

Xi Xiao

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RESEARCH INTERESTS

- **Efficient Domain Adaptation for LLMs/MLLMs** (SC'25, ACM MM'25, COLM'25, EMNLP'25, CVPRW'25)
- **Image / Video Generation / Understanding** (NeurIPS'25, ICCV'25, ICASSP'25, ICMLW'25, WACV'26)

EDUCATION

- **University of Alabama at Birmingham** Jan 2024 – Present
Ph.D. Student in Computer Science
Advisors: [Dr. Tianyang Wang](#), [Dr. Min Xu](#)
Birmingham, United States
- **Sichuan University Jincheng College** Aug 2019 – Jun 2023
B.Eng. in Artificial Intelligence
Advisor: [Dr. Steve S. Chen](#)
Chengdu, China

PROFESSIONAL EXPERIENCE

- **Oak Ridge National Laboratory (ORNL)** [ORNL](#) May 2025 – Present
Research Intern (Advisor: [Dr. Xiao Wang](#)) Oak Ridge, United States
 - Conducted **pretraining of a tens-of-billions parameter foundation model (ORBIT-2)** on high-dimensional nonlinear climate datasets using the **Frontier exascale supercomputer**.
 - Optimized large-scale distributed training with **FSDP, DDP, and TILLING**, achieving significant improvements in training scalability and efficiency.
 - Applied **parameter-efficient fine-tuning (PEFT)** for downstream evaluation, enabling efficient adaptation of the foundation model to climate impact tasks.

PATENTS AND PUBLICATIONS

C=CONFERENCE, J=JOURNAL, P=PATENT, S=SUBMITTED

- [S.1] [Xi Xiao](#), Xingjian Li, Yunbei Zhang, Tianming Liu, Tianyang Wang, Xiao Wang, Min Xu. (2025). **Layer-Specific Prompt Interaction Discovery in Vision Transformers via Differentiable Search**. *Submitted to CVPR 2026*.
- [S.2] [Xi Xiao](#), Xingjian Li, Tianyang Wang, Guosheng Hu, Yunbei Zhang, Xiao Wang, Min Xu. (2025). **Prompting Vision Foundation Models with Cascaded Semantics**. *Submitted to AAAI 2026*.
- [S.3] [Xi Xiao](#), Yunbei Zhang, Hao Zhang, Pinxin Liu, Yuxiang Wei, Tianyang Wang. (2025). **Not All Directions Matter: Toward Structured and Task-Aware Low-Rank Tuning**. *Submitted to ICLR 2026*.
- [S.4] Mingqiao Mo*, [Xi Xiao](#)*, Yunbei Zhang, Pinxin Liu, Hao Zhang, Eric Hanchen Jiang, Hengjia Li, Yingrui Ji, Tianyang Wang, Hao Xu. (2025). **CaTeR: Structured Prompting and Temporal Distillation for Causal Video Reasoning with Frozen CLIP**. *Submitted to AAAI 2026*. (* Co-first author)
- [S.5] Chenrui Ma, [Xi Xiao](#), Tianyang Wang, Xiao Wang, Hao Zhang, Yanning Shen. (2025). **Stochastic Interpolants via Conditional Dependent Coupling**. *Submitted to ICLR 2026*.
- [S.5] Chenrui Ma, [Xi Xiao](#), Tianyang Wang, Xiao Wang, Hao Zhang, Yanning Shen. (2025). **CAD-VAE: Leveraging Correlation-Aware Latents for Comprehensive Fair Disentanglement**. *Submitted to AAAI 2026*.
- [S.7] [Xi Xiao](#), Aristeidis Tsaris, Anika Tabassum, John Lagergren, Larry M. York, Tianyang Wang, Xiao Wang. (2025). **FOCUS: Fused Observation of Channels for Unveiling Spectra**. *Submitted to WACV 2026*.
- [C.1] [Xi Xiao](#), Yunbei Zhang, Xingjian Li, Tianyang Wang, Yuxiang Wei, Xiao Wang, Jihun Hamm, Min Xu. (2025). **Visual Instance-aware Prompt Tuning**. *ACM MM, 2025*.
- [C.2] Hengjia Li*, Lifan Jiang*, [Xi Xiao](#)*, Tianyang Wang, Hongwei Yi, Boxi Wu, Deng Cai. (2025). **MagicID: Hybrid Preference Optimization for ID-Consistent and Dynamic-Preserved Video Customization**. *ICCV, 2025*. (* Co-first author)
- [C.3] Yuxiang Wei, Yanteng Zhang, [Xi Xiao](#), Tianyang Wang, Xiao Wang, Vince Calhoun. (2025). **MoRE-Brain: Routed Mixture of Experts for Interpretable and Generalizable Cross-Subject fMRI Visual Decoding**. *NeurIPS 2025*.
- [C.4] [Xi Xiao](#), Yunbei Zhang, Janet Wang, Lin Zhao, Yuxiang Wei, Hengjia Li, Yanshu Li, Xiao Wang, Swalpa Kumar Roy, Hao Xu, Tianyang Wang. (2024). **RoadBench: A Vision-Language Foundation Model and Benchmark for Road Damage Understanding**. *WACV 2026*. [[Round 1 Acceptance \(85/1329 ≈ 6.4%\)](#)].

