

# BO CHEN

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## EDUCATION

**Middle Tennessee State University**  
*B.S. in Mathematics and applied mathematics*

USA  
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\***, Qin Lianke\*, Song Zhao\* "Is Solving Graph Neural Tangent Kernel Equivalent to Training Graph Neural Network?" In submission to **CPAL 2025**
3. **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]
4. **Chen Bo\***, Yifang Chen\*, Deng Yichuan\*, Song Zhao\*, Wang Yitan\* "A Nearly Optimal Size Coreset Algorithm with Nearly Linear Time" In submission to **AISTATS 2025**
5. **Chen Bo\***, Ke Yekun\*, Shrivastava Anshumali\*, Song Zhao\*, Xu Zhaozhuo\* "A Theoretical Analysis Of Nearest Neighbor Search On Approximate Near Neighbor Graph" In submission to **AISTATS 2025**
6. **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]
7. 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 "Lazy-DiT: Lazy Learning for the Acceleration of Diffusion Transformers" **Accepted by AAAI 2025** (to appear)
8. 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" **Accepted by AAAI 2025** (to appear)

## 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.

## AWARD & HONOR

### Academic Performance Scholarship

USA

Middle Tennessee State University

11/2023

- \* Recognition outstanding coursework and positive seminar outcomes that have had a significant impact during the period.

### Research Progress Award

Beijing, China

Beijing HEZHENG Software Co., Ltd.

09/2023

- \* Recognition for continuous advancement in data analytics research projects.

### Department Research Contribution Award

Tokyo, Japan

The University of Tokyo / Institute of Science Tokyo

11/2022

- \* Recognition for active participation and valuable input in departmental research activities.

## Skills

**Language:** Mandarin, Japanese, English

**Programming:**  $\LaTeX$ , Python, Tensorflow, Pytorch, Jax, OpenCV, C++