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Qirui Zheng

https://qz07.github.io

Education

University of California, San Diego — La Jolla, CA

B.S. in Data Science & Cognitive Science Spec. Machine Learning and Neural Computation — *Expected June 2026*

- **Minor**: Business Economics
- **GPA**: 3.87/4.0
- **Concentrations**: Deep Learning & Natural Language Processing
- **Coursework**: Data Structures & Algorithms, Statistical Methods, Probabilistic Modeling & ML, Data Management, Data Visualization, Representation Learning, Cloud Computing, Deep Learning, Reinforcement Learning

Work Experience

UC San Diego, CSE - Laboratory of Emerging Intelligence — La Jolla, CA

Research Intern — *June 2024 – Present*

- Adapted the state-of-the-art Structured State Space Model (SSM) Mamba, architecture for enhancing long-document information retrieval tasks.
- Generated extensive synthetic datasets using OpenAI's Batch API for model training and validation.
- Developed and implemented a Retrieval-Augmented Generation (RAG) pipeline to calculate model inference and retrieval accuracy.

UC San Diego - DSTL Lab — La Jolla, CA

Student Researcher — *March 2024 – October 2024*

- Worked under the mentorship of Professor Sam Lau to enhance Python Pandas learning through the development of annotative visualizations.
- Developed Pandas function call visualization with Python Pandas for data manipulation, and managed version control and collaboration using Git.
- Designed a case study to investigate the impact of visualizations on student learning, demonstrating that such tools significantly aid beginners in understanding data manipulation concepts.

Halıcıoğlu Data Science Institute — La Jolla, CA

Instructional Assistant — *March 2024 – Present*

- Tutored over 400 students in a sophomore-level Data Science course covering pandas, scikit-learn, and the data science life cycle.
- Held office hours to mentor students, enhancing their problem-solving skills through a question-based approach.
- Revised and created supplementary materials, to improve understanding of course topics.
- Updated Autograder test suites using an open-source framework and performed SSH debugging on student submissions.

Neural Engineering and Translation Labs (NEATLabs) — La Jolla, CA

Research Intern — *Feb 2024 – June 2024*

- Conducted parametric tests on EEG data from patients to analyze neural activity patterns.
- Preprocessed raw EEG signals using MATLAB and EEGLAB, enhancing data quality for analysis.
- Analyzed correlations between survey response scores and EEG data to identify significant trends.
- Developed personalized models for participants using traditional machine learning techniques.

Publications

- Ylesia Wu*, Qirui Zheng*, and Sam Lau. How novices use program visualizations to understand code that manipulates data tables. *Proceedings of the 56th ACM Technical Symposium on Computer Science Education V. 1*, 2025

Projects

Pattern Analysis on EEG Data for Enhanced Depression Diagnosis La Jolla, CA

Faculty Mentorship Program *Aug 2023 – May 2024*

- Worked under the mentorship of Professor Justin Eldridge to develop a machine learning approach for classifying depression based on EEG recordings.
- Handcrafted features from raw EEG data using techniques such as Fast Fourier Transform (FFT) and Independent Component Analysis (ICA) to identify key indicators for depression classification.
- Applied traditional machine learning algorithms to classify depression using the extracted features.

Skills

Languages: Python, Java, Javascript, C++, MATLAB

Technologies: Git, PyTorch, MySQL, AWS

Foreign Language: Native Speaker in Mandarin