Zhiheng Zhang (章智恒)

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Education

University of Chinese Academy of Sciences 2024.9～Present
- ***M.S.*** in Pattern Recognition and Intelligent Systems
- **GPA:** 3.90/4.00

Hunan Normal University 2020.9～2024.6
- ***B.E*** in Artificial Intelligence (Major)
- ***B.Econ*** in Economics (Minor)
- **GPA:** 4.52/5.00 (**rank:** 1/85)

Main Publications

1. Hetero-Designer: Automated Design of Multi-Agent Systems with Heterogeneous LLMs
First Author Accept by **Annual Meeting of Association for Computational Linguistics 2026 (ACL, CCF-A)**
- Overview: We study the automated design of ***heterogenous large language model-based multi-agent systems*** and propose Hetero-Designer. The model employs a ***Binary Transformer*** to encode the intricate relationships among the query, agent roles, and LLMs. Building upon this representation, it adopts an ***autoregressive graph generation*** paradigm to generate the interaction topology of the multi-agent system. Furthermore, ***reinforcement learning*** is introduced to optimize the generated topologies, enabling the construction of ***cost-efficient and high-performing*** multi-agent systems.

2. Beware of the Woozle Effect: Exploring and Mitigating Hallucination Propagation in Multi-Agent Debate
First Author Accept by **IEEE Transactions on Audio, Speech and Language Processing 2026 (TASLP, CCF-B)**
- Overview: We investigate ***what causes the instability of multi-agent debate*** architectures, and identify ***hallucination propagation*** as a key contributing factor. We provide a detailed analysis of the characteristics and underlying mechanisms of hallucination propagation. To mitigate this issue, we propose DIGRA, which introduces a process-aware ***dynamic topology based on Information Gain Ratio***. Specifically, DIGRA dynamically selects communication partners for each agent according to the collaboration process, ***favoring those with higher utility and lower hallucination risk***, thereby effectively blocking the propagation of hallucinations.

3. Improving Continual Few-shot Relation Extraction through Relational Knowledge Distillation and Prototype Augmentation
First Author Accept by **International Conference on Computational Linguistics 2024 (COLING, CCF-B)**
- Overview: We study the ***Continual Few-shot Relation Extraction*** task, which faces challenges of ***catastrophic forgetting and overfitting***. To address these issues, we propose a RK2DA framework that leverages ***relation knowledge distillation*** to transfer structured information from the embedding space of previous tasks, thereby mitigating forgetting. In addition, we introduce a ***prototype-based data augmentation*** strategy to enhance task prototypes, improving generalization and alleviating overfitting.

Projects

National Natural Science Foundation of China 2025 – 2028
- Research on Key Technologies of Event Modeling and Sentiment Analysis for Social Media (U24A20335)

National Natural Science Foundation of China 2023 – 2026
- Research on Key Technologies for Entity Semantic Relation Extraction in Real-World Application Scenarios (62276095)

Awards

- National Scholarship — Ministry of Education, China — 2022-2023
- National Encouragement Scholarship — Ministry of Education, China — 2021-2022
- First Prize, Contemporary Undergraduate Mathematical Contest in Modeling — China Society for Industrial and Applied Mathematics — 2022
- Special Grand Scholarship — Hunan Normal University — 2022-2023
- Provincial Outstanding Graduate — The Department of Education of Hunan Province — 2024