Vina Ro

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

SUMMARY

- 4 years of expertise in data acquisition, cleaning, and analysis with focus in biomedical data (ECG, ECoG, EEG, EMG, etc.).
- 2 publications in peer-reviewed journals and experience of collaboration with teams from interdisciplinary fields.
- Possess expertise in developing machine learning algorithms for medical device applications.

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
- *Awarded Academic Excellence Award 2020*

TECHNICAL SKILLS

Applied Statistics	A/B Testing, Hypothesis Testing, Linear & Logistic Regression, Classification
Programming	Python (Scikit-learn, Pandas, PyTorch, Keras), MATLAB, machine learning, SQL, R
Data Analysis/Visualization Software	Tableau, Excel
Other Skills	Digital signal processing, animal experiments, AWS

WORK EXPERIENCE

Computational Intelligence in Biomedical Data Science Lab — Taipei, Taiwan
Jr. Biomedical Data Scientist — May 2020 - Jul 2021

- Designed and programmed 3 sleep stage quantification algorithms based on smartwatch sensors for Parkinson's Disease (PD).
- Analyzed ECG data from smartwatch sensors and programmed an ML classification model for atrial fibrillation detection.
- 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-disciplinary collaborations among industry (ASUS, Quanta Computers) and medical institutions.

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 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 & PRESENTATIONS

- Yi-Feng Ko et al., "Quantification Analysis of Sleep Based on Smartwatch Sensors for Parkinson's Disease." Biosensors. 2022; 12(2):74.
- 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.
- **Vina Ro**, Gert Cauwenberghs, and Frederic Broccard, "Simulation of Spiking Neural Networks," UCSD International Summer Research Program Symposium, University of California, San Diego, Aug. 2018.