

Wanghan Xu

Curriculum Vitae

September 14, 2001

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Education

- 2024.09- **PhD**, Information and Communication Technology, Shanghai Jiao Tong University. Research Present Topics: LLMs, Agents, [AI Scientists](#), Generative AI. Supervised by Prof. [Wanli Ouyang](#).
- 2020.09- **Bachelor** of Computer Science and Technology, Xi'an Jiaotong University.
- 2024.06 GPA: **100.01**(94.01+6)/100, Rank: **1/196**, Awarded as **top ten** outstanding student.

Key Contributor Publications

- 2025 **Wanghan Xu**, Yuhao Zhou, Yifan Zhou, Qinglong Cao, Shuo Li, Jia Bu ... (107 authors). Probing Scientific General Intelligence of LLMs with Scientist-Aligned Workflows [Link](#)
- 2025 Tao Han, **Wanghan Xu**, Junchao Gong, Xiaoyu Yue, Song Guo, Luping Zhou, Lei Bai. *InfGen: A Resolution-Agnostic Paradigm for Scalable Image Synthesis* (**ICCV 2025 Accept**) [Link](#)
- 2025 Xiangru Tang*, **Wanghan Xu***, Yujie Wang*, Zijie Guo*, Daniel Shao, Jiapeng Chen, Cixuan Zhang, Ziyi Wang, Lixin Zhang, Guancheng Wan, Wenlong Zhang, Lei Bai, Zhenfei Yin, Philip Torr, Hanrui Wang, Di Jin. *Eigen-1: Adaptive Multi-Agent Refinement with Monitor-Based RAG for Scientific Reasoning* (**ICLR 2026 Under Review**) [Link](#)
- 2025 Ming Hu, Chenglong Ma, Wei Li, **Wanghan Xu**, Jiamin Wu, Jucheng Hu, Tianbin Li, Guohang Zhuang, Jiaqi Liu ... (103 authors). *A survey of scientific large language models: From data foundations to agent frontiers* [Link](#)
- 2025 **Wanghan Xu**, Wenlong Zhang, Fenghua Ling, Ben Fei, Yusong Hu, Fangxuan Ren, Jintai Lin, Wanli Ouyang, Lei Bai. *Manalyzer: End-to-end Automated Meta-analysis with Multi-agent System* [Link](#)
- 2025 **Wanghan Xu**, Xiangyu Zhao, Yuhao Zhou, Xiaoyu Yue, Ben Fei, Fenghua Ling, Wenlong Zhang, Lei Bai. *EarthSE: A Benchmark Evaluating Earth Scientific Exploration Capability for Large Language Models* [Link](#)
- 2025 Xiangyu Zhao*, **Wanghan Xu***, Bo Liu, Yuhao Zhou, Fenghua Ling, Ben Fei, Xiaoyu Yue, Lei Bai, Wenlong Zhang, Xiao-Ming Wu. *MSEarth: A Benchmark for Multimodal Scientific Comprehension of Earth Science* [Link](#)
- 2025 **Wanghan Xu**, Xiaoyu Yue, Zidong Wang, Yao Teng, Wenlong Zhang, Xihui Liu, Luping Zhou, Wanli Ouyang, Lei Bai. *Exploring Representation-Aligned Latent Space for Better Generation* [Link](#)
- 2024 **Wanghan Xu**, Fenghua Ling, Wenlong Zhang, Tao Han, Hao Chen, Wanli Ouyang, Lei Bai. *Generalizing Weather Forecast to Fine-grained Temporal Scales via Physics-AI Hybrid Modeling* (**NeurIPS 2024 Accept**) [Link](#)
- 2024 **Wanghan Xu**, Kang Chen, Tao Han, Hao Chen, Wanli Ouyang, Lei Bai. *ExtremeCast: Boosting Extreme Value Prediction for Global Weather Forecast* [Link](#)
- 2024 Junchao Gong, Lei Bai, Peng Ye, **Wanghan Xu**, Na Liu, Jianhua Dai, Xiaokang Yang, Wanli Ouyang. *CasCast: Skillful High-resolution Precipitation Nowcasting via Cascaded Modelling* (**ICML 2024 Accept**) [Link](#)
- 2023 **Wanghan Xu**. *Is 3-(F)WL Enough to Distinguish All 3D Graphs?* [Link](#)

