Vina Ro

North Potomac, MD | vina2329@gmail.com | (443)-529-6700 | https://vina2329.github.io/

SUMMARY

- 4 years of experience in data processing and analysis with a focus on biosignals (ECG, PPG, ECoG, EEG, PCG, etc.).
- 2 publications in peer-reviewed journals
- Possess expertise in developing machine learning algorithms for medical devices.
- Worked in cross function teams in a technically demanding environment.

EDUCATION

Master of Science and Engineering, Biomedical Engineering, **Johns Hopkins University**	Expected Dec 2022
Bachelor of Science, Biomedical Engineering, **National Yang Ming University**	Sep 2016 - June 2020

TECHNICAL SKILLS

Programming	Python (Scikit-learn, Tensorflow, Pandas, PyTorch, Keras), MATLAB, Machine Learning (ML), Deep Learning, SQL, R
Data Analysis/Visualization Software	Tableau, Power BI, Excel
Software	Git, AWS, Docker
Other Skills	Digital signal processing, animal experiments

WORK EXPERIENCE

Caduhammer   Taipei, Taiwan
Jr. Biomedical Data Scientist   May 2020 - Jul 2021

- Designed and programmed 3 sleep stage quantification algorithms from smartwatch sensors and PCG data for Parkinson's Disease.
- Analyzed raw ECG data from large databases and programmed an ML classification model for atrial fibrillation detection.
- Comprehended SaMD regulatory documents from 6 international institutions and submitted a written proposal for the design of regulatory SaMD validation processes to the Taiwanese FDA (TFDA). *Awarded a one-million NTD grant from the TFDA*
- Collaborated with colleagues to create a database of falling motion using multisensor data fusion, and programmed an ML fall detection algorithm which increased by 25% over the original model.
- Worked in multiple cross-function teams with industry (ASUS, Quanta Computers) and medical professionals.

RESEARCH EXPERIENCE

Johns Hopkins University   Baltimore, MD
Master Researcher   Sep 2021 - May 2022

Analysis of correlation between complex spikes and licking kinematics
- Investigated the relationship between the firing of complex spikes from the cerebellum and licking kinematics with time series data and statistical analysis techniques.

National Yang Ming University   Taipei, Taiwan
Undergraduate Researcher   Sep 2018 - May 2020

An ML-based brain machine interface regression model for hand gesture recognition and prediction
- Programmed spike sorting methods (PCA, template matching) from ECoG signals recorded from the University of Washington Medical Center.
- Designed data cleaning, preprocessing, and feature calculation workflows for sorted ECoG signals.
- Compared efficiency among 3 regression models (logistic regression, random forest, ANNs) developed via Python's Keras.
- Developed a 3D-CNN regression model that predicts the trajectory of finger movements with high accuracy.

A skeleton analysis-based fall detection method using depth cameras
- Lead a team project of 4 and won 4th place in the International Contest of Smart Technology Design for Long Term Health Care (out of 60 teams).
- Constructed a database consisting of different falling motions of the human skeleton recorded with depth cameras.
- Built a support vector machine classifier to predict falling motion occurrence within the camera range.

University of California San Diego   La Jolla, CA
Research Intern   Jul. 2018 - Aug. 2018

Simulation of spiking neural networks
- Evaluated different spiking neuron mathematical models from a variety of research articles.
- Experimented with different parameters (connectivity, synapses) to simulate spiking neural networks of the brain.

PUBLICATIONS

- Yi-Feng Ko et al., "Quantification Analysis of Sleep Based on Smartwatch Sensors for Parkinson's Disease." Biosensors. Jan. 2022.
- W.Chang et al., "Modulation of Theta-Band Local Field Potential Oscillations Across Brain Networks With Central Thalamic Deep Brain Stimulation to Enhance Spatial Working Memory," Front. Neurosci., vol. 13, Nov. 2019.