XAVIER CHEN

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RESEARCH INTERESTS

Language models and machine self-cognition, inspired by principles from neuroscience. Interested in exploring hierarchical architectures for language models to develop autonomous intelligent agents (decision-making, emotion, memory, learning, and hormonal regulation from neuroscience) and tuning language models to align with the reasoning patterns and behavioral traits of specific individuals.

EDUCATION

University of California, San Diego, La Jolla, United States — Expected Graduation in Jun. 2026

Master of Science in Computer Science

- GPA: 3.93/4.00 for AI, 4.00/4.00 for Neuroscience
- Coursework in AI: Information Theory, Random Process, Machine Learning, Deep Learning
- Coursework in Neuroscience: Systems/Computational/Cognitive Neuroscience, Neurobiology Laboratory

Tongji University, Shanghai, China — Aug. 2018 - Jul. 2023

Bachelor of Engineering in Vehicle Engineering (Automobile), Minor in Artificial Intelligence

- GPA: 4.34/5.00, 88.4%. Equal to 3.84/4.00 in US system

MIT xPRO, Online, Professional Certificate in Data Engineering — Oct. 2023 - Jul. 2024

RESEARCH EXPREIENCE

Cottrell Lab, UC San Diego, La Jolla, CA, US — Feb. 2025 – Jun. 2025

Researcher

Advisor: Prof. Garrison Cottrell, Department of Computer Science & Engineering, UC San Diego

- Research the parallels between feature representations in artificial neural networks and neural activity in brain regions. Specifically, investigate how different neural network architectures impact identity classification accuracy for both upright and inverted face stimuli.
- Designed and implemented an attractor network model with an innovative feedback loop, enabling the storage of 32×32 binary pixel images at a capacity of 400—significantly surpassing the theoretical limit of approximately 150 in a standard Hopfield network.
- Implemented a convolution-based attractor network block that significantly reduced test accuracy on inverted faces to near chance levels, demonstrating a strong ability to constrain representations within the latent space.
- Independently reimplemented the project in a streamlined, maintainable codebase. Significantly accelerates further implementations, ensuring scalability and ability of running across platforms, including local environment, servers and National Research Platform's Kubernetes cluster.

Tongji University, Shanghai, China — Apr. 2023 – Jul. 2023

Research Assistant

Advisor: Prof. He Lianghua, College of Electronic and Information Engineering, Tongji University

- Investigated how effectively EEG signals reflect human cognition by presenting participants with scenic images and corresponding native-language descriptions across four distinct categories.
- Designed and executed a cognitive neuroscience experiment using a 64-channel EEG cap to capture neural responses under varied contextual stimuli.
- Preprocessed EEG data with the MNE-Python library and co-developed EEG-NET, a neural network model for classifying EEG segments associated with different cognitive scenarios.

Technical University of Munich, Munich, Germany Apr.2022 – Sep. 2022

Graduate level researcher

Advisor: Prof. Daniel Renjewski, Department of Mechanical Engineering, Technical University of Munich

- Modeled bipedal robots in MATLAB, processing from mass-spring representations to 6-degree-of-freedom dynamic models.
- Developed and implemented an Untrainable Neural Network for locomotion control, applying Particle Swarm Optimization to enhance walking speed to 1.5 m/s in a stable manner.
- Authored seven technique reports documenting experimental design, model development, and iterative findings, maintaining clear records for reproducibility and team collaboration.

Optimization Design for Express Bus Stops Stations. Mar. 2019 - Sep. 2020

Funded by Student Innovation Training Program, Tongji University

Advisor: Prof. Teng Jing, College of Transporting Engineering, Tongji University

- Proposed and led a project inspired by the discrepancy between scheduled and actual wait times on Dalian City Bus No.505, addressing urban public transportation inefficiencies.
- Designed and distributed questionnaires and conducted field observations, collecting data on stop intervals and passenger boarding and alighting patterns across multiple bus rides.
- Developed and applied a Maximum Likelihood Estimation (MLE) model to analyze collected data and generate optimized bus stop scheduling to reduce passenger wait times.
- The launch of new bus line is expected to save 520 million dollars per year.

LEADERSHIP

Teaching Assistance **La Jolla, CA, US**

Under Department of Cognitive Science Apr. 2025 - Jun. 2025

- Course: DSGN 1 (Design of Everyday Things)
- Practiced English communication skills and helped balance the relationship between students and lecturer.

Team Leader of Chassis Group **Shanghai, China**

Tongji University ZEAL Eco-Power Sep. 2020 - Dec. 2021

- Participated in two chassis projects, designed, machined and assembled the prototype car Z201 and Z202.
- Researched, designed, and manufactured hydrogen fuel system for the first time, completing road tests.

AWARDS

- Won the 3rd Place in the 3rd Shell Eco-marathon China Station (UC Z201) Nov. 2021
- Won the 4th Place in the 3rd Shell Eco-marathon China Station (Prototype Car Z202) Nov. 2021
- Received the Third-Class Scholarship of Outstanding Student at Tongji University 2021
- Received the Third-Class Scholarship of Outstanding Student at Tongji University 2020
- Received the First-Class Scholarship of Outstanding Student at Tongji University 2019

SKILLS

- **Programming Languages**: Python, MATLAB, SQL, Java, C/C++, Assembly, Golang
- **Libraries & Framework**: PyTorch, Numpy, CVXPY, Scikit-learn, Pandas, Carla, MNE
- **Developer Tools**: Anaconda, Github, Docker, Kubernetes
- **Language Skills**: Mandarin (Native), English (IELTS 7.5), German (CEFR C1)