Vina Ro

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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 Chiao Tung 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 Chiao Tung 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 low MSE.

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.