Zheyuan Zhang

zheyuan-22@mails.tsinghua.edu.cn Google Scholar Homepage

Education

Ph.D. Student. School of Computer Science, Carnegie Mellon University. **2025.8 - now**
Language Technology Institute. WInE Group. Advised by Prof. Sherry Tongshuang Wu.

Master Student. Computer Science and Technology. Tsinghua University **2022.9 - 2025.6**
Knowledge Engineering Group. Advised by Prof. Juanzi Li. *3.95/4 GPA (Top 10%)*

Bachelor Student. Xinya College. Tsinghua University **2018.9 - 2022.6**
Bachelor of Law. Major in Philosophy, Politics, and Economy (PPE). Minor in Psychology. *3.76/4 GPA (Top 10%)*

Research

My research interests are twofold:

Understanding and Improving Language Models from Human Perspective

Employing empirical methods and cognitive psychology approaches, I aim to: (1) Understand the capabilities and mechanisms of language models; (2) Examine the alignment of language models with human cognitive structures; (3) Investigate the potential applications of language models in mimicking human cognitive processes; and (4) Explore the effects of language models on human cognition and social behavior.

- **Zhang, Z.***, Yu, J.*, Li, J., Hou, L. (2023). Exploring the Cognitive Knowledge Structure of Large Language Models: An Educational Diagnostic Assessment Approach. Findings of EMNLP 2023.
- **Zhang, Z.**, Li, R., Kabir, T., Boyd-Graber J. (2024). NAVIG: Natural Language-guided Analysis with Vision Language Models for Image Geo-localization. In submission to ACL 2025.
- Sabour, S., Liu, S., **Zhang, Z.**, Liu, J. M., Zhou, J., Sunaryo, A. S., ... Huang, M. (2024). EmoBench: Evaluating the Emotional Intelligence of Large Language Models. ACL 2024.
- Zhang-Li, D., Lin, N., Yu, J., **Zhang, Z.**, Yao, Z., Zhang, X., ... Li, J. (2024). Reverse That Number! Decoding Order Matters in Arithmetic Learning. arXiv preprint arXiv:2403.05845.

Building User-centric AI Applications

Leveraging state-of-the-art AI technologies, I design innovative applications and interaction paradigms for human benefit. For example, I work on challenges posed by AI in the educational domain, build AI systems to enhance learning experiences, and explore how the advanced technologies affect learning behaviors and cognitive processes. Recently, I'm investigating on designing multi-agent systems for adaptive learning.

- **Zhang, Z.***, Zhang-Li, D.*, Yu, J., Gong, L., Zhou, J., Liu, Z., Hou, L., Li, J. (2024). Simulating Classroom Education with LLM-Empowered Agents. NAACL 2025.
- Tu, S.*, **Zhang, Z**.*, Yu, J., Li, C., ... Li, J. (2023). LittleMu: Deploying an Online Virtual Teaching Assistant via Heterogeneous Sources Integration and Chain of Teach Prompts. CIKM 2023.
- Zhang-Li, D.*, **Zhang, Z.***, Yu, J., Yin, J. L. J., Tu, S., ... Li, J. (2024). Awaking the Slides: A Tuning-free and Knowledge-regulated AI Tutoring System via Language Model Coordination. KDD 2025.
- Yu, J., **Zhang, Z.**, Zhang-Li, D., Tu, S., Hao, Z., Li, R. M., ... Sun, M. (2024). From MOOC to MAIC: Reshaping Online Teaching and Learning through LLM-driven Agents. arXiv preprint arXiv:2409.03512.
- Zhong, Q., Yu, J., **Zhang, Z.**, Mao, Y., Wang, Y., Lin, Y., ... Tang, J. (2022). Towards a General Pre-training Framework for Adaptive Learning in MOOCs. arXiv preprint arXiv:2208.04708.

* indicates equal contribution. Only the papers with which I'm deeply engaged are listed here. For a full list, please check my Google Scholar.

