Siyu Yuan

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RESEARCH INTEREST

Siyu Yuan（员司雨）is a four-year Ph.D. student at Fudan University in the School of Data Science. Her research focuses on **Planning and Reasoning in Language Models**, including (but not limited to):

o **Self-Improvement Mechanisms**: Enhance the capabilities of language models on complex reasoning problems (such as Math, Puzzle and Interactive Planning Tasks) through self-improvement methods, such as *iterative self-reflection*, *evolutionary optimization*, and *automatic multi-agent collaboration*.

o **Complex Planning**: Investigate complex real-world planning in language models, including *multitask scheduling*, *social strategic planning* and *constrained language planning*.

o **Tool-Augmented Reasoning**: Improve real-world problem-solving by integrating *efficient tool utilization*, *analogical reasoning*, and *meta-action systems* for enhanced decision-making.

EDUCATION

Ph.D. in Statistics.   **Fudan University**
National Scholarship for Doctoral Students   *2021-2026 (estimated)*
B.S. in Data Science.   **Fudan University**
National Scholarship, Outstanding Graduate Student in Shanghai.   *2017-2021*

EXPERIENCE

ByteDance Seed-LLM-Horizon   *September 2024 - Present*
o Role: Research Intern
o Advisor: Dr. Jiangjie Chen and Dr. Jiecao Chen
o Topics: Revision Capabilities of Autonomous Agents [1]

Microsoft Research Asia   *September 2023 - Jun 2024*
o Role: Research Intern
o Advisor: Dr. Kaitao Song
o Topics: Autonomous Agents with Planning and Tool Use
o Project: Participate in the JARVIS project (**Github Stars: 23.6K**) [2] [3] [4]
o Honor: Stars of Tomorrow (Top 50%)

ByteDance AI-Lab   *January 2023 - May 2023*
o Role: Research Intern
o Advisor: Dr. Changzhi Sun and Jiaze Chen
o Topics: Evaluation and Improvement on the analogical reasoning abilities of LLMs [11].

Brain Technologies   *June 2022 - September 2022*
o Role: Research Intern
o Advisor: Dr. Charles Jankowski
o Topics: Symbolic Knowledge Distillation for Language Planning and LLM Prompt Engineering [7].

Knowledge Works Lab at Fudan University   *March 2019 - Present*
o Role: Student Researcher
o Advisor: Prof. Yanghua Xiao and Dr. Jiangjie Chen
o Topics: Knowledge Acquisition, e.g, Analogy-making [12], Entity Typing [14], and Concept Extraction [15] [13].

AWARDS AND ACHIEVEMENTS

China National Scholarship for Doctoral Students   *2024*
o Fudan University
ACL 2023 Outstanding Paper Award (Top 1%)   *2023*
o Association of Computational Linguistics
Huatai Securities Scholarship   *2023*
o Fudan University

Outstanding Graduate Student of Shanghai Colleges and University (Top 5%)   *2021*
　○ Fudan University
Outstanding Student pacemaker of Fudan University   *2021*
　○ Fudan University
China National Scholarship for Undergraduate   *2018*
　○ Fudan University

SELECTED PUBLICATIONS

[*: Equal Contribution; ♠: Student I Mentored; †: Project Leader;]

Planning and Reasoning..

[1] Agent-R: Training Language Model Agents to Reflect via Iterative Self-Training
Siyu Yuan*, Zehui Chen*, Zhiheng Xi, Junjie Ye, Zhengyin Du, Jiecao Chen
Long paper, Preprint, 2025. **Huggingface Daily Paper Top-1**

[2] EvoAgent: Towards Multi-Agent Generation via Evolutionary Algorithms
Siyu Yuan*, Kaitao Song*, Jiangjie Chen, Xu Tan, Dongsheng Li, Deqing Yang
Long paper, in: **NAACL 2025**.

[3] EasyTool: Enhancing LLM-based Agents with Concise Tool Instruction
Siyu Yuan*, Kaitao Song*, Jiangjie Chen, Xu Tan, Yongliang Shen, Ren Kan, Dongsheng Li, Deqing Yang
Long paper, in: **NAACL 2025**. In the JARVIS project (**Github Stars: 23.6K**)

[4] TaskBench: Benchmarking Large Language Models for Task Automation
Yongliang Shen*, Kaitao Song*, Xu Tan, Wenqi Zhang, Kan Ren, **Siyu Yuan**, Weiming Lu, Dongsheng Li, Yueting Zhuang
Long paper, in: **Neurips 2024**. In the JARVIS project (**Github Stars: 23.6K**)

[5] Put Your Money Where Your Mouth Is: Evaluating Strategic Planning and Execution of LLM Agents in an Auction Arena
Jiangjie Chen, **Siyu Yuan**, Rong Ye, Bodhisattwa Prasad Majumder, Kyle Richardson
Long paper, Preprint, 2024.

