Zhao Haiteng

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Research Interest

As a fifth-year Ph.D. student in machine learning, my primary interests lie in the realm of **Reasoning and Planning** in Natural Language Processing (NLP), encompassing a range of perspectives such as **Model Reliability**, **Language Agents**, and **Language Model Design and Training**. Additionally, I am also interested in the application of reasoning and planning in the context of **AI for Science**.

Education

Peking University, Beijing, China   2020 – Present

Ph.D. student in Intelligent Science and Technology, Advisor: Zhihong Deng, expected July 2025

Peking University, Beijing, China   2016 – 2020

B.S. in Psychology, Advisor: Hang Zhang

Experience

Shanghai AI Lab   2024.11 – Present

Research Intern   Mentor: Wenwei Zhang & Zhiyong Wu

Focusing on analyzing the post-training generalization challenges of LLMs for interactive agent tasks and exploring feasible methods to address these challenges.

Conducting research on R1-like reasoning and agent planning for multi-modal LLMs.

Tencent AI Lab NLP   2024.3 – 2024.10

Research Intern

Conduct research to improve the planning capacity and reliability of language models through reinforcement learning on search trees.

By expanding the multi-turn planning task trajectory in a step-level policy, the model's planning tree space is detected and optimized using reinforcement learning.

ByteDance Data-AML-US   2023.8 – 2024.2

Research Intern   Mentor: JingJing Xu

Enable language agents to iteratively acquire and improve skills through interactions with their environment.

Explore frameworks for language models to devise tools for solving mathematical and reasoning challenges.

The University of Hong Kong   2022.12 – 2023.6

Research Intern   Advisor: Lingpeng Kong and Qi Liu

Investigate the application of instruction-based zero-shot learning for language models in the chemistry and biological domains.

Examine the feasibility of replacing MSA augmentation in protein language models with a general retrieval method.

Microsoft Research Asia   2022.1 – 2022.10

Research Intern   Mentor: Shuming Ma

Explore multilingual continue learning for language model pre-training, enabling pre-training on dynamically increasing corpora.

Design innovative transformers that can take advantage of model depth when working with graph data.

Nanyang Technological University   2021.6 – Present

Collaboration   Advisor: Prof. Luu Anh Tuan

Work on the certified robustness of language models against perturbations in language forms by causal interventions.

Investigate the models' reasoning robustness, particularly in relation to their reliability against knowledge perturbations.

PUBLICATIONS

ϕ-**Decoding: Adaptive Foresight Sampling for Balanced Inference-Time Exploration and Exploitation**
Fangzhi Xu, Hang Yan, Chang Ma, **Haiteng Zhao**, Jun Liu, Qika Lin, Zhiyong Wu
arXiv preprint 2025

Benchmarking and Enhancing Large Language Models for Biological Pathway Reasoning
Haiteng Zhao, Chang Ma, Lingpeng Kong, Zhi-Hong Deng.
arXiv preprint 2025

Non-myopic Generation of Language Model for Reasoning and Planning
Chang Ma, **Haiteng Zhao**, Junlei Zhang, Junxian He, Lingpeng Kong
ICLR 2025

Instruction-Based Molecular Graph Generation with Unified Text-Graph Diffusion Model
Yuran Xiang, **Haiteng Zhao**, Chang Ma, Zhi-Hong Deng
arXiv preprint 2024

Empowering Large Language Model Agents through Action Learning
Haiteng Zhao, Chang Ma, Guoyin Wang, Jing Su, Lingpeng Kong, Jingjing Xu, Zhi-Hong Deng, Hongxia Yang.
COLM 2024

Exploring the Reasoning Abilities of Multimodal Large Language Models (MLLMs): A Comprehensive Survey on Emerging Trends in Multimodal Reasoning
Yiqi Wang, Wentao Chen, Xiaotian Han, Xudong Lin, **Haiteng Zhao**, Yongfei Liu, Bohan Zhai, Jianbo Yuan, Quanzeng You, Hongxia Yang.
arXiv preprint 2024

GIMLET: A Unified Graph-Text Model for Instruction-Based Molecule Zero-Shot Learning
Haiteng Zhao, Shengchao Liu, Chang Ma, Hannan Xu, Jie Fu, Zhi-Hong Deng, Lingpeng Kong, Qi Liu.
NeurIPS 2023

ChatPathway: Conversational Large Language Models for Biology Pathway Detection
Yanjing Li, Hannan Xu, **Haiteng Zhao**, Hongyu Guo, Shengchao Liu
NeurIPS 2023 AI for Science Workshop

Retrieved Sequence Augmentation for Protein Representation Learning
Chang Ma, **Haiteng Zhao**, Lin Zheng, Jiayi Xin, Qintong Li, Lijun Wu, Zhihong Deng, Yang Lu, Qi Liu, Lingpeng Kong.
EMNLP 2024

Are More Layers Beneficial to Graph Transformers?
Haiteng Zhao, Shuming Ma, Dongdong Zhang, Zhi-Hong Deng, Furu Wei.
ICLR 2023

Certified Robustness Against Natural Language Attacks by Causal Intervention
Haiteng Zhao‡, Chang Ma‡, Xinshuai Dong‡, Anh Tuan Luu, Zhi-Hong Deng, Hanwang Zhang.

ICML 2022

Domain Adaptation via Mutual Information Maximization
Haiteng Zhao, Chang Ma, Qinyu Chen, Zhihong Deng.
IJCAI 2022 (Long presentation)

SKILLS

- Programming Languages: Python(Pytorch,Tensorflow) > C++ == C
- Platform: Linux
- Development: Web
- Others: LaTex, MarkDown

HONORS AND AWARDS

Award of Scientific Research	Dec. 2018
Award of Merit Student	Dec. 2022
Guorui Scholarship	Dec. 2022