

# YIXUAN LI

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[bruce-yixuan-li.github.io](https://bruce-yixuan-li.github.io)

## EDUCATION

### University of Science and Technology of China (USTC)

B.S. in Physics.

Weighted Grade: 85/100.

September 2018 - June 2022

### University of Science and Technology of China (USTC)

Graduate Student in Biophysics and Neuroscience.

Weighted Grade: 77/100.

September 2022 - June 2025

Advisor: Prof. Quan Wen

## RESEARCH INTERESTS

1. Brain-Machine Interfaces.
2. Improving Human Health with Neuroscience and Deep Learning.

## RESEARCH EXPERIENCE

### Research Assistant, Advised by Prof. Yuanning Li, At ShanghaiTech.

#### Full Spectrum Speech Decoding for Mandarin Chinese

June 2025 - Now

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

#### Multisensory Integration in *C. elegans*

July 2022 - June 2025

- 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 published (CN 118968628 A).

#### 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 utilize 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

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Runhui Li<sup>†</sup>, Yixuan Li<sup>†</sup>, Ping Wang, Bingzhen Zhao, Tianqi Xu<sup>‡</sup>, Quan Wen<sup>‡</sup>. "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

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### Computational Physics

Fall 2024

- Taught monthly sessions which supplemented the main lectures with additional topics.
- 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.
- Reviewed students' homework and provided detailed feedback.

## HONORS AND AWARDS

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- 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

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- Programming Languages: C/C++, MATLAB, Python, R, Julia, Mathematica.
- Computer Skills: Git, Linux, L<sup>A</sup>T<sub>E</sub>X, 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

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Exercise. Data Mining. Knowledge Sharing.