- [C.5] **Xi Xiao**, Zhengji Li, Wentao Wang, Jiacheng Xie, Yuxiao Fan, Houjie Lin, Tianyang Wang, Min Xu. (2024). **TD-RD: A Top-Down Benchmark with Real-Time Framework for Road Damage Detection**. *ICASSP 2025*.
- [C.6] **Xi Xiao**, Yunbei Zhang, Thanh-Huy Nguyen, Ba-Thinh Lam, Janet Wang, Lin Zhao, Jihun Hamm, Tianyang Wang, Xingjian Li, Xiao Wang, Hao Xu, Tianming Liu, Min Xu. (2025). **Describe Anything in Medical Images**. *ICML Workshop, 2025*
- [C.7] **Xi Xiao**, Yunbei Zhang, Xingjian Li, Tianyang Wang, Jihun Hamm, Xiao Wang, Min Xu. (2025). **Visual Variational Autoencoder Prompt Tuning**. *CVPR Workshop, 2025*.
- [C.8] **Xi Xiao**, Wentao Wang, Jiacheng Xie, Lijing Zhu, Gaofei Chen, Zhengji Li, Tianyang Wang, Min Xu. (2024). **HGTDTP-DTA: Hybrid Graph-Transformer with Dynamic Prompt for Drug-Target Binding Affinity Prediction**. *ICONIP 2024*.
- [C.9] Wentao Wang*, **Xi Xiao***, Mingjie Liu, Tian Qing, Xuanyao Huang, Qizhen Lan, Swalpa Kumar Roy, Tianyang Wang. (2024). **Multi-dimension Transformer with Attention-based Filtering for Medical Image Segmentation**. *ICTAI 2024*. (* Co-first author)
- [C.10] Xiao Wang, Jong-Youl Choi, Takuya Kurihaya, Isaac Lyngaas, Hong-Jun Yoon, **Xi Xiao**, Ming Fan, Nasik Muhammad Nafis, Aristeidis Tsaris, Ashwin M. Aji, Maliha Hossain, Mohamed Wahib, Dali Wang, Peter Thornton, Prasanna Balaprakash, Moetasim Ashfaq, Dan Lu. (2025). **ORBIT-2: Scaling Exascale Vision Foundation Models for Weather and Climate Downscaling**. *International Conference for High Performance Computing, Networking, Storage, and Analysis (SC)*, 2025. **[Best Paper Finalist, ACM Gordon Bell Prize Finalist]**.
- [C.11] Hao Zhang, Bo Huang, Zhenjia Li, **Xi Xiao**, Hui Yi Leong, Zumeng Zhang, Xinwei Long, Tianyang Wang, Hao Xu. (2025). **Sensitivity-LoRA: Low-Load Sensitivity-Based Fine-Tuning for Large Language Models**. *Findings of EMNLP 2025*.
- [C.12] Yanshu Li, Hongyang He, Yi Cao, Qisen Cheng, Xiang Fu, **Xi Xiao**, Tianyang Wang, Ruixiang Tang. (2025). **M²IV: Towards Efficient and Fine-grained Multimodal In-Context Learning in Large Vision-Language Models**. *COLM*, 2025.
- [C.13] Yingrui Ji, **Xi Xiao**, Gaofei Chen, Hao Xu, Chenrui Ma, Lijing Zhu, Aokun Liang, Jiansheng Chen. (2025). **CIBR: Cross-modal Information Bottleneck Regularization for Robust CLIP Generalization**. *ICANN 2025*.
