Xi Xiao

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Birmingham, AL - 35243, United States

RESEARCH INTERESTS

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

EDUCATION

- **University of Alabama at Birmingham** — *Jan 2024 – Present*
  Ph.D. Student in Computer Science — Birmingham, United States
  Advisors: Dr. Tianyang Wang, Dr. Min Xu

- **Sichuan University Jincheng College** — *Aug 2019 – Jun 2023*
  B.Eng. in Artificial Intelligence — Chengdu, China
  Advisor: Dr. Steve S. Chen

PROFESSIONAL EXPERIENCE

- **Oak Ridge National Laboratory (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). **DARTS-Prompt: Layer-Specific Prompt Interaction Discovery in Vision Transformers via Differentiable Search**. *Submitted to NeurIPS 2025*.

[S.2] **Xi Xiao**, Xingjian Li, Tianyang Wang, Guosheng Hu, Yunbei Zhang, Chenhui Ma, Runnin Jiang, Xi Li, Xiao Wang, Min Xu. (2025). **Prompting Vision Foundation Models with Cascaded Semantics**. *Submitted to AAAI 2026*.

[S.3] Mingqiao Mo*, **Xi Xiao***, Yunbei Zhang, Hao Zhang, Pinxin Liu, Eric Hanchen Jiang, Yuxiang Wei, Tianyang Wang, Chenrui Ma, Hao Xu. (2025). **The Rank You Need, Not the Rank You Have: Layer-wise Adaptation for Vision Transformers**. *Submitted to NeurIPS 2025*. (* Co-first author)

[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). **CAD-VAE: Leveraging Correlation-Aware Latents for Comprehensive Fair Disentanglement**. *Submitted to AAAI 2026*.

[S.6] Chenrui Ma, **Xi Xiao**, Tianyang Wang, Xiao Wang, Yanning Shen. (2025). **Beyond Editing Pairs: Fine-Grained Instructional Image Editing via Multi-Scale Learnable Regions**. *Submitted to AAAI 2026*.

[S.7] 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**. *Submitted to NeurIPS 2025*.

[S.8] Noah Wei, Haochen Wen, **Xi Xiao**, Quanjia Xiao, Tianyang Wang, Yifan Yang. (2025). **Augmenting Factual Knowledge in VLMs through Visual Post-Training with Web-Agent Reinforcement Learning**. *Submitted to AAAI 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] <u>Xi Xiao</u>, 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 $\approx$ 6.4%)].

[C.4] <u>Xi Xiao</u>, 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.5] <u>Xi Xiao</u>, 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.6] <u>Xi Xiao</u>, Yunbei Zhang, Xingjian Li, Tianyang Wang, Jihun Hamm, Xiao Wang, Min Xu. (2025). **Visual Variational Autoencoder Prompt Tuning**. *CVPR Workshop, 2025.*

[C.7] <u>Xi Xiao</u>, Wentao Wang, Jiacheng Xie, Lijing Zhu, Gaofei Chen, Zhengji Li, Tianyang Wang, Min Xu. (2024). **HGTDP-DTA: Hybrid Graph-Transformer with Dynamic Prompt for Drug-Target Binding Affinity Prediction**. *ICONIP 2024.*

[C.8] Wentao Wang*, <u>Xi Xiao*</u>, 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.9] Xiao Wang, Jong-Youl Choi, Takuya Kurihaya, Isaac Lyngaas, Hong-Jun Yoon, <u>Xi Xiao</u>, 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.10] Hao Zhang, Bo Huang, Zhenjia Li, <u>Xi Xiao</u>, 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.11] Yanshu Li, Hongyang He, Yi Cao, Qisen Cheng, Xiang Fu, <u>Xi Xiao</u>, Tianyang Wang, Ruixiang Tang. (2025). **M²IV: Towards Efficient and Fine-grained Multimodal In-Context Learning in Large Vision-Language Models**. *Conference on Language Modeling (COLM)*, 2025.

[C.12] Yingrui Ji, <u>Xi Xiao</u>, 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.13] Jiacheng Xie, Yingrui Ji, Linghuan Zeng, <u>Xi Xiao</u>, 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, <u>Xi Xiao</u>. (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, <u>Xi Xiao</u>, 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, <u>Xiao Xi</u>, 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, <u>Xiao Xi</u>, Li Xinrui. (2023). **A Targeted Forest Fire Detection Algorithm for YOLO-ForestFire**. (Patent Pending).

[P.3] Li Zhengji, <u>Xiao Xi</u>, Li Xinrui. (2024). **A Pavement Disease Detection Method Based on CycleGAN and Improved YOLOv5**. (Patent Pending).

[P.4] Zhou Li, <u>Xiao Xi</u>, 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, <u>Xiao Xi</u>. (2022). **Forest Fire Detection Device and Its Collection Module**. China Patent No. 202222756942.5. Granted: 2022.10.19.

HONORS AND AWARDS

- **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