

# JIAYU (RYAN) ZUO

Sophomore Undergraduate · Engineering  
Intended Major: EE/BME

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 Shenzhen, China  Jiayu Zuo

## SELF-INTRODUCTION

Hi! I'm a sophomore undergraduate student in Engineering at SUSTech, intending to major in EE/BME. Strong interests in neuroscience and BCI, with experience in EEG signal processing, 3D reconstruction, and deep learning.

Currently conducting research at NCC Lab under the supervision of Associate Professor Quanying Liu. For my latest information, please see my personal homepage.

## SKILLS

**Programming:** Python, C, Java, MATLAB,  $\LaTeX$

**Frameworks:** PyTorch, NumPy, MNE

**Tools:** Git, Docker, Jupyter

**Languages:** Chinese (Native), English (Fluent, CET-4)

## RESEARCH PROJECTS (LEADING)

- 11/2025 – Present **Resolving the Semantic-Fidelity Trade-off in EEG Visual Decoding** NCC Lab, SUSTech
- Addressed the "semantic bottleneck" of traditional EEG-to-CLIP alignment, where low-dimensional features lose vital pixel-level data.
  - Developed a novel multi-stage self-distillation framework to inject high-fidelity reconstructive properties into the ATM encoder.
- High-Dimensional Embedding / Self-Distillation / EEG Decoding
- 09/2025 – Present **Foundation Model-Aligned Chinese Semantic Decoding from Brain Signals** NCC Lab, SUSTech
- Investigating brain-to-text decoding methods for Chinese language using foundation model alignment
  - Working on EEG2Text pipeline to decode semantic representations from neural activity
  - Funded by the University Scholars Innovation Technology Fund (Climb Program) of Guangdong Province
- EEG2Text / Foundation Models
- 09/2024 – 09/2025 **Multi-View 3D Reconstruction System for EEG Electrode Localization** NCC Lab, SUSTech
- Developed a precise electrode positioning system using multi-view 3D reconstruction techniques
  - Implemented source localization algorithms and VGGT for visual reconstruction
  - Applied YOLO-based object detection for automated electrode identification
  - Filed one patent application (under review)
- 3D Gaussian Splatting / YOLO / Source Localization

## EDUCATION

- 08/2024 - 06/2028 **Bachelor of Engineering** Southern University of Science and Technology (SUSTech)  
Intended Major: EE/BME  
**Completed:** Calculus, Linear Algebra, College Physics, Fundamentals of Electronic Circuits  
**In Progress:** Data Structures and Algorithms, Probability & Statistics, Signals and Systems

## PUBLICATIONS & UNDER REVIEW

- BrainWhisperer: Learning Aligned Semantic Representations from Brain Activity for Language Model-based Decoding** Under Review (ICLR2026)  
D. Li, D. Liu, S. Chen, J. Zuo, K. Xie, Y. Liu, C. Wei, & Q. Liu
- Research on the Dynamic Evolution Mechanism of Brand Competition Relationship Networks Based on Stochastic Actor-Oriented Model** ICEB 2025  
M. Zuo, H. Lai, Z. Liang, J. Zuo

## HONORS & AWARDS

- 12/2025 **Guangdong Province "Climb Program" Special Funds (University-level Project)** SUSTech
- Project: *Foundation Model-Aligned Chinese Semantic Decoding from Brain Signals*.
  - Selected as a top-tier undergraduate project (Top 30%) with a grant of **CN¥20,000**.
- 11/2025 **Award of Excellence (Poster Presentation)** Department of Biomedical Engineering, SUSTech
- Title: *MindPilot: EEG-guided Brain Modulation using Closed-loop Visual Stimulation Optimization*.
  - Awarded at the 6th SUSTech BME Research Day.

## COMPETITIONS

12/2025	<b>Winning Prize, 2025(6th) "Greater Bay Area Cup" Financial Mathematical Modeling Contest</b>	<b>GDSTA</b>
	<ul style="list-style-type: none"> <li>• <b>Team Leader.</b> Topic: <i>"Comprehensive Evaluation and Development Analysis of Stablecoins"</i>.</li> <li>• GDSTA: Guangdong Association for Science and Technology</li> <li>• Hosted by Guangdong Society for Industrial and Applied Mathematics &amp; Guangdong-Hong Kong-Macau Center for Applied Mathematics(Sun Yat-sen University).</li> </ul>	
05/2025	<b>Honorable Mention (H Award), 2025 Mathematical Contest in Modeling (MCM)</b>	<b>COMAP</b>
	<ul style="list-style-type: none"> <li>• <b>Solo Participant.</b> Topic: <i>"Cybersecurity Analysis Based on the Global Cybersecurity Index (GCI)"</i>.</li> </ul>	
07/2023	<b>National Second Prize, (3th) China High School Mathematical Contest in Modeling</b>	<b>Beijing Normal University</b>
	<ul style="list-style-type: none"> <li>• <b>Solo Participant.</b> Topic: <i>"Game Theoretic Analysis of Medical Resource Runs During the COVID-19 Pandemic"</i>.</li> </ul>	

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## RESEARCH EXPERIENCE

### Neural Computing and Control Lab (NCC Lab)

09/2024 – Present

Undergraduate Researcher focusing on BCI, CHI, and NeuroAI.

*Department of Biomedical Engineering, SUSTech  
Supervisor: Associate Professor Quanying Liu*

#### Multimodal Neural Encoding & Decoding:

- **Visual:** *High-Fidelity EEG Visual Decoding (EEG-to-Image) & Visual Encoding (Image-to-EEG)*
- **Auditory & Language Processing:** *Foundation Model-Aligned Chinese Semantic Decoding*
- **Multimodal Decoding:** *Generalizable Brain-to-Concept Translation via Adaptive Multimodal Routing*

#### Cross-Modal BCI Systems & Intelligent Control:

- **Computer Vision:** *Multi-View 3D Reconstruction System for EEG Electrode Localization*

#### Neural Modulation for Emotion & Cognition:

- **Real-Time System:** *EEG-Guided Brain Modulation using Closed-loop Visual Stimulation Optimization*

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## SOCIAL SERVICES

SUSTech Red Cross Youth Chapter:

Certified Junior First Aider; the chapter was recognized as a National Red Cross Model Unit by the Red Cross Society of China (2025).

Mental Health First Aid (MHFA) Standard Course:

Certificate of Completion issued by The Mental Health Association of Hong Kong (authorized by MHFA International).

Excellent Dormitory Manager of SUSTech, Zhicheng College.