

Yuhang Zhou

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RESEARCH INTERESTS

Natural Language Processing, Large Language Model Fine-tuning, Computational Social Science

EDUCATION

University of Maryland, College Park, the U.S.

- *Ph.D. in Information Studies*

- Coursework: Natural Language Understanding, Computational Linguistics

GPA: 3.98/4.0

University of Michigan, Ann Arbor, the U.S.

- *Bachelor of Science in Data Science*

- Coursework: Deep Learning for Vision, Data Mining, Database Management System

May 2020

GPA: 3.90/4.0

Shanghai Jiao Tong University, Shanghai, China

- *Bachelor of Science in Electrical and Computer Engineering*

- Coursework: Data Mining and Machine Learning, Honors Mathematics, Discrete Mathematics

Aug 2020

GPA: 3.56/4.0

RESEARCH

University of Maryland

- *Concept Spurious Correlation in LLMs, advised by Prof. Furong Huang*

- Explored the spurious correlation at the concept level for large language model fine-tuning or in-context learning.
- Utilized the advanced LLMs to generate the “counterfactual” sentences to resolve the spurious correlation.
- Data augmentation method can bring 1.44% relative improvement on classification benchmarks and effectively mitigate performance bias.

- *LLM Long-tailed Knowledge Distillation, advised by Prof. Furong Huang*

- Developed a framework with active learning and data augmentation to resolve the challenges of LLM knowledge distillation on long-tailed datasets.
- Proposed framework can bring about a relative improvement of 6.81% on long-tailed datasets.

- *Image Sequence Benchmarks, advised by Prof. Furong Huang*

- Constructed a benchmark for image sequences with varying lengths and assessed the performance of current vision-language models on developed benchmarks.
- Analyzed the unsuccessful cases and identified three failure reasons for current vision-language models.

University of Maryland, CLIP Lab

- *Emoji Diffusion on the Social Networks, advised by Prof. Wei Ai*

- Explored the diffusion patterns of newly created emojis on social media on the frequency and semantic aspects.
- Discovered the negative effect of new emojis on the sentiment classification task of language models.
- Proposed a emoji substitution method to resolve out-of-vocabulary challenges and lead to a 6.92% relative improvement on tweets with new emojis.

SELECTED PUBLICATION

• **Zhou, Yuhang***, Jing Zhu*, Paiheng Xu, Xiaoyu Liu, Xiyao Wang, Danai Koutra, Wei Ai, and Furong Huang. Multi-stage balanced distillation: Addressing long-tail challenges in sequence-level knowledge distillation. *Findings of EMNLP 2024*, 2024

• **Zhou, Yuhang**, Paiheng Xu, Xiaoyu Liu, Bang An, Wei Ai, and Furong Huang. Explore spurious correlations at the concept level in language models for text classification. *ACL 2024*, 2024a

• **Zhou, Yuhang** and Wei Ai. Teaching-assistant-in-the-loop: Improving knowledge distillation from imperfect teacher models in low-budget scenarios. *Findings of ACL 2024*, 2024

• Xiyao Wang, **Zhou, Yuhang**, Xiaoyu Liu, Hongjin Lu, Yuancheng Xu, Feihong He, Jaehong Yoon, Taixi Lu, Gedas Bertasius, Mohit Bansal, et al. Mementos: A comprehensive benchmark for multimodal large language model reasoning over image sequences. *ACL 2024*, 2024

• Jing Zhu*, **Zhou, Yuhang***, Vassilis N Ioannidis, Shengyi Qian, Wei Ai, Xiang Song, and Danai Koutra. Pitfalls in link prediction with graph neural networks: Understanding the impact of target-link inclusion & better practices. In *ACM International Conference on Web Search and Data Mining (WSDM)*, 2024

• **Zhou, Yuhang***, Suraj Maharjan*, and Beiye Liu. Scalable prompt generation for semi-supervised learning with language models. In *Findings of EACL 2023*, 2023

PREPRINT

- **Zhou, Yuhang**, Xuan Lu, and Wei Ai. From adoption to adaption: Tracing the diffusion of new emojis on twitter. *arXiv*, 2024b
- Jing Zhu, **Zhou, Yuhang**, Shengyi Qian, Zhongmou He, Tong Zhao, Neil Shah, and Danai Koutra. Multimodal graph benchmark. *arXiv preprint arXiv:2406.16321*, 2024

INTERNSHIP

Amazon AGI, New York, USA

- *Applied Scientist Intern, Manager: Giannis Karamanolakis* May 2024-Aug 2024
 - Designed a novel MoE (Mixture of Experts) architecture to incorporate heterogeneous expert models.
 - Proposed multiple routing heuristics to improve MoE performance when merging without fine-tuning.

Amazon Alexa AI, Boston, USA

- *Applied Scientist Intern, Manager: Yuguang Yue* May 2023-Aug 2023
 - Designed a unified large language model knowledge distillation framework with student model signals to improve the student model fine-tuning performance.
 - Conducted extensive experiments on datasets and multiple public models with the corresponding promoting methods.
 - Proposed two-stage framework brings a relative improvement of up to 20.79% compared to random fine-tuning (paper published in *Findings of ACL*, 2024)

Amazon Alexa AI, New York, USA

- *Applied Scientist Intern, Manager: Beiye Liu* May 2022-Aug 2022
 - Designed a new prompt-tuning semi-supervised learning pipeline for large language models without manual prompts and verbalizers to promote the scalable text classification.
 - Reproduced the state-of-the-art few-shot prompt-tuning methods as the experiment baseline results.
 - Proposed method brings a relative improvement of 2.52% over the previous method with manual prompts and verbalizers (paper published in *Findings of EACL*, 2023)

Alibaba Group, Hangzhou, China

- *Research Intern, Manager: Tianyu Li* May 2021-Aug 2021
 - Applied Siamese BERT-Networks to retrieve items of Taobao, given particular style descriptions.

SKILLS

- Language: Proficient in Python, SQL, \LaTeX , C++, C, R, Java, JavaScript