Jizhou Guo

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Research Interests: Large Language Models and Foundation Models.

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: Data Structure (Honor), Introduction to Computer Science, Foundations of Data Science, Mathematical Statistics, Numerical Methods for ODE & PDEs, Selected Topics in Scientific Computing, Numerical Analysis and Scientific Computing, Probability, Stochastic Process, Real Analysis, Mathematical Analysis (Honor), Advanced Algebra (Honor), Differential Geometry, Topic Course (Applied Mathematics & Deep Learning), Independent Research.

Publications

** denotes equal contribution*

Reward Inside the Model: A Lightweight Hidden-State Reward Model for LLM's Best-of-N sampling
Jizhou Guo, Zhaomin Wu, Philip S. Yu
Under review [arXiv]

- Proposed *ELHSR*, a highly parameter-efficient reward model leveraging the LLM hidden states, which **systematically outperforms baselines** with **less than 0.005% of the parameters** of baselines, resulting in orders-of-magnitude efficiency improvement. It also performs well with limited data and extends to logit-only training.
- I was solely responsible for the ideation, experimental validation, and writing of the manuscript.

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

- 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 privacy guarantees, with efficiency comparable to base LLM.
- I designed the core modules (encoder and mapping module), conducted extensive experimentation, and contributed to manuscript writing.

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

- Developed a novel "*internal consistency*" approach to calibrate reasoning in LLMs, resulting in a significant boost in reasoning performance **without requiring additional training**.
- I assisted with experimentation, including conducting in-depth analysis of Chain-of-Thought (CoT) reasoning in LLMs through the lens of internal representations, and actively participated in the submission rebuttal process.

Cross-Stimulus Transfer Learning: Enhancing Emotion Recognition from Visual-Auditory to Olfactory Perception
Jiaqi Wang*, Zhengting Chen*, Keyan Huang, Yifan Wu, Dian Zhang, **Jizhou Guo**, Xinglan Liu, Dan Peng, Baoliang Lu, Weilong Zheng
EMBC 2025 (Full Contributed paper)

- Implemented a Transformer-based Domain-Adversarial Neural Network (DANN) to transfer knowledge from visual to olfactory EEG data for emotion classification.
- I assisted with the execution of experiments.

EEG-based Emotion Recognition in an Olfactory Stimulation Paradigm
Jiaqi Wang*, Zhengting Chen*, Keyan Huang, Yifan Wu, Dian Zhang, **Jizhou Guo**, Xinglan Liu, Dan Peng, Baoliang Lu, Weilong Zheng
EMBC 2025 (Research posters abstract) *In submission to main conference*

- Collected data and applied machine learning techniques to predict human emotions from EEG signals in response to various olfactory stimuli.
- I assisted in preparing experiment materials and participated in EEG signal collection experiments.

Research Experience

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

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

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

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

- Chosen from 50 candidates nationwide.

Tencent Spark Project - Tencent Corporation Aug 2022

- Chosen from 50 high-school students with talents nationwide.
- Engineered a robust palm liveness detection system and successfully blocking palm images displayed on screens and improving overall system reliability.

Selected Course Projects

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

- 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**)

- Validated the frequency principle: deep neural networks often fit target functions from low to high frequencies.

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), Jan 2025
- 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)

Services

Invited as reviewer: EMBC 2025

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).