BO CHEN

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EDUCATION

Middle Tenneessee State University   USA
B.S. in Mathematics and applied mathematics (Current GPA: 3.203/4)   *01/2022 - 05/2025*

AREA OR INTEREST

My research interests primarily focus on exploring theoretical foundations, optimizing methodologies, and accelerating the performance of machine learning models.

PUBLICATION & MANUCRIPT

* denotes equal contribution.

1. **Chen Bo*** , Liang Yingyu* , Sha Zhizhou* , Shi Zhenmei* , Song Zhao* "Hsr-enhanced sparse attention acceleration" In submission to **CPAL 2025** Paper

2. **Chen Bo*** , Li Xiaoyu* , Liang Yingyu* , Shi Zhenmei* , Song Zhao* "Bypassing the exponential dependency: Looped transformers efficiently learn in-context by multi-step gradient descent" In submission to **AISTATS 2025** Paper

3. **Chen Bo*** , Li Xiaoyu* , Liang Yingyu* , Long Jiangxuan* , Shi Zhenmei* , Song Zhao* "Circuit Complexity Bounds for RoPE-based Transformer Architecture" In submission to **CVPR 2025** Paper

4. Shen Xuan* , Song Zhao* , Zhou Yufa* , **Chen Bo*** , Li Yanyu , Gong Yifan , Zhang Kai , Tan Hao , Kuen Jason , Ding Henghui , Shu Zhihao , Niu Wei , Zhao Pu , Wang Yanzhi , Gu Jiuxiang "LazyDiT: Lazy Learning for the Acceleration of Diffusion Transformers" In submission to **AAAI 2025**

5. Shen Xuan* , Song Zhao* , Zhou Yufa* , **Chen Bo*** , Liu Jing , Zhang Ruiyi , Rossi Ryan A. , Tan Hao , Yu Tong , Chen Xiang , Zhou Yufan , Sun Tong , Zhao Pu , Wang Yanzhi , Gu Jiuxiang "Numerical Pruning for Efficient Autoregressive Models" In submission to **AAAI 2025**

RESEARCH EXPERIENCE

Research Assistant   USA
Supervised by Zhenmei Shi, Zhao Song, Yingyu Liang   *05/2024 - Present*
- Focus on researching the interpretability of modern large models, exploring methods to enhance transparency and efficiency. Work on algorithmic acceleration within models, and analyze the theoretical bounds of complexity and resource requirements.

Research Assistant   USA
MTSU | Supervised by Letian Zhang   *12/2023 - 05/2024*
- Develop a federated learning framework that addresses device heterogeneity through adaptive tensor selection which aims to improve training efficiency and model performance across devices with varying computational capabilities.

Research Assistant   Beijing, China

Beijing HEZHENG Software Co., ltd.   *05/2023 - 10/2023*

- Large model acceleration in distributed learning: focus on optimization techniques such as parallelism, model partitioning, and communication efficiency to improve performance and scalability in multi-node environments.

Research Assistant   Tokyo, Japan

The University of Tokyo | Institute of Science Tokyo   *05/2022 - 9/2022*

- Explore the stability characteristics of homology groups of manifolds under perturbations across different dimensions. Investigate the preservation mechanisms of topological invariants during manifold deformations, focusing on their invariance properties in dynamic settings.

Skills

Language: Mandarin, Japanese, English

Programming: LaTeX, Python, Tensorflow, Pytorch, Jax, OpenCV, C++