Rui Gao

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Education & Scholarship

University of California, Los Angeles Sep 2024 - Present

Master of Science, Electrical and Computer Engineering

- Course: 236A Linear Programming, 205A Matrix Analysis, 214A Digital Speech Processing

Fudan University Sep 2020 - Jul 2024

Bachelor of Engineering, Biomedical Engineering, School of Information Science and Engineering

- Relevant coursework: Algorithm and Data Structure, Information Theory, Computer Architecture, Machine Learning, Digital Signal Processing, Signal and System, Image Processing
- GPA: 3.89/4.0, Ranking: 1/259
- Fudan University Distinguished Graduated Studnets(1%)

Research & Work Experience

Multimodal Graph Neural Networks for Depression Prediction Jul 2023 - Feb 2024

Advisor: Prof. Hatice Gunes, Dr. Batuhan Sayis, Cambridge University *Research Intern*

- Conducted a four-week study involving 20-42 participants to study changes in depression based on interactions with both a robot-assisted system(participants interacting with a robot) and a voice-assisted system.
- Collected and processed experiment data, including questionnaire data (mental health questionnaires, e.g. Panas or PHQ9) and physiological data (experimental ECG and EDA).
- Developed and realized a temporal multimodal graph neural network based on the Gratis model (a general graph representation learning framework) to predict participants' depression changes; wrote the final code.
- Published Paper:"Learning Graph Representation for Predicting Student Mental Wellbeing in Robot Assisted Journal Writing Context" on ACII 2024.

ECog Classification with Deep Learning Feb 2023 - May 2023

Advisor: Runfeng Miao, PhD Student, UC-Berkeley and UCSF joint program *Research Assistant*

- Developed and implemented transformer to decode ECog signals in motor imagery classification tasks.
- Applied transformer to the ECog signals improving performance from 73% to 80% compared with the baseline LSTM model.
- Formulated a new model by incorporating state-of-the-art techniques, improving accuracy from 80% to 85% by combining transformer and CNN models.

ECG Signal Processing May 2022 - Nov 2022

Advisor: Prof.Cuiwei Yang, Fudan University *Research Assistant*

- Processed and filtered raw ECG signals to remove baseline drift, power frequency interference, muscle artifact, and instrumentation noise.
- Employed threshold detection and wavelet coefficients to analyze ECG signals and extracted relevant features such as the R wave and P-R interval, resulting in improved signal classification accuracy.
- Designed and implemented a k-means cluster classification model based on ECG waveforms, QRS waves, and peaks, enabling the accurate detection of ECG signal symptoms to 92% and improving patient outcomes.

Leadership & Activities

Department of Organization Sep 2021 - Jul 2022

School of Information Science and Technology, Vice President

- Held the department's 'Information Festival' and provided students with premium lectures and activities.

National College Mathematics Competition Sep 2020

Third Prize

Technical Skills

Languages: Mandarin(native), English(fluent), French(novel)
Developer Tools: Python, MATLAB, C, AI coding