- 2023 **Wanghan Xu**, Bin Shi, Ao Liu, Jiqiang Zhang, Bo Dong. *GraphPub: Generation of Differential Privacy Graph with High Availability* [Link](#)
- 2023 **Wanghan Xu**, Bin Shi, Jiqiang Zhang, Zhiyuan Feng, Tianze Pan, Bo Dong. *MDP: Privacy-Preserving GNN Based on Matrix Decomposition and Differential Privacy* (**IEEE JCC 2023 Accept**) [Link](#)

Collaborative Publications

- 2025 *Omni-Weather: Unified Multimodal Foundation Model for Weather Generation and Understanding* [Link](#)
- 2025 *SciEvalKit: An Open-source Evaluation Toolkit for Scientific General Intelligence* [Link](#)
- 2025 *Earth-Agent: Unlocking the Full Landscape of Earth Observation with Agents* (**ICLR 2026 Under Review**) [Link](#)
- 2025 *Intern-S1: A Scientific Multimodal Foundation Model* [Link](#)
- 2025 *EarthLink: A Self-Evolving AI Agent for Climate Science* [Link](#)
- 2025 *Align-DA: Align Score-based Atmospheric Data Assimilation with Multiple Preferences* (**NeurIPS 2025 Accept**) [Link](#)
- 2025 *DAWP: A framework for global observation forecasting via Data Assimilation and Weather Prediction in satellite observation space* (**NeurIPS 2025 Accept**) [Link](#)
- 2025 *LO-SDA: Latent Optimization for Score-based Atmospheric Data Assimilation* [Link](#)
- 2024 *WEATHER-5K: A Large-scale Global Station Weather Dataset Towards Comprehensive Time-series Forecasting Benchmark* [Link](#)
- 2024 *CRA5: Extreme Compression of ERA5 for Portable Global Climate and Weather Research via an Efficient Variational Transformer* (**npj Under Review**) [Link](#)

Selected Ongoing Projects

- 2025 **Critic-R1: A Unified Reflective Critic Model in Complex Reasoning**
- Ongoing **Abstract:** We introduce Critic-R1, an RL-trained critic model that detects and corrects reasoning errors in LLMs. By learning to evaluate intermediate steps and generate targeted revisions, Critic-R1 reliably boosts complex problem-solving performance across diverse tasks.

Internship Experience

- 2023.07- Present **Shanghai AI Lab. Shanghai, China.**
Research Topics: AI for Science, Physics-informed ML, Generation
- 2022.03- 2023.06 **Shaanxi Provincial Key Laboratory of Tiandi Network Technology.**
Research Topics: Graph Neural Networks

Awards & Honors

- 2023 Top Ten Outstanding Student Models of Xi'an Jiaotong University
- 2023 American Mathematical Contest in Modeling (MCM/ICM) Finalist
- 2023 China Scientist Scholarship (20,000 ¥)
- 2022 National Scholarship
- 2022 RoboCup Robot World Cup China First Prize
- 2021 National Mathematical Contest in Modeling Shaanxi First Prize
- 2021 National College Mathematics Competition Shaanxi Province First Prize
- 2021 Xi'an Jiaotong University First Prize Scholarship

Recommendation Letter

- 2025 Prof. [Wanli Ouyang](#), Professor at the Chinese University of Hong Kong, Leading Scientist (领军科学家) at the Shanghai Artificial Intelligence Laboratory. [Link](#)

2023 Prof. [Qinghua Zheng](#), Academician of the Chinese Academy of Engineering (中国工程院院士),
President of Tongji University. [Link](#)