Xin Zou Ph.D. Student

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Education

School of Computer Science, Wuhan University — Wuhan, China
PhD's degree in Computer Science and Technology — 2021.09 - 2026.06 *(expected)*
- Advisor: Prof. Weiwei Liu

School of Computer Science, Wuhan University — Wuhan, China
Bachelor's degree in Software Engineering — 2017.09 - 2021.06

Research Interests

Statistical Learning Theory
- *PAC Learning*: A statistical framework that bounds the sample size needed to learn a hypothesis that, with high probability, has small error on unseen data.
- *Generalization Theory*: Studies why/when models trained on finite data perform well on new data, providing error bounds via capacity measures (e.g., VC/Rademacher) and algorithmic stability.

Out-of-distribution Learning
- *Out-of-Distribution Generalization*: Methods and theory to train predictors that stay accurate under distribution shift from source domains to unseen target domains.
- *Out-of-Distribution Detection*: Identifies inputs outside the training distribution and enables abstention/calibration or alternative handling.

Representation Learning
- *Contrastive Learning*: Representation learning that pulls semantically similar pairs together and pushes dissimilar pairs apart, producing invariant, transferable embeddings for downstream tasks.

Trustworthy Machine Learning
- *Adversarial Robustness*: Adversarial robustness studies how to make models keep correct predictions when inputs are deliberately and imperceptibly perturbed. It designs training and evaluation methods to reduce performance drops under such worst-case perturbations.

Publications

1. **Xin Zou***, Zhengyu Zhou*, Jingyuan Xu, Weiwei Liu. **A Boosting-Type Convergence Result for AdaBoost.MH with Factorized Multi-Class Classifiers.** In *Neural Information Processing Systems (NeurIPS)*, 2024. Solves a COLT 2014 open problem.
2. **Xin Zou**, Weiwei Liu. **Coverage-Guaranteed Prediction Sets for Out-of-Distribution Data.** In *Association for the Advancement of Artificial Intelligence (AAAI)*, 2024.
3. **Xin Zou**, Weiwei Liu. **On the Adversarial Robustness of Out-of-distribution Generalization Models.** In *Neural Information Processing Systems (NeurIPS)*, 2023.
4. **Xin Zou**, Weiwei Liu. **Generalization Bounds for Adversarial Contrastive Learning.** In *Journal of Machine Learning Research (JMLR)*, 2023.
5. Xinsong Ma, Jie Wu, **Xin Zou**, Weiwei Liu. **A Unified Decision Rule for Generalized Out-of-Distribution Detection.** In *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, 2025.
6. Xinsong Ma, **Xin Zou**, Weiwei Liu. **An Online Statistical Framework for Out-of-Distribution Detection.** In *International Conference on Machine Learning (ICML)*, 2025.
7. Xiyuan Li, **Xin Zou**, Weiwei Liu. **Residual Network with Self-Adaptive Time Step Size.** In *Pattern Recognition (PR)*, 2024.
8. Xinsong Ma, **Xin Zou**, Weiwei Liu. **A Provable Decision Rule for Out-of-Distribution Detection.** In *International Conference on Machine Learning (ICML)*, 2024.
9. Xiyuan Li, **Xin Zou**, Weiwei Liu. **Defending Against Adversarial Attacks via Neural Dynamic System.** In *Neural Information Processing Systems (NeurIPS)*, 2022.

Academic Services

Conference Reviewer

- Neural Information Processing Systems (NeurIPS, 2023-2025)
- International Conference on Machine Learning (ICML, 2023-2025)
- International Conference on Learning Representations (ICLR, 2024-2026)
- Artificial Intelligence and Statistics (AISTATS, 2025-2026)
- Association for the Advancement of Artificial Intelligence (AAAI, 2025-2026)
- International Joint Conferences on Artificial Intelligence (IJCAI, 2024)

Journal Reviewer

- IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- Transactions on Machine Learning Research (TMLR)
- Neurocomputing

Research Grants

The National Natural Science Foundation of China (NSFC)
Fundamental Research Project for Young Professional 2025.01 - 2026.12

The Youth Talents Support Project
Doctoral Student Special Program 2025.01 - 2026.06

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Awards and Honors

- **Tianyuan Dic Scholarship**, TYDIC 2025
- **Lei Jun Breakthrough Scholarship**, Wuhan University 2025
- **National Scholarship** (for Ph.D. students), Ministry of Education (China) 2024
- **"Huawei" Scholarship**, Huawei Technologies Co., Ltd. 2023
- **Outstanding Student Scholarship**, Wuhan University 2018-2020, 2023-2025
- **National Scholarship** (for undergraduate students), Ministry of Education (China) 2018