YIXUAN LI

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EDUCATION

University of Science and Technology of China (USTC) September 2018 - June 2022
B.S. in Physics.
Weighted Grade: 85/100.

University of Science and Technology of China (USTC) September 2022 - present
Graduate Student in Biophysics and Neuroscience.
Weighted Grade: 77/100. Advisor: Prof. Quan Wen

RESEARCH INTERESTS

1. Brain-Machine Interfaces.
2. Flexible Electrodes.
3. Neuroscience Technologies that Directly Benefit Humanity.
4. Utilizing Machine Learning and Deep Learning Tools in Neuroscience.

RESEARCH EXPERIENCE

Graduate Research, Advised by Prof. Quan Wen, At USTC.

Multisensory Integration in *C. elegans* July 2022 - present

- Animals need to integrate multiple sources of information to increase their chances of survival and reproduction.
- We used taxis to investigate the ability of C. elegans to integrate NaCl and temperature information, both essential for its survival.
- Our results show that C. elegans do integrate these two types of information, and reveal the neural circuits responsible for this integration.
- We conducted whole-brain calcium imaging during *C. elegans* taxis.
- We are building a closed-loop control model to depict the active-sensing and proprioception of *C.elegans* during their taxis and multisensory integration.

Auto Worm Behavior Detector May 2023 - July 2024

- Conducted auto detection of behaviors in *C. elegans*.
- Over 90% accuracy rate.
- Unsupervised learning, eliminated the need for human labeling, which has troubled the lab for several years.
- Been adopted for continued use throughout the lab ever since.
- Open source: Codes. Videos.
- Patent application submitted.

Extracting Calcium Traces from *C. elegans* November 2023 - January 2024

- Segmented the soma and the axon/dendrite.

Learning and Memory in Planarians June 2023 - September 2023

- Investigated mechanical stimulation, electric shock, and spatial memory.

***C. elegans* Brain-Machine Interface** December 2022 - August 2023

- This project aimed to use calcium imaging to read whole-brain neural activity and optogenetics and microfluidics to manipulate signals.
- I contributed to the data augmentation for the deep learning models we used.

Offline Tracking of Zebrafish May 2023 - June 2023

- Employed DeepLabCut.

Undergraduate Research, Advised by Prof. Xiaochu Zhang, At USTC.

Finite Element Method Simulations of tDCS, tACS, and TI July 2021 - June 2022

- Discovered a new method to enhance the focality of TI.

Circuit Implementations of tDCS, tACS, and TI January 2021 - June 2021

- Assembled the circuits of tDCS, tACS, and TI according to the diagrams.

PUBLICATIONS

Runhui Li†, Yixuan Li†, Ping Wang, Bingzhen Zhao, Tianqi Xu, Quan Wen‡. "Multisensory Integration in Taxis Behaviors of *Caenorhabditis elegans*." The First Chang Hsiang-Tung Brain Science Symposium, Shanghai, October 26, 2024. Presented by Yixuan Li. **Best Poster Award.**

Yixuan Li, Quan Wen. "Method, Device, and Equipment for Identifying Nematode Behaviors." China Patent Publication Number: CN 118968628 A. Chinese Patent Application Number: CN202411114960.0.

TEACHING FELLOW

Computational Physics Fall 2024

- Conducted monthly sessions to expand on topics covered in the main lectures.
- Reviewed students' homework and provided detailed feedback.

Computational Neuroscience Fall 2022, 2023, 2024

- Taught bi-weekly sessions which supplemented the main lectures with additional topics.
- Corrected the homework and provided detailed explanations.

HONORS AND AWARDS

- 2018-2019, USTC, Outstanding Student Scholarship, Grade C (Top 40%).
- 2020-2021, USTC, Outstanding Student Scholarship, Grade B (Top 20%).
- Fall 2020 and Spring 2021, USTC, Top 10 Among About 500 Students in the 10 km Competition.
- 2022-2025, USTC, First Level Scholarship of College of Future Technology. Total: CNY 60,000.
- 2022-2025, USTC, Graduate Academic Scholarship. Total: CNY 34,800.

SKILLS

- Programming Languages: C/C++, MATLAB, Python, R, Julia, Mathematica.
- Computer Skills: Git, Linux, LaTeX, COMSOL Multiphysics, SimNIBS.
- Experiment Skills: Physical and Electrical Experiments. *C. elegans* Behavior Experiments.
- TOEFL: 101 (28/30/22/21 for Reading/Listening/Speaking/Writing).

HOBBIES

Exercise. Data Mining. Knowledge Sharing.