Zihang Xiao

xiaozihang@ucsb.edu - 8055688670

Education

University of California, Santa Barbara, College of Creative Studies

Bachelor of Art in Biology

(Concentration in **System and Computational Neuroscience)**   Expected January 2025

- Selected Coursework: Regression Analysis, Statistical Machine Learning, Signal Analysis and Processing, Computational Neuroscience, System Neuroscience, Deep Learning, Non-Linear Dynamics

Experience

Research Assistant, University of California, Santa Barbara, Sung Soo Kim Lab   September 2021-Present

- Building a connectome-based ring attractor visual ODE network to simulate fruit flies' anterior visual pathway with Pytorch and Brian2
- Developed a low-budget, multicolor closed-loop virtual reality for fruit flies using a wind-powered treadmill, Unity environment, and a flexible screen, and the apparatus is used to create a real-world environment for multiple navigation behavior experiments.
- Created and performed different behavioral experiments combined with transgenic fruit flies to characterize ring neurons' function in the navigation and found a specific behavioral pattern change resulting from silencing ring neurons during fixation behavior with certain visual patterns.

SURF Fellow, California Institute of Technology, Elizabeth J. Hong Lab   June 2023-September 2024

- Designed and executed multiple behavioral experiments quantifying changes in fruit flies' behavior after early-age natural odor exposure
- Developed a custom behavioral apparatus for precise odor delivery and real-time fly position tracking, enabling quantification of odor-encountering behavior
- Wrote R, MATLAB, and Python scripts for data cleaning, analyzing, and characterizing upwind running behavior dynamics and discovered a specific dynamic pattern change after early odor exposure.
- Conducted experiment in vivo two-photon functional calcium imaging experiments in head-fixed behaving flies to investigate early-age natural odor exposure-induced modifications in mushroom body activity.

Research Assistant, Zhejiang University, Xiao Dong Wang Lab   May 2021-September 2021

- Constructed a behavioral paradigm called Y-maze and its two-photon imaging parts to study the lateral entorhinal cortex (LEC) of mice and its relationship with anxiety.
- Analyzed two-photon microscopy data from LEC of the mice and its behavioral data in the Y maze using principal component analysis and support vector machine and discovered a subset of neurons in LEC related to anxiety behavior

Activities

Founder, Quantitative Biology Club @ UCSB   June 2023-Present

- Collaborate with other team members for holding and designing the guest speaker series and journal clubs about recent biological advancement and its quantitative methodology

- Recruiting faculty advisor and raise funding for the club.

Publications

Manuscripts Under Review:

- Dylla, K.V., **Xiao, Z.**, Dong, L.Y., O'Connell, T.F., Hong, E.J. "Early life experience with natural odors modifies olfactory behavior through an associative process." (Under Second Review at ***Current Biology***)

Manuscripts in Preparation:

- Lai, J., Garner, D., **Xiao, Z.**, Hwang, L., Roshkovan, L., Wolff, T., Rubin, G.M., Natesan, D.D., Kim, S.S. "Connectome and functional imaging reveal visual features critical for navigation in *Drosophila melanogaster*." (Manuscript in preparation)

Skills

Python, C++, R, MATLAB, Deep Learning(Pytorch framework), LLM, SQL, HTML/CSS, CAD Design, Soldering, JavaScript
Basic Fruit flies & Mice Skills: stock keeping, crossing,2p dissection, tethering(fly), perfusion(mice), brain slicing(mice)