

RESEARCH INTERESTS

Foundation Models (LLM/Diffusion Model): Efficiency (Model Sparsification, MoE, Memory-Efficient Fine-Tuning, Parameter-Efficient Fine-Tuning), Trustworthiness (Machine Unlearning, Alignment, Privacy)
Machine Learning: Bi-Level Optimization, Zeroth-Order Optimization, Invariant Risk Minimization

EDUCATION

Michigan State University (MSU)	Jan. 2022 - Present
Ph.D. Candidate, Computer Science	Advisor: Prof. Sijia Liu
Huazhong University of Science and Technology (HUST)	Sep. 2015 - Jun. 2019
B.S.c, Automation	Qiming Honor College of HUST
National Scholarship * 2 (Top 0.2%, highest undergraduate honor in China)	2016 & 2017

HONORS

Research Awards

- IBM PhD Fellowship 2024
- MLCommons Rising Star Award [\[ML Commons News\]](#) 2024
- UAI 2022 Best Paper Runner-up Award [\[Certificate\]](#) 2022
- CVPR Outstanding Reviewer Award * 2 [\[2023\]](#) & [\[2024\]](#)
- NeurIPS Top Reviewer Award * 2 [\[2022\]](#) & [\[2023\]](#)

Conference Travel Grants

- NeurIPS Scholar Award * 2 2022 & 2023
- AAAI Travel Grant Award 2023
- ICML Travel Grant Award 2022
- UAI Student Scholarship 2022

PROFESSIONAL EXPERIENCE

Meta AI	Sep. 2024 - Present
Research Scientist Intern, Supervisor: Dr. Xi Liu	
Project: Multi-Agent LLM Reasoning	
Cisco Research	Dec. 2023 - Aug. 2024
Research Intern, Supervisor: Dr. Gaowen Liu	
Project: Machine Unlearning for Foundation Models: LLMs, Diffusion Models, and MoEs.	
Amazon AWS AI Lab	May. 2023 - Aug. 2023
Applied Scientist Intern, Supervisor: Dr. Zhou Ren , Dr. Tian Lan	
Project: In-context learning for vision generative models: design, training, and generalization study.	
JD AI Research (JD Explore Academy)	Jan. 2021 - Aug. 2021
Research Intern, Supervisor: Dr. Jinfeng Yi	
Project: Model robustness, fairness, and explainability co-design.	

PUBLICATIONS

Yihua Zhang has co-authored over 20 papers in top-tier machine learning and computer vision venues (NeurIPS, ICML, ICLR, CVPR, ICCV, ECCV, *etc.*) and published over 10 first-authored papers. Google scholar citation count stands at 712 (as of Dec. 15, 2024). Below are his publications: * **indicates an equal contribution**, and ‡ **denotes the author is his mentee**.

▷ Thrust I. Efficient Machine Learning

AAAI'25: C. Jin[‡], T. Huang, **Y. Zhang**, M. Pechenizkiy, S. Liu, S. Liu, T. Chen, “Visual prompting upgrades neural network sparsification: A data-model perspective”, The Forty-first International Conference on Machine Learning, [\[PDF\]](#), [\[Code\]](#).

ICML'24: **Y. Zhang**, P. Li, J. Hong, J. Li, Y. Zhang, W. Zheng, P.-Y. Chen, J. Lee, W. Yin, M. Hong, Z. Wang, S. Liu, and T. Chen, “Revisiting Zeroth-Order Optimization for Memory-Efficient LLM Fine-Tuning: A Benchmark”, The Forty-first International Conference on Machine Learning, [\[PDF\]](#), [\[Code\]](#), [\[Website\]](#).

IEEE Signal Process. Mag.'24: **Y. Zhang**, P. Khanduri, I. Tsaknakis, Y. Zhang, M. Hong, S. Liu, “An Introduction to Bi-level Optimization: Foundations and Applications in Signal Processing and Machine Learning”, IEEE Signal Processing Magazine, vol. 41, no. 1, pp. 38-59, 2024, [\[PDF\]](#) (Feature Article).

ICLR'24: A. Chen[‡], Y. Zhang, J. Jia, J. Diffenderfer, J. Liu, K. Parasyris, **Y. Zhang**, Z. Zhang, B. Kailkhura, S. Liu, “DeepZero: Scaling up Zeroth-Order Optimization for Deep Model Training”, 12th International Conference on Learning Representations, [\[PDF\]](#), [\[Code\]](#).

IEEE J. Sel. Topics Signal Process.'24: H. Li, S. Zhang, **Y. Zhang**, M. Wang, S. Liu, P.-Y. Chen, “How Does Promoting the Minority Fraction Affect Generalization? A Theoretical Study of One-Hidden-Layer Network on Group Imbalance”, IEEE Journal of Selected Topics in Signal Processing, 2024, [\[PDF\]](#).

