

ZHIWEI XU

Email: zhiweixu@umich.edu | Tel: (+1) 616-227-1677 | Web: zhiweixx.github.io

RESEARCH INTERESTS

My research interests focus on designing more efficient model architectures, self-improving pipelines, and more effective training strategies for agentic models.

Previously, I have spent time on statistical inference and deep learning theory, where I was fortunate to collaborate with many great senior mentors and talented peers.

EDUCATION

| | |
|---|--|
| University of Michigan Ph.D. student, <i>Department of Statistics</i> Advisor: Prof. Wei Hu and Prof. Yixin Wang | <i>Ann Arbor, U.S.</i> 2022 - present |
| University of Science and Technology of China Bachelor of Science, <i>Department of Statistics</i> | <i>Hefei, China</i> 2018 - 2022 |

EXPERIENCES

| | |
|--|--|
| Google Research Student Researcher Host: Hrayr Harutyunyan | <i>New York</i> May.2025 - Oct.2025 |
| Simons Institute, UC Berkeley Visiting Student Researcher Program: Modern Paradigms in Generalization | <i>Hybrid</i> Aug - Nov.2024 |
| Cubist Systematic Strategies, LLC Quantitative Research Intern | <i>New York</i> Jun - Aug.2024 |

- Introduced horizontal residual connection into transformer to improve the LLM pretraining, validated across model sizes ranging from 250M to 3B parameters. Leveraged techniques such as mixed precision, DeepSpeed, and FlashAttention for efficient multi-node training.

PUBLICATIONS AND PREPRINTS

- [8] Transformers with Improved Horizontal Information Flow
Zhiwei Xu, Hrayr Harutyunyan, Srinadh Bhojanapalli, Asher Trockman, Sanjiv Kumar
- [7] Terminal-Bench: A Benchmark for Agents on Hard, Realistic Tasks in Command Line Interfaces
Mike Merrill, et al.
Submitted, 2025
- [6] Recommendations Beyond Catalogs: Diffusion Models for Personalized Generation
Gabriel Patron, **Zhiwei Xu**, Ishan Kapnadak, Felipe Maia Polo
Submitted, 2025
- [5] Benign Overfitting in Single-Head Attention
Roey Magen*, Shuning Shang*, **Zhiwei Xu**, Spencer Frei, Wei Hu, Gal Vardi
Neural Information Processing Systems (**NeurIPS**), 2025
- [4] Let Me Grok for You: Accelerating Grokking via Embedding Transfer from a Weaker Model
Zhiwei Xu*, Zhiyu Ni*, Yixin Wang[◦], Wei Hu[◦]
International Conference on Learning Representations (**ICLR**) 2025

[3] Benign Overfitting and Grokking in ReLU Networks for XOR Cluster Data

Zhiwei Xu, Yutong Wang, Spencer Frei, Gal Vardi, Wei Hu

International Conference on Learning Representations (**ICLR**) 2024

[2] Inference of Dependency Knowledge Graph for Electronic Health Records

Zhiwei Xu, Ziming Gan, Doudou Zhou, Shuting Shen, Junwei Lu*, Tianxi Cai*

Journal of the Royal Statistical Society, Series B, 2025

[1] ARCH: Large-scale Knowledge Graph via Aggregated Narrative Codified Health Records Analysis

Ziming Gan*, Doudou Zhou*, et al.

Journal of Biomedical Informatics, 2025

(Note: authors with * contributed equally to the work)

SELECTED AWARDS AND HONORS

Graduate Student Research Competition Award at IMPS 2024

July 2024

Outstanding GSI (teaching) Award

April. 2024

Outstanding Graduates at USTC

May. 2022

Gold Prize for Outstanding Scholarship at USTC

Oct. 2019, 2020

SKILLS

PyTorch, Python, SQL, Git, Docker, R