

Zhenshuo Zhang

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Research Interests

Training algorithms in machine learning, data attribution, reinforcement learning, multitask learning, and optimization for ML.

Education

Northeastern University

Ph.D. in Computer Science

Sep 2024 – Present

Advisor: Hongyang Zhang

Zhejiang University

M.S. in Computer science

Sep 2021 – Mar 2024

Advisor: Siliang Tang

Zhejiang University

B.Eng. in Computer Science

Sep 2017 – Jun 2021

Selected Publications

Efficient Estimation of Kernel Surrogate Models for Task Attribution

Zhenshuo Zhang, Minxuan Duan, Hongyang R. Zhang

ICLR 2026

- We theoretically prove that influence functions and datamodels are equivalent: both provide first-order estimates of data attribution.
- Building on this analysis, we introduce a kernel surrogate model that captures nonlinear interactions among training data and tasks.

Scalable Multi-Objective and Meta Reinforcement Learning via Gradient Estimation

Zhenshuo Zhang, Minxuan Duan, Youran Ye, Hongyang R. Zhang

AAAI 2026

- We use a first-order gradient estimation of PPO outcomes to efficiently predict policy performance when training on different combinations of tasks.
- Using the predicted performance, we optimize a partition of the task set and train an ensemble of policies, one for each task group.

Linear-Time Demonstration Selection for In-Context Learning via Gradient Estimation

Ziniu Zhang*, **Zhenshuo Zhang***, Dongyue Li, Lu Wang, Jennifer Dy, Hongyang R. Zhang

*EMNLP 2025; * equal contribution*

- We use a first-order gradient estimation to efficiently predict LLM output quality under different combinations of prompts.
- Based on the predicted LLM performance, we select the best-performing sequence of demonstrations.

Other Publications

WinQ: Accelerating Quantization-Aware Training of Language Models Around Saddle Points

Dongyue Li, Zechun Liu, Kai Yi, **Zhenshuo Zhang**, Changsheng Zhao, Raghuraman Krishnamoorthi, Harshit Khaitan, Hongyang R. Zhang, Steven Li

ICML 2026

Efficiently Learning Branching Networks for Multitask Algorithmic Reasoning

Dongyue Li, **Zhenshuo Zhang**, Minxuan Duan, Edgar Dobriban, Hongyang R. Zhang

KDD 2026

One-Sided Matrix Completion from Ultra-Sparse Samples

Hongyang R. Zhang, **Zhenshuo Zhang**, Huy L. Nguyen, Guanghui Lan

Transactions on Machine Learning Research

GraphControl: Adding Conditional Control to Universal Graph Pre-trained Models for Graph Domain Transfer Learning

Yun Zhu, Yaoke Wang, Haizhou Shi, **Zhenshuo Zhang**, Dian Jiao, Siliang Tang

WWW 2024

MARIO: Model Agnostic Recipe for Improving OOD Generalization of Graph Contrastive Learning

Yun Zhu, Haizhou Shi, **Zhenshuo Zhang**, Siliang Tang

WWW 2024

Structure-Aware Group Discrimination with Adaptive-View Graph Encoder: A Fast Graph Contrastive Learning Framework

Zhenshuo Zhang, Yun Zhu, Haizhou Shi, Siliang Tang

ECAI 2023

Talks

- Gave a talk at INFORMS (Oct 2025).

Honors and Awards

- Zhejiang Provincial Outstanding Graduate Award, 2024
- Outstanding Undergraduate Award, Zhejiang University, 2021