# Jizhou Guo

Homepage • sjtu18640985163@sjtu.edu.cn • LinkedIn • Google Scholar • Github

Research Interests: Large Language Models, AI for Science.

## Education

**Shanghai Jiao Tong University** • Shanghai, China — Aug 2022 – Present
*Bachelor of Science* • Zhiyuan College (**Honor, Top 10%**) • Mathematics and Applied Mathematics • GPA: 3.8
**Relevant Coursework:** Introduction to Computer Science, Foundations of Data Science, Selected Topics in Scientific Computing, Numerical Analysis and Scientific Computing, Probability, Stochastic Process, Real Analysis, Ordinary Differential Equations, Partial Differential Equations, Differential Geometry, Topic Course (Applied Mathematics & Deep Learning).

## Publications

** denotes equal contribution*

**Model-Based Differentially Private Knowledge Transfer for Large Language Models**
Zhaomin Wu*, **Jizhou Guo***, Junyi Hou, Bingsheng He, Lixin Fan, Qiang Yang
*Under review* [arXiv]

**Calibrating Reasoning in Language Models with Internal Consistency**
Zhihui Xie, **Jizhou Guo**, Tong Yu, Shuai Li
*NeurIPS 2024* [arXiv]

**Olfactory-EEG Paradigm: Emotion Elicitation and Cross-Stimulus Transfer Learning Analysis**
Jiaqi Wang, Zhengting Chen, Yifan Wu, Keyan Huang, Dian Zhang, **Jizhou Guo**, Xinglan Liu, Dan Peng, Weilong Zheng, Baoliang Lu
*Under review*

## Research Experience

**Xtra Group - National University of Singapore** — Jun 2024 – Oct 2024
Advisor: Prof. Bingsheng He

- Proposed **Llamdex**, a novel framework that integrates privacy-preserving, domain-specific models into LLMs.
- Demonstrated significant performance gains in domain-specific tasks, **with up to 26% accuracy improvement** while maintaining differential privacy guarantees.
- Achieved comparable inference efficiency to base LLMs while enhancing domain-specific capabilities.

**John Hopcroft Center for Computer Science - Shanghai Jiao Tong University** — Oct 2023 – May 2024
Advisor: Prof. Shuai Li and Dr. Tong Yu

- Developed a novel "**internal consistency**" approach to calibrate reasoning in LLMs, **resulting in a significant boost in reasoning performance** without requiring additional training.
- Conducted in-depth analysis of Chain-of-Thought (CoT) reasoning in LLMs through the lens of internal representations.

**Zhiyuan Innovative Research Center - Shanghai Jiao Tong University** — Dec 2022 - Jan 2024
Advisor: Prof. Bao-Liang Lu and Prof. Wei-Long Zheng

- Designed and executed experiments to predict human emotions from EEG signals under various olfactory stimuli.
- Implemented and compared multiple deep learning models (MLP, CNN, Transformer) with Domain-Adversarial Neural Networks (DANN).

**Quantitative Biology Summer School - Center for Life Sciences, Peking University** — Jul 2023

- Completed advanced courses in Systems Biology, Computational Neuroscience, and Bioinformatics, earning relevant certifications.
- Conceptualized and simulated a novel bio-responsive bandage using MATLAB, modeling drug diffusion processes for optimized wound healing.

**Tencent Spark Project - Tencent Corporation** — Aug 2022

- Engineered a robust palm liveness detection system.
- Successfully blocking palm images displayed on screens and improving overall system reliability.

## Course Projects

**Two-Area RNN: Representations for Context-Dependent Decisions** — Fall 2024
Team leader, advised by Prof. Douglas Zhou

- Presented the Two-Area Recurrent Neural Network (2aRNN) model, which extends the understanding of context-dependent decision-making processes by simulating the neural dynamics.

**Deep Reinforcement Learning: Insights from AlphaGo** — Spring 2024
Team leader, advised by Prof. Dan Hu (**Scored 100**)

- Demonstrated the core mechanisms of AlphaGo, corresponding deep reinforcement learning approaches, and related theoretical frameworks.

**Frequency principle in deep learning** Autumn 2023
Individual project, advised by Prof. Zhi-Qin John Xu (**Achieved the top score**)

- Observed frequency principle: deep neural networks often fit target functions from low to high frequencies.
- Conducted experiment on frequency principle when fitting different functions or using different hyperparameters.

**Fresnel Integral & Van der Waals equation** Spring 2023
Team project, advised by Prof. Zhenli Xu

- Tested and compared the performance of various methods when calculating Fresnel Integral.
- Compared the performance of Newton's method and fixed point iteration method when solving Van der Waals equation.

## SELECTED AWARDS

*Click here to view all certificates*

### Contest Prizes

- **Gold Award** and **First Runner-up** in the National College Students' Career Planning Contest (Shanghai Region)
- Third Prize in Mathematics competition of Chinese College Students (Shanghai), Dec 2023
- **First Prize** in Shanghai Collegiate Programming Contest, Sep 2023 (Ranked 2nd in Shanghai)
- **Gold Medal** in Astar Programming Contest (Shanghai region), Aug 2023 (Ranked 2nd in Shanghai)
- **Gold Medal** in 2023 China Collegiate Programming Contest (**CCPC**) National Invitational Contest (Hunan), May 2023
- **Gold Medal** in 2023 International Collegiate Programming Contest (**ICPC**) Xi'an Invitational Contest, May 2023
- **Gold Medal** in 2022 International Collegiate Programming Contest (**ICPC**) Asia Hangzhou Regional Contest, Dec 2022 (Ranked 8th nationwide)
- **Gold Medal** in 2022 China Collegiate Programming Contest (**CCPC**) (Shanghai region), Sep 2022
- **Silver Medal** in National Olympiad in Informatics (**NOI**), Jul 2021
- **Ranked 22nd nationwide** in National Olympiad in Informatics (**NOI**) Online Senior Group, Mar 2021

### Honors

- Zhiyuan **First-Class** Overseas Research Scholarship
- Merit Student of SJTU
- Second-Class Academic Scholarship, SJTU (Top 10%, ranked 2nd overall)
- Zhiyuan Honors Scholarship (three times)

## Skills

- Programming languages: Python, C/C++, Matlab, GNU Bash, LaTeX.
- Language: Chinese (Native Speaker), English (Proficient, TOEFL 105, CET6 648).
- Expertise & Hobbies: Piano (Amateur Level 10), Singing (Amateur Level 9), Music Theory (Amateur Level 5).