[6] TIMEARENA: Shaping Efficient Multitasking Language Agents in a Time-Aware Simulation
Yikai Zhang♠, **Siyu Yuan**†, Caiyu Hu, Kyle Richardson, Yanghua Xiao, Jiangjie Chen
Long paper, in: **ACL 2024**.

[7] Distilling Script Knowledge from Large Language Models for Constrained Language Planning
Siyu Yuan, Jiangjie Chen, Ziquan Fu, Xuyang Ge♠, Soham Shah, Charles Robert Jankowski, Yanghua Xiao, Deqing Yang
Long paper, in: **ACL 2023**. **Outstanding Paper Award** (Top 1%)

Cognitive Modeling..

[8] Unlocking Scientific Concepts: How Effective Are LLM-Generated Analogies for Student Understanding and Classroom Practice?
Zekai Shao*, **Siyu Yuan***, Lin Gao, Yixuan He, Deqing Yang, Siming Chen
Long paper, in: **CHI 2025**.

[9] From Persona to Personalization: A Survey on Role-Playing Language Agents
Jiangjie Chen*, Xintao Wang*, Rui Xu*, **Siyu Yuan***, Yikai Zhang*♠, Wei Shi*, Jian Xie*, Shuang Li♠, Ruihan Yang♠,
Tinghui Zhu, Aili Chen, Nianqi Li♠, Lida Chen, Caiyu Hu, Siye Wu, Scott Ren, Ziquan Fu, Yanghua Xiao
Long paper, in: **TMLR**.

[10] Boosting Scientific Concepts Understanding: Can Analogy from Teacher Models Empower Student Models?
Siyu Yuan*, Jiayang Cheng*, Lin Qiu, Deqing Yang
Short paper, in: **EMNLP 2024**.

[11] AnalogyKB: Unlocking Analogical Reasoning of Language Models with A Million-scale Knowledge Base
Siyu Yuan*, Jiangjie Chen*, Jiaqing Liang, Changzhi Sun, Yanghua Xiao, Deqing Yang
Long paper, in: **ACL 2024**.

[12] Beneath Surface Similarity: Large Language Models Make Reasonable Scientific Analogies after Structure Abduction
Siyu Yuan, Jiangjie Chen, Xuyang Ge♠, Yanghua Xiao, Deqing Yang
Long paper, in: **EMNLP 2023** (Findings).

[13] Causality-aware Concept Extraction based on Knowledge-guided Prompting
Siyu Yuan, Deqing Yang, Jinxi Liu, Shuyu Tian, Jiaqing Liang, Yanghua Xiao, Rui Xie
Long paper, in: **ACL 2023**.

[14] Generative Entity Typing with Curriculum Learning
Siyu Yuan, Deqing Yang, Jiaqing Liang, Zhixu Li, Jinxi Liu, Jingyue Huang, Yanghua Xiao
Long paper, in: **EMNLP 2022**.

[15] Large-Scale Multi-granular Concept Extraction Based on Machine Reading Comprehension
Siyu Yuan, Deqing Yang, Jiaqing Liang, Jilun Sun, Jingyue Huang, Kaiyan Cao, Yanghua Xiao, Rui Xie.

Long paper, in: **ISWC 2021**.

OTHER PUBLICATIONS

[*: Equal Contribution; ♠: Student I Mentored; †: Project Leader;]

[16] CoSER: Coordinating LLM-Based Persona Simulation of Established Roles
Xintao Wang, Heng Wang, Yifei Zhang, Xinfeng Yuan, Rui Xu, Jen-tse Huang, **Siyu Yuan**, Haoran Guo, Jiangjie Chen, Wei Wang, Yanghua Xiao, Shuchang Zhou
Long paper, Preprint, 2025.

[17] ToolHop: A Query-Driven Benchmark for Evaluating Large Language Models in Multi-Hop Tool Use
Junjie Ye, Zhengyin Du, Xuesong Yao, Weijian Lin, Yufei Xu, Zehui Chen, Zaiyuan Wang, Sining Zhu, Zhiheng Xi, **Siyu Yuan**, Tao Gui, Qi Zhang, Xuanjing Huang, Jiechao Chen
Long paper, Preprint, 2025.