- [C.14] Jiacheng Xie, Yingrui Ji, Linghuan Zeng, **Xi Xiao**, Gaofei Chen, Lijing Zhu, Joyanta Jyoti Mondal, Jiansheng Chen. (2025). **E2CB2former: Effective and Explainable Transformer for CB2 Receptor Ligand Activity Prediction**. *IJCNN 2025*.
- [J.1] S. M. Fazle Rabby Labib, Joyanta Jyoti Mondal, Meem Arafat Manab, Sarfaraz Newaz, **Xi Xiao**. (2024). **Tailoring Adversarial Attacks on Deep Neural Networks for Targeted Class Manipulation Using DeepFool Algorithm**. *Nature Scientific Reports*.
- [J.2] Zhengji Li, Fazhan Xiong, Boyun Huang, Meihui Li, **Xi Xiao**, Yingrui Ji, Jiacheng Xie, Aokun Liang, Hao Xu. (2025). **MGD-YOLO: An Enhanced Road Defect Detection Algorithm Based on Multi-Scale Attention Feature Fusion**. *CMC-Computers Materials & Continua*.
- [P.1] Li Zhengji, **Xiao Xi**, Li Xinrui. (2023). **Road Surface Defect Detection Model Building Method, Detection Method, Storage Medium and Device**. China Patent No. 202211675037.5. Registration Date: 2022.12.26.
- [P.2] Li Zhengji, **Xiao Xi**, Li Xinrui. (2023). **A Targeted Forest Fire Detection Algorithm for YOLO-ForestFire**. (Patent Pending).
- [P.3] Li Zhengji, **Xiao Xi**, Li Xinrui. (2024). **A Pavement Disease Detection Method Based on CycleGAN and Improved YOLOv5**. (Patent Pending).
- [P.4] Zhou Li, **Xiao Xi**, Ge Yuque. (2022). **A Security Trolley for Hand Trajectory Violence Detection Based on AI Technology**. China Patent No. 20222219620.1. Granted: 2022.05.24.
- [P.5] Li Zhengji, Li Xinrui, Dai Changyi, **Xiao Xi**. (2022). **Forest Fire Detection Device and Its Collection Module**. China Patent No. 202222756942.5. Granted: 2022.10.19.

HONORS AND AWARDS

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| • ACM Gordon Bell Prize Finalist | 2025 |
| • SC Best Paper Finalist | 2025 |

ACADEMIC SERVICES

- **Conference Reviewer**
 - Association for the Advancement of Artificial Intelligence (AAAI), 2026
 - European Conference on Computer Vision (ECCV), 2024
 - ACM International Conference on Multimedia (ACM MM), 2025
 - International Conference on Neural Information Processing (ICONIP), 2024
 - International Joint Conference on Neural Networks (IJCNN), 2025
 - International Conference on Artificial Neural Networks (ICANN), 2025
- **Journal Reviewer**
 - IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)
 - npj Digital Medicine
- **Area Chair**
 - IEEE International Conference on Pattern Recognition and Artificial Intelligence (PRAI), 2022
- **Professional Memberships**
 - IEEE Student Member
 - APNNS Member