

Zhengliang Shi

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EDUCATION

Shandong University | Bachelor of Computer Science and Technology *Sep 2019 - Jun 2023*

- GPA: 93.46 / 100, Rank: 2 / 182
- Core Modules: Machine Learning (99), Operating Systems (98), Advanced Mathematics (98), Advanced Design and Analysis of Algorithms (98), Discrete Mathematics (100)

RESEARCH INTERESTS

Tool learning with foundation model (e.g., LLM-based agent), Retrieval-Augmented Generation

PUBLICATIONS (SELECTED, * equal contribution)

- [1] Generate-then-Ground in Retrieval-Augmented Generation for Multi-hop Question Answering, (Zhengliang Shi, Shuo Zhang, Weiwei Sun, Shen Gao, Pengjie Ren, Zhumin Chen, Zhaochun Ren. Accepted by *ACL* 2024)
- [2] Confucius: Iterative Tool Learning from Introspection Feedback by Easy-to-Difficult Curriculum, (Shen Gao*, Zhengliang Shi*, Minghang Zhu, Bowen Fang, Xin Xin, Pengjie Ren, Zhumin Chen, Jun Ma. Accepted by *AAAI* 2024)
- [3] Towards a Unified Framework for Scientific Reference Retrieval and Related Work Generation. (Zhengliang Shi, Shen Gao, Xiuying Chen, Zhen Zhang, Pengjie Ren, Zhumin Chen, Zhaochun Ren. Accepted by *EMNLP* 2023)
- [4] Reference-Assisted Dialogue Evaluation for Open-Domain Dialogue. (Zhengliang Shi, Weiwei Sun, Shuo Zhang, Pengjie Ren, Zhumin Chen, Zhaochun Ren. Accepted by *ACL* 2023)

RESEARCH EXPERIENCE (SELECTED)

Large Language Model is an Automatic Multi-tool Learner *Mar 2024- June 2024*
Intern | Baidu. Advisor: Zhaochun Ren (Leiden Uni.), Lingyong Yan, Yue Feng

- Enable the LLM to act as a multi-tool user, which directly utilizes a chain of tools through programming
- Further empower the LLM as a tool learner that can actively discover and document tool usages

Generate-then-Ground for RAG in Multi-hop QA. *Nov 2023- Feb 2024*
Master | Shandong University Advisor: Zhaochun Ren (Leiden Uni.), Shuo Zhang

- Propose a generate-then-ground framework for multi-hop QA task, synergizing the parametric knowledge of LLMs and external documents to solve a multi-hop question.
- Propose an instructional grounding distillation method to generalize our method into smaller models.

Iterative Tool Learning with Foundation Models *Mar 2023 - Aug 2023*
Research Assistant | IRLab, Shandong University Advisor: Zhaochun Ren (Leiden Uni.)

- Propose the *Confucius*, a tool-learning framework, that enhances the large language model (LLM) with external tools to access diverse knowledge sources, including two main phases:
- Conduct extensive experiments on both controlled and real-world settings to demonstrate the superiority of our tool learning framework

- Release the tool-learning dataset to facilitate further research

Towards a More Reliable Evaluation for Open-Domain Dialogue

Jul 2022 - May 2023

Research Assistant | IRLab, Shandong University

Advisor: Prof. Zhaochun Ren (Leiden Uni.)

- Cooperate with Dr. Zhuo Shang (researcher in *Bloomberg*) and introduce the **Reference-Assisted Dialogue Evaluation (RADE)** method to build a trustworthy evaluation method for the open-domain dialogue system
- Extend three existing dialogue datasets with additional rated responses other than just a golden response by human annotation to support RADE
- Verify the effectiveness of our method on five benchmarks, where the Spearman, Pearson, and Kendall correlations with human evaluation outperform state-of-the-art baselines

Reduce the Hallucination of Language Models in Dialogue System

Research Assistant | IRLab, Shandong University.

Sep 2021 - Aug 2022

Advisor: Prof. Zhaochun Ren (Leiden University), Prof. Maarten de Rijke (University of Amsterdam)

- Conduct the pilot experiment and group the hallucination of the dialogue system into two types, i.e., intrinsic and extrinsic hallucination
- Propose the mixed contrastive learning method to reduce the hallucination, including two steps:
 - (1) Sample the most confused negative knowledge by retrieving from the corpus or deriving via model bootstrapping
 - (2) Construct the negative sample via two mixed strategies, i.e., entity-based mix-up and constituency-based mix-up, regarding different types of hallucination
- Demonstrated that our proposed method effectively reduces the hallucinating content generated by the language model and improve the truthfulness of dialogue systems.

LEADERSHIP EXPERIMENT (SELECTED)

Teaching Assistance

Teaching Assistance Program, Shandong University

Sep 2022 - Present

- Serve as a Teaching Assistant for multiple computer science courses, which include (1) Operating Systems, (2) Databases, (3) Natural Language Processing

Team Leader

Research Internship Team, Shandong University

Sep 2022 - Present

- Plan and facilitated weekly meetings and discussions
- Coordinate d the assignments for the interns

Team Leader

Education Support Society (ESS), Shandong University.

Sep 2021 - Sep 2022

- Lead a team of *ESS* to facilitate both online and offline teaching projects
- Honored with the National Outstanding Team recognition

HONOR & AWARD (SELECTED)

National Scholarship , Ministry of Education, China	<i>2021</i>
Dean's Scholarship , Shandong University, Department of Computer Science	<i>2022</i>
Presidential Scholarship , Shandong University, China	<i>2022</i>
Excellent Graduate , Shandong University, China	<i>2023</i>
Third Prize of World Artificial Intelligence Challenge Competition (WAIC)	<i>2022</i>