[18] Past Meets Present: Creating Historical Analogy with Large Language Models
Nianqi Li♠, **Siyu Yuan**, Jiangjie Chen, Jiaqing Liang, Feng Wei, Zujie Liang, Deqing Yang, Yanghua Xiao
Long paper, Preprint 2024.

[19] MultiLingPoT: Enhancing Mathematical Reasoning with Multilingual Program Fine-tuning
Nianqi Li, Zujie Liang, **Siyu Yuan**, Jiaqing Liang, Feng Wei, Yanghua Xiao
Long paper, Preprint, 2024.

[20] Revealing the Barriers of Language Agents in Planning
Jian Xie, Kexun Zhang, Jiangjie Chen, **Siyu Yuan**, Kai Zhang, Yikai Zhang, Lei Li, Yanghua Xiao
Long paper, in: **NAACL 2025**.

[21] WAPITI: A Watermark for Finetuned Open-Source LLMs
Lingjie Chen♠, Ruizhong Qiu, **Siyu Yuan**, Zhining Liu, Tianxin Wei, Hyunsik Yoo, Zhichen Zeng, Deqing Yang, Hanghang Tong
Long paper, Preprint, 2024.

[22] Evaluating Character Understanding of Large Language Models via Character Profiling from Fictional Works
Xinfeng Yuan♠, **Siyu Yuan**†, Yuhan Cui*♠, Tianhe Lin♠, Xintao Wang, Rui Xu, Jiangjie Chen, Deqing Yang
Long paper, in: **EMNLP 2024**.

[23] "A good pun is its own reword": Can Large Language Models Understand Puns?
Zhijun Xu♠, **Siyu Yuan**†, Lingjie Chen♠, Deqing Yang
Long paper, in: **EMNLP 2024**.

[24] SELFGOAL: Your Language Agents Already Know How to Achieve High-level Goals
Ruihan Yang♠, Jiangjie Chen, Yikai Zhang♠, **Siyu Yuan**, Kyle Richardson, Yanghua Xiao, Deqing Yang
Long paper, in: **NAACL 2025**.

[25] MINDECHO: Role-Playing Language Agents for Key Opinion Leaders
Rui Xu, Dakuan Lu, Xiaoyu Tan, Xintao Wang, **Siyu Yuan**, Jiangjie Chen, Wei Chu, Xu Yinghui
Long paper, Under Review, 2024.

[26] Character is Destiny: Can Large Language Models Simulate Persona-Driven Decisions in Role-Playing?
Rui Xu, Xintao Wang, Jiangjie Chen, **Siyu Yuan**, Xinfeng Yuan♠, Jiaqing Liang, Zulong Chen, xiaoqingdong, Yanghua Xiao
Long paper, Preprint, 2024.

[27] InCharacter: Evaluating Personality Fidelity in Role-Playing Agents through Psychological Interviews
Xintao Wang, Yunze Xiao, Jen-tse Huang, **Siyu Yuan**, Rui Xu, Haoran Guo, Quan Tu, Yaying Fei, Ziang Leng, Wei Wang, Jiangjie Chen, Cheng Li, Yanghua Xiao
Long paper, in: **ACL 2024**.

[28] Light Up the Shadows: Enhance Long-Tail Entity Grounding with Concept-Guided Vision-Language Models
Yikai Zhang♠, Qianyu He, Xintao Wang, **Siyu Yuan**, Jiaqing Liang, Yanghua Xiao
Long paper, in: **ACL 2024** (Findings).

[29] Translate Meanings, Not Just Words: IdiomKB's Role in Optimizing Idiomatic Translation with Language Models
Shuang Li♠, Jiangjie Chen, **Siyu Yuan**, Xinyi Wu, Hao Yang, Shimin Tao, Yanghua Xiao
Long paper, in: **AAAI 2024**.

[30] Contextual Information and Commonsense Based Prompt for Emotion Recognition in Conversation
Jingjie Yi, Deqing Yang, **Siyu Yuan**, Kaiyan Cao, Zhiyao Zhang and Yanghua Xiao
Long paper, in: **ECML PKDD 2022**.

Academic Service

o Program Committee/Reviewer of EMNLP (2022-), APIN (2022-), ACL ARR (2023-), ICLR (2024), COLM (2024), and some corresponding workshops