NeurIPS'23: **Y. Zhang**, Y. Zhang, A. Chen, J. Jia, J. Liu, G. Liu, S. Chang, M. Hong, S. Liu, “Selectivity Drives Productivity: Efficient Dataset Pruning for Enhanced Transfer Learning”, 37th Conference on Neural Information Processing Systems, [\[PDF\]](#), [\[Code\]](#), [\[Website\]](#).

ICCV'23 Oral: **Y. Zhang**, R. Cai, T. Chen, G. Zhang, P.-Y. Chen, H. Zhang, S. Chang, W. Zhang, S. Liu, “Robust Mixture-of-Expert Training for Convolutional Neural Networks”, International Conference on Computer Vision 2023, [\[PDF\]](#), [\[Code\]](#).

CVPR'23: A. Chen[‡], Y. Yao, P.-Y. Chen, **Y. Zhang**, S. Liu, “Understanding and Improving Visual Prompting: A Label-Mapping Perspective”, 2023 Conference on Computer Vision and Pattern Recognition, [\[PDF\]](#), [\[Code\]](#).

CVPR'23: H. Zhuang[‡], **Y. Zhang**, S. Liu, “A Pilot Study of Query-Free Adversarial Attack against Stable Diffusion”, 2023 Conference on Computer Vision and Pattern Recognition, [\[PDF\]](#), [\[Code\]](#).

NeurIPS'22: **Y. Zhang**, Y. Yao, P. Ram, P. Zhao, T. Chen, M. Hong, Y. Wang, S. Liu, “Advancing Model Pruning via Bi-level Optimization”, 36th Conference on Neural Information Processing Systems, [\[PDF\]](#), [\[Code\]](#), [\[Website\]](#).

Under Review: **Y. Zhang**, H. Li, Y. Yao, A. Chen, P.-Y. Chen, S. Zhang, M. Wang, S. Liu, “Visual Prompting Reimagined.

Under Review: H. Zhuang, **Y. Zhang***, K. Guo, J. Jia, G. Liu, S. Liu, X. Zhang, “UOE: Unlearning One Expert Is Enough For Mixture-of-experts LLMS, [\[PDF\]](#).

▷ **Thrust II. Trustworthy Machine Learning**

NeurIPS'24 D&B Track: **Y. Zhang**, C. Fan, Y. Zhang, Y. Yao, J. Jia, G. Zhang, G. Liu, R. Kompella, X. Liu, S. Liu, “UnlearnCanvas: A Stylized Image Dataset to Benchmark Machine Unlearning for Diffusion Models and Beyond”, [\[PDF\]](#), [\[Code\]](#), [\[Website\]](#), [\[Demo\]](#), [\[Dataset\]](#), [\[Benchmark\]](#).

NeurIPS'24: J. Jia, J. Liu, **Y. Zhang**, P. Ram, N. Baracaldo, S. Liu, “WAGLE: Strategic Weight Attribution for Effective and Modular Unlearning in Large Language Models”, [\[PDF\]](#), .

NeurIPS'24: Y. Zhang, X. Chen, J. Jia, **Y. Zhang**, C. Fan, J. Liu, M. Hong, K. Ding, S. Liu, “Defensive Unlearning with Adversarial Training for Robust Concept Erasure in Diffusion Models”, [\[PDF\]](#), [\[Code\]](#).

EMNLP'24 Main: J. Jia, **Y. Zhang**, Y. Zhang, J. Liu, B. Runwal, J. Diffenderfer, B. Kailkhura, S. Liu, “SOUL: Unlocking the Power of Second-Order Optimization for LLM Unlearning”, [\[PDF\]](#), [\[Code\]](#).

ECCV'24: Y. Zhang, J. Jia, X. Chen, A. Chen[‡], **Y. Zhang**, J. Liu, K. Ding, S. Liu, “To Generate or Not? Safety-Driven Unlearned Diffusion Models Are Still Easy To Generate Unsafe Images ... For Now”, The 18th European Conference on Computer Vision , [\[PDF\]](#), [\[Code\]](#), [\[Website\]](#).

ICLR'24 Spotlight: C. Fan[‡], J. Liu, **Y. Zhang**, E. Wong, D. Wei, S. Liu, “Salun: Empowering Machine Unlearning via Gradient-based Weight Saliency in Both Image Classification and Generation”, 12th International Conference on Learning Representations, [\[PDF\]](#), [\[Code\]](#).

ICLR'23: **Y. Zhang**, P. Sharma, P. Ram, M. Hong, K. R. Varshney, S. Liu, “What Is Missing in IRM Training and Evaluation? Challenges and Solutions”, 11th International Conference on Learning Representations, [\[PDF\]](#), [\[Code\]](#).

ICLR'23: B. Hou, **Y. Zhang**, J. Jia, G. Zhang, Y. Zhang, S. Liu, S. Chang, “TextGrad: Advancing Robustness Evaluation in NLP by Gradient-Driven Optimization”, 11th International Conference on Learning Representations, [\[PDF\]](#), [\[Code\]](#).

