Zijie Zhou

CONTACT INFORMATION

College of Artificial Intelligence
China University of Petroleum (Beijing)

Voice: (+86) 188 0102 9366
E-mail: zjzhouzh@gmail.com
Homepage: https://zijiezho.github.io

RESEARCH INTERESTS

My research focuses on Efficient and Trustworthy Multimodal Agents. I develop Retrieval-Augmented Generation (RAG) frameworks enhanced by Graph Structures and Multi-Agent Collaboration to solve complex reasoning tasks. A key aspect of my work is optimizing these systems using Reinforcement Learning and Dynamic Pruning to balance performance with computational cost.

EDUCATION

China University of Petroleum (Beijing) — Beijing, China

Master of Engineering in Artificial Intelligence (expected) — *Aug. 2023 - Jun. 2026*
- GPA: 3.82 / 4.00 | Rank: 3 / 31

China University of Petroleum (Beijing) — Beijing, China

Bachelor of Engineering in Artificial Intelligence — *Aug. 2019 - Jun. 2023*
- GPA: 3.45 / 4.00 | Rank: 5 / 33

PUBLICATIONS

Zijie Zhou, Dandan Zhu, Heng Zhang, Yanming Yang, Xu Liu, Huisheng Jiao. *Formalizing Heterogeneous Interaction Modeling for Multi-Agent Debate in Visual Geo-Localization.* Under Review, ICME 2026.

Zijie Zhou, Dandan Zhu, Hangxiangpan Wang, Heng Zhang, Huishen Jiao, Yi Zhao. *Hyperbolic and Evidence-Prioritized Experts for Large Vision-Language Models.* Under Review, ICMR 2026.

Jianyu Wang*, **Zijie Zhou***, Wenjie Shao, Xi Xiao, Duoxun Tang, Qing Li. *From Capability to Efficiency: Learning to Orchestrate LLM Routing via Progressive Reinforcement Learning.* Under Review, ICML 2026.

Haoyu Kang*, Xiaotian Lin*, **Zijie Zhou***, Yuyu Luo. *Roads: Towards Data-Efficient Reinforcement Learning with Rollout-free Online Adaptive Data Selection.* Under Review, ICML 2026.

Zhisheng Chen*, Tingyu Wu*, **Zijie Zhou***, Zhengwei Xie, Ziyan Weng, Yingwei Zhang. *PolarMem: A Training-Free Polarized Latent Graph Memory for Verifiable Multimodal Agents.* Preprint (under review). [Paper]

Taolin Zhang, **Zijie Zhou**, Jiuheng Wan, Xiaofeng He, Chengyu Wang, Richang Hong. *MetaEvo: Meta-Evolution of Agent Collaboration Graphs for Multi-Domain Language Understanding.* Under Review, ACL 2026.

Weizi Shao, Taolin Zhang, **Zijie Zhou**, Chen Chen, Chengyu Wang, Xiaofeng He. *M^3Prune: Hierarchical Communication Graph Pruning for Efficient Multi-Modal Multi-Agent Retrieval-Augmented Generation.* Preprint (under review). [Paper].

Yuqi Li, **Zijie Zhou**, Zhiyuan Peng, Junhao Dong, Haochen You, Renye Yan, Shiping Wen, Yingli Tian, Tingwen Huang. *A Preference-Driven Methodology for Efficient Code Generation.* IEEE Transactions on Artificial Intelligence, 2025. [Paper]

ACADEMIC EXPERIENCE

University of the Chinese Academy of Sciences — Beijing, China

Research on Verifiable Multimodal Agents via Polarized Graph Memory — *Sep. 2025 - Jan. 2026*
- Designed a training-free polarized latent graph memory architecture, to address the critical issue of hallucination and the inability to process negative constraints in VLMs.
- Designed a novel logic-dominant retrieval paradigm with orthogonal inhibitory connections, transforming fuzzy perceptual likelihoods into discrete logical constraints to ensure verifiable

reasoning.
- Validated the framework across 8 frozen VLMs and 6 benchmarks, demonstrating superior robustness in reasoning tasks and co-authored a paper currently under review for ICML 2026.

Tsinghua Shenzhen International Graduate School Shenzhen, China

EvoRouter: Hierarchical LLM Routing via Reinforcement Learning *Apr. 2025 - Step. 2025*

- Development of EvoRouter, a reinforcement learning-based framework for dynamic multi-turn LLM routing, solving the inherent multi-objective trade-offs between performance, latency, and token cost.
- Implemented a multi-stage training pipeline featuring a novel exploration reward mechanism, progressively optimizing the agent from capability discovery to user preference alignment.
- Achieved state-of-the-art performance on 15 complex reasoning benchmarks, significantly outperforming strong baselines while preserving generalization to unseen models.

Peking University Beijing, China

Efficient Code Generation via Reinforcement Learning *Dec. 2024 - Mar. 2025*

- Developed a dynamic clipping strategy that adaptively adjusts policy updates based on generation probability and advantage, solving the premature convergence problem in online reinforcement learning.
- Constructed a composite reward modeling system that integrates sparse signals (compilation) with dense signals (efficiency), transforming code generation into a preference-aware optimization process.
- Validated the framework on 1.5B-parameter code models, demonstrating consistent efficiency gains across diverse benchmarks and securing acceptance in IEEE Transactions on Artificial Intelligence.

Working Experience

Innovation Business Center of Yidu Cloud Beijing, China

Algorithm Intern *Feb. 2023 - Aug. 2023*

Developed GRU-based multi-label models for disease prediction with competitive Top-10 performance; cleaned and linked internal medical records via SQL and Pandas to enable effective downstream business analysis.

PERCENT Technology, International Business Department Beijing, China

Machine Learning Research Assistant *Aug. 2022 - Feb. 2023*

Improved Chinese-to-English machine translation by 2%, delivering the deployed model; additionally led multilingual data standardization and contributed to sentiment classification system design.

Teaching Experience

Principle of artificial intelligence *Sep. 2024 - Nov. 2024*

Teaching Assistant, B.Sc AI course in CUPB Beijing, China

Python for data analysis *Apr. 2024 - Jun. 2024*

Teaching Assistant, B.Sc course in CUPB Beijing, China

Honors and Awards

Graduate Study Scholarship, 2023

Undergraduate Study Scholarship, 2022

Technology Innovation Advanced Individual Award, 2022 and 2023

Honorable Mention, Interdisciplinary Contest In Modeling, 2021

Outstanding Undergraduate Student Cadre, 2020

Languages and Skills

- Languages: Mandarin (Native), English (Fluent), French (Beginner)
- Technical Skills: Deployment and fine-tuning of LLMs, Python, PyTorch, RLHF
- Tools: Git, Docker, LangChain, VREL, ChatGPT, Microsoft Office, LaTeX.