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

Relevant Coursework:
- Neural Engineering
- Brain-Computer Interaction
- Data Science and Machine Learning
- Digital Signal Processing
- Real-time Digital Signal Processing
- Neural Systems I and II

RESEARCH INTERESTS

- Cognitive enhancement
- Motor-imagery based BCI
- Neuromodulation of sensory processing
- Machine learning-reinforced biosensors

RESEARCH EXPERIENCE

Undergraduate Research Assistant, *Gonzalez-Lima Lab at The University of Texas Austin* **June/2021 – Aug/2021**
- Performed signal processing and statistical analysis of EEG data using MATLAB to observe effects of near-infrared laser light on human brain signals
- Partnered with graduate students to collect EEG data for an experiment involving stimulation of the pre-frontal cortex with near-infrared laser light to improve brain function and cognition
- Participated in weekly meetings to delegate tasks and to provide updates on current projects

Machine Learning Modeling for Cancer Research, *Baylor College of Medicine*   **June/2021 – August/2021**
- Applied feature extraction and selection methods among genetic data and evaluated machine learning models in MATLAB to predict survival outcomes of orophanargneal cancer
- Referenced as co-author of paper (found in publications section)

APPLIED ACADEMIC EXPERIENCE

Brain Stimulation Headset, *The University of Texas Austin*   **February/2021 – December/2021**
- Collaborated in a team of 5 to design and build a device to improve brain function and cognitive state using infrared LEDs
- Programmed firmware using C++, ensuring proper functionality of the microcontroller by implementing treatment operation sequence, ambient light detection, temperature detection, and blood oxygen level detection
- Led and coordinated meetings with faculty sponsor, to relay information, monitor progress, and present slides and system design reports

Error-related Potentials Decoder, *The University of Texas Austin*   **October/2021 – December/2021**
- Created a decoder to classify error-related potentials using signal processing and machine learning techniques conducted in MATLAB and Python
- Performed data visualization, spatial filtering, spectral filtering, feature extraction and selection, cross-validation techniques, model evaluation
- Configured data sets for training and testing of models in an efficient manner by use of code modularity
- Streamlined readability by evaluating and visually representing performance of models via figures for easy understanding

Meditation Classifier, *The University of Texas Austin*   **May/2021**
- Utilized a BCI module in Python to classify mental states in real time by reading EEG to provide biofeedback for mediation assistance
- Adapted the code to run on a raspberry PI connected via bluetooth to a Muse S EEG headband

Hurricane Damage Prediction, *The University of Texas Austin*   **October/2020 – December/2020**
- Partnered with a team of 5 to build a Cycle-Consistent Adversarial Network (CycleGAN) that uses image-to-image translation to predict flood damage from hurricanes
- Co-authored to publish the project in a [Medium article](#)

PROFESSIONAL EXPERIENCE

Software Engineering Intern, *IpayYou*   **June/2019 – August/2019**
- Developed software tools ranging from front-end to back-end for company administrators to increase efficiency and make future collaboration more streamlined

SKILLS

Programming: MATLAB, Python, Jupyter notebook, C/C++, C#, Java, OSX/Linux command line
Applications: Machine-learning, digital signal processing, software development, embedded systems
Fluent in Portuguese and Spanish
Keyboard player in alt rock band, familiar with Garageband music production software

CERTIFICATIONS

CITI Human subject research for social/behavioral researchers

PUBLICATIONS

Journal Papers Accepted
Sandulache, Vlad, et al. "Oropharyngeal cancer outcomes are driven by a complex interaction between p16 status, multinucleation and immune infiltration," Modern Pathology, In Press, 2022.