ICML'23: P. Khanduri, I. Tsaknakis, **Y. Zhang**, J. Liu, S. Liu, J. Zhang, M. Hong, “Linearly Constrained Bilevel Optimization: A Smoothed Implicit Gradient Approach”, 40th International Conference on Machine Learning, [\[PDF\]](#).

NeurIPS'22: **Y. Zhang**, G. Zhang*, Y. Zhang, W. Fan, Q. Li, S. Liu, S. Chang, “Fairness Reprogramming”, 36th Conference on Neural Information Processing Systems, [\[PDF\]](#), [\[Code\]](#), [\[Website\]](#).

UAI'22 Best Paper Runner-Up Award: G. Zhang, S. Lu, **Y. Zhang**, X. Chen, P.-Y. Chen, Q. Fan, L. Martie, M. Hong, S. Liu, “Distributed Adversarial Training to Robustify Deep Neural Networks at Scale”, 38th Conference on Uncertainty in Artificial Intelligence, [\[PDF\]](#), [\[Code\]](#), [\[Award\]](#).

ICML'22: **Y. Zhang**, G. Zhang, P. Khanduri, M. Hong, S. Chang, S. Liu, “Fast-BAT: Revisiting and Advancing Fast Adversarial Training through the Lens of Bi-level Optimization”, 39th International Conference on Machine Learning, [\[PDF\]](#), [\[Code\]](#), [\[Talk\]](#).

CVPR'22: **Y. Zhang***, T. Chen*, Z. Zhang*, S. Chang, S. Liu, Z. Wang, “Quarantine: Sparsity Can Uncover the Trojan Attack Trigger for Free”, 3Computer Vision and Pattern Recognition Conference 2022, [\[PDF\]](#), [\[Code\]](#), [\[Website\]](#).

Under Review: H. Wang, **Y. Zhang***, R. Bai, Y. Zhao, S. Liu, Z. Tu, “Edit Away and My Face Will not Stay: Personal Biometric Defense against Malicious Generative Editing, [\[PDF\]](#), [\[Code\]](#).

TUTORIALS AND INVITED TALKS

- **Tutorial** at AAAI 2024, Topic: Zeroth-Order Machine Learning: Fundamental Principles and Emerging Applications in Foundation Models, [\[Website\]](#) Feb. 2024
- **Tutorial** at AAAI 2023, Topic: Bi-level Optimization in Machine Learning: Foundations and Applications, [\[Website\]](#) Feb. 2023
- **Invited Talk** as Lecture Speaker, Department of Electrical and Computer Engineering, University of Minnesota (UMN) Apr. 2022
- **Invited Talk** at INFORMS Annual Conference, Department of Computer Science Oct. 2022
- **Invited Talk** as Lecture Speaker, Department of Computer Science, UCSB Apr. 2022

SERVICES

Conference Volunteer: AAAI'23, ICLR'23

Conference Reviewer: ICLR'22/23/24, NeurIPS'21/22/23/24, ICML'22/23/24, CVPR'23/24, ICCV'23, ECCV'24, AIS-TATS'22/23, UAI'22/23

Journal Reviewer: JMLR, IEEE TPAMI, IEEE T-IFS, TMLR

Workshop Student Chair: Workshop Series: AdvML: New Frontiers in Adversarial Machine Learning [\[ICML'22\]](#), [\[ICML'23\]](#), [\[NeurIPS'24\]](#).

MENTEES

Yuhao Sun (Undergraduate@USTC, PhD@THU) — [Submitting to CVPR'25]	May. 2024 - Current
Hanhui Wang (Master@USC) — [Submitting to CVPR'25]	May. 2024 - Current
Chongyu Fan (Undergraduate@HUST, PhD@MSU) — [[ICLR'24 Spotlight]]	May. 2023 - Current
Haomin Zhuang (PhD@Notre Dame) — [[CVPRW'23]] , [Submitting to ICLR'25]	Dec. 2022 - Current
Can Jin (Undergraduate@USTC, PhD@Rutgers) — [[AAAI'25]]	Aug. 2023 - Dec. 2023
Aochuan Chen (Undergraduate@THU, PhD@HKUST) — [[CVPR'23] , [ICLR'24]]	Oct. 2022 - Oct. 2023
Mohammad Jafari (Undergraduate, Sharif University of Technology) — [[ICASSP'24]]	May. 2023 - Oct. 2023

GRANT/FUNDING EXPERIENCE

Cisco Research Award (\$75,000), “Towards LifeLong LMM Agents in Embodied AI” 2024-2025

PI: Dr. Sijia Liu.

Role: Co-Proposal Writer

NAIRR Pilot Resource Awards (\$20,000), “Enhancing Large Language Model Unlearning across the Lifecycle” 2024-2025

PI: Dr. Sijia Liu.

Role: Co-Proposal Writer

