ZHIWEI XU

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RESEARCH INTERESTS

My research interests focus on designing more efficient model architecture and better training of 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 *Ann Arbor, U.S.*
Ph.D. student, *Department of Statistics* *2022 - present*
Advisor: Prof. Wei Hu and Prof. Yixin Wang

University of Science and Technology of China *Hefei, China*
Bachelor of Science, *Department of Statistics* *2018 - 2022*

EXPERIENCES

Google Research *New York*
Student Researcher *May.2025 - Oct.2025*
Host: Hrayr Harutyunyan and Asher Trockman

- 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.

Simons Institute, UC Berkeley *Hybrid*
Visiting Student Researcher *Aug - Nov.2024*
Program: Modern Paradigms in Generalization

Cubist Systematic Strategies, LLC *New York*
Quantitative Research Intern *Jun - Aug.2024*

- Pretrained and fine-tuned LLMs on financial event transcripts to generate tradable signals.

Harvard University *Remote*
Visiting student, *Department of Biostatistics* *May.2021 - May.2022*
Advisor: Prof. Junwei Lu and Prof. Tianxi Cai

- Developed a generative model with rigorous uncertainty-quantification guarantees, that captures the complex temporal and categorical patterns found in electronic health records (EHR) and validated its performance on large-scale EHR data.

PUBLICATIONS AND PREPRINTS

[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$^{\diamond}$, Wei Hu$^{\diamond}$
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