programmed microcontroller firmware
- Recorded EEG motor imagery data to train a classifier for online use
- Streamlined object detection model and EEG motor imagery decoder to microcontroller over wireless communication protocols

Automated Smoke Machine, *Baylor College of Medicine* **January/2023 – Present**
- Collaborating with a cross-disciplinary team to develop an automated cigarette smoker for in-vivo experiments to study the effects of smoke on the lungs of mice
- Responsible for the electrical and operating system design; includes raspberry pi and arduino serial communication for efficient control, operation sequence firmware, sensor processing, circuit design

WORK EXPERIENCE

Laboratory Technician, *Gonzalez-Lima Lab at The University of Texas Austin* **February/2022 – August/2022**
- Led the design and build of an LED neuromodulation device to improve brain function and cognition; involved PCB design, power testing, hardware hacking, embedded systems development
- Performed signal processing and analysis of EEG data using MATLAB to observe effects of infrared laser light on neural oscillations
- Participated in weekly meetings to delegate tasks and to provide updates on current projects

SKILLS

Programming: MATLAB, Python, Jupyter notebook, C/C++, OSX/Linux command line, EAGLE Autodesk
Applications: Machine-learning, signal processing, prototyping, PCB design, HW/SW integration, embedded sys
Languages: Fluent in Portuguese, Spanish