Professional Services:

Conference Reviewer: CIKM 2024, ACL/NAACL/EMNLP 2024/2025 (ARR), AAAI 2025 KnowFM Workshop, KDD 2025/2026

Journal Reviewer: npj Science of Learning.

Projects

LittleMu: a Virtual Teaching Assistant on Chinese MOOC platform.

- LittleMu is a Virtual Teaching Assistant that instantly helps students with their learning and provides emotional support. LittleMu is deployed on xuetangx.com, **one of the largest MOOC platform** in China. By 2023, LittleMu has served **more than 80,000 users** with over 300,000 queries from over 500 courses.
- We trained a classifier to enable LittleMu to return the most appropriate responses with RAG. For instance, for knowledge-based questions, we utilize knowledge graphs to find the corresponding knowledge; for chit-chat, we leverage the capabilities of LLMs. We also made preliminary attempts to enhance the reasoning abilities of LLMs.
- We conduct experiments with LittleMu and this work was published in **CIKM 2023** (co-first author).

MAIC: Massive AI-powered Courses platform in Tsinghua University.

- We built a AI-powered Course platform called MAIC, where we simulate classrooms for student learners: the teachers and classmates are all LLM agents, and **the lessons are automatically conducted** where students can interrupt anytime.
- 5 courses have been deployed on MAIC, involving over **1,000 students** across on-campus, off-campus, university, and high school settings. Experimental results show that the classmate agents in the system can help enhance students' sense of **social and cognitive presence**. Students interact more with the system have better learning outcomes.
- Relevant works are submitted to ACL 2025 (first author), and accepted at **KDD 2025** (co-first author).

Honors and Awards

Outstanding Master's Thesis **2025**
Title: Intelligent Classrooms based on Large Language Model Agents

Outstanding Master's Graduates **2025**
Outstanding Graduates of Beijing, Outstanding Graduates of DCST

Siebel Scholar **2024**
Siebel Scholar Class 2025, Top 5 in Tsinghua University for outstanding academic performance and leadership

Huiyan Talent Comprehensive Scholarship **2024**
Comprehensive Scholarship for Graduate Students

Outstanding Graduates **2022**
Outstanding Graduates of Tsinghua University, Outstanding Graduates of Beijing

Toyota Scholarship of Tsinghua University **2021**
One of the best Comprehensive Scholarships

Excellent Comprehensive Scholarship of Tsinghua University **2019, 2020, 2021**
Comprehensive Scholarship

Excellent Scholarship of Tsinghua University **2019, 2020, 2021**
Academic (2019, 2020, 2021); Social Work (2020); Sports (2019, 2020, 2021)

Experiences

CLIP Lab, University of Maryland **2024.6 - 2024.11**
Research Intern. Advised by Prof. Jordan Boyd-Graber

Foundation Model Research Center, Tsinghua University **2024.3 - 2025.6**
Research Intern. Advised by Prof. Zhiyuan Liu

THUNLP, Tsinghua University **2024.3 - 2025.6**
Research Intern. Advised by Prof. Zhiyuan Liu

THUKEG, Tsinghua University **2021.9 - 2022.6**
Research Intern. Advised by Prof. Juanzi Li

Hobbies/Miscellaneous

- **Competitive Sports**: I enjoy playing baseball (former member of the Tsinghua University baseball team), basketball (member of CST basketball team), and other competitive sports.
- **Athletics**: I achieved 1st place in the Standing Broad Jump and 3rd place in both the Long Jump and High Jump at the Tsinghua University Track and Field Meet, where I currently **hold the record** for the Standing Broad Jump.
- **Reading**: I have a profound passion for reading. My areas of interest are quite broad, but I have a particular fondness for reading and reflecting on modern social theories. I used to served as an editor of "Society of Sociology", one of China's most influential social media platforms dedicated to sociology, and earned my Bachelor of Laws degree through my research on Thomas Hobbes.