Ziyuan Yin

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EDUCATION

University of California, Berkeley   **Berkeley, CA, USA**
Master of Engineering in Bioengineering (MEng)   Aug. 2024 – June 2025
GPA: 3.8/4
Specialization in Bioinformatics & Computational Biology and Neuroengineering

City University of Hong Kong   **Hong Kong SAR, China**
Bachelor of Engineering in Information Engineering   Sep. 2020 – June 2024
GPA: 3.6/4.3 | Rank: 1/58, First Class Honor, cum laude

University of Wisconsin-Madison   **Madison, WI, USA**
Exchange Program in Computer Engineering   Sep. 2023 – Dec. 2023
GPA: 4/4

RESEARCH INTERESTS

Neuro-semantics memory, Distributional Semantic Models, Brain- constrained deep neural networks, Time-series Signal Processing

PUBLICATIONS

[1] **Yin, Z.***, Luo, M.*, Kandhare, P., Karukonda, V., Jiang, F., Nagarajan, S., Amorim, E. "Time-aware Multiscale Hyperexcitability Trajectory Modeling in Cardiac Arrest." Manuscript under multi-center internal scientific review prior to journal submission, 2025. *Co-first authors.

[2] Xiao, B*., **Yin, Z***., Shan, Z. "Simulating Public Administration Crisis: A Novel Generative Agent-Based Simulation System to Lower Technology Barriers in Social Science Research." *arXiv:2311.06957*, 2023. doi:10.48550/arXiv.2311.06957. (36+ citations) *Co-first authors.

[3] **Yin, Z.**, Wong, M. T. L., Lan, C., Wong, S. H., Chan, R. H. M. "Non-Invasive Monitoring of Swallowing Function Using Multi-Channel Auscultation." In *IEEE SENSORS*, pp. 1–4, 2023. doi:10.1109/SENSORS56945.2023.10325175.

RESEARCH PROJECTS

Automated Detection & Mechanistic Characterization of Spreading Depolarizations   Sep. 2025 – Present
Research Assistant | Supervised by: Dr. Edilberto Amorim, UCSF
  • Developed a full ECoG processing pipeline (DC/AC decomposition, artifact modeling) and designed automated SD detection algorithms integrating wavefront propagation features and deep scoring models. Applied information-theoretic metrics (entropy, AIS, TE, synergy) to uncover cortical dynamics surrounding SD onset. Leading a future first-author manuscript.

Neural Representation of Speech and Auditory Stimuli in Coma   Nov. 2025 – Present
Research Assistant | Supervised by: Dr. Edilberto Amorim, UCSF
  • Assisted in developing a synchronized ECoG–audio acquisition system with neurosurgery teams to study residual auditory encoding across varying levels of consciousness. Designed stimulus paradigms and prepared analysis pipelines for spectrotemporal feature extraction and cortical encoding models. Data collection is currently ongoing.

Predicting Coma Recovery Using Massive Neurophysiology Datasets [1]   Sep. 2024 – Oct. 2025
Research Assistant | Supervised by: Dr. Edilberto Amorim, UCSF
  • Built temporal deep-learning and clustering frameworks to model hyperexcitability evolution from long-term EEG in >1,000 cardiac arrest patients. Designed multiscale feature engineering pipelines and contributed core analyses and figures to manuscripts under multi-center review and to an NER presentation.

Application of Generative Agents in Simulating Social Crises [2]
Research Assistant | Supervised by: Arkala-Studio   May 2023 – Nov. 2024
  • Proposed a cutting-edge social simulation paradigm powered by llama2's large language model.
  • Created a cognitive thinking framework for the model and implemented multi-thread interaction for simulating a generative society.
  • Achieved a virtual government's response to public administration events in a small town by the integration of quantitative and qualitative approaches.

Acoustic Evaluation and Classification of Swallowing Sounds for EGJOO Diagnosis [3]

Research Assistant | Supervised by: Prof. CHAN Ho Man, CityU   May 2022 – Sep. 2024

- Collaborated with Dr. Marc T. L. Wong from the Department of Medicine and Therapeutics, Prince of Wales Hospital, to initiate a pivotal phase of the project focusing on the collection of swallowing sounds from patients with dysphagia.

- Integrated multi-channel swallowing sounds with high-resolution manometry (HRM) to build a multimodal diagnostic dataset. Developed a CNN ensemble model for classifying swallowing events and detecting EGJOO-related abnormalities.

PROFESSIONAL EXPERIENCE

University of California, San Francisco (UCSF)   Jun 2025 – Present

Assistant Specialist, Dept. of Neurology San Francisco, CA, USA
- Conduct large-scale EEG/fMRI/BCI data analysis for coma recovery research.
- Develop ML pipelines (autoencoder, LSTM) for predictive modeling.
- Contribute to publications and collaborative neurophysiology projects.

Arkala Studio, Own Startup   July 2023 – Sep. 2024

Chief Technology Officer - Hong Kong 300 tech
- Co-founded Arkala Studio, a game company leveraging large language models (LLMs), and successfully secured significant funding, including a HKD 200,000 sponsorship from the City University of Hong Kong's Hong Kong 300 Tech Fund and Hong Kong Science Park, along with a verbal agreement for a US$300,000 deal with ZhenFund.
- Led the AI R&D department in fine-tuning large language models and designing architectural workflows, diverse team of 15 members, contributing significantly to the development of generative agent-based games.

ACADEMIC PROJECTS

NMA 2022 (NMA-CN), Computational Neuroscience   July 2022

Remote Participant
- Participated in the Neuromatch Academy (NMA) educational initiative and focused on learning essential computational techniques.
- Developed a thorough understanding of applying Generalized Linear Models (GLMs) to address a wide range of data analysis questions in neuroscience.
- Explored cost function optimization, overfitting, cross-validation, and regularization techniques, including L1 and L2 regularization, with connections to Bayesian statistics.

SKILLS & LANGUAGES
Technical Skills:

Technical Skills:

- ♦ **Machine Learning & Neural Networks**: Experienced in designing and implementing LSTM, CNN, autoencoders, and contrastive learning models for time series and neurophysiological data analysis.
- ♦ **Neuroimaging Data Processing**: Proficient in handling and analyzing EEG, fMRI, and invasive BCI datasets using advanced machine learning and statistical methods.
- ♦ **Biomedical Signal Analysis**: Skilled in extracting, processing, and integrating multi-channel audio data, high-resolution manometry (HRM), and physiological signals for diagnostic applications.
- ♦ **Programming & Software**: Advanced in Python (TensorFlow, PyTorch), MATLAB, and C++; experienced with Git, Jupyter, and MATLAB Simulink for project development and collaboration.
- ♦ **Data Visualization & Statistical Analysis**: Proficient in using tools like MNE-Python, matplotlib, seaborn, and Pandas for creating detailed visualizations and conducting robust statistical tests.

Programming Languages:
- ♦ Python: Advanced proficiency in Python for machine learning, data analysis, and backend development.
- ♦ C++: Skilled in using C++ for high-performance computing and algorithm development.
- ♦ Java: Experienced in Java for building robust and scalable applications.