Xiyao Wang

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Education

University of Maryland, College Park, Maryland, United States 2022.8 – Present
Ph.D. in Department of Computer Science, expected in May 2026

University of Electronic Science and Technology of China, Chengdu, China 2015.9 – 2019.6
B.S. in Network Engineering

Research Interests

- *Modality alignment in Multimodel Large language models*
- *Reasoning and planning with Large language models*
- *World models for embodied AI*

Publications

* is Equal contribution.

Large (Multimodal) Language Models

- **Xiyao Wang**, Zhengyuan Yang, Chao Feng, Hongjin Lu, Linjie Li, Chung-Ching Lin, Kevin Lin, Furong Huang, Lijuan Wang. "SoTA with Less: MCTS-Guided Sample Selection for Data-Efficient Visual Reasoning Self-Improvement."
  https://arxiv.org/abs/2504.07934

- **Xiyao Wang**, Zhengyuan Yang, Linjie Li, Hongjin Lu, Yuancheng Xu, Chung-Ching Lin, Kevin Lin, Furong Huang, Lijuan Wang. "Scaling Inference-Time Search with Vision Value Model for Improved Visual Comprehension."
  https://arxiv.org/abs/2412.03704

- Tianyi Xiong*, **Xiyao Wang***, Dong Guo, Qinghao Ye, Haoqi Fan, Quanquan Gu, Heng Huang, Chunyuan Li. "LLaVA-Critic: Learning to Evaluate Multimodal Models."
  https://arxiv.org/abs/2410.02712

- **Xiyao Wang**, Linfeng Song, Ye Tian, Dian Yu, Baolin Peng, Haitao Mi, Furong Huang, Dong Yu. "Towards Self-Improvement of LLMs via MCTS: Leveraging Stepwise Knowledge with Curriculum Preference Learning."
  https://arxiv.org/abs/2410.06508

- **Xiyao Wang**, Yuhang Zhou, Xiaoyu Liu, Hongjin Lu, Feihong He, Yuancheng Xu, Taixi Lu, Gedas Bertasius, Mohit Bansal, Huaxiu Yao, Furong Huang. "Mementos: A Comprehensive Benchmark for Multimodal Large Language Model Reasoning over Image Sequence."
  The 62nd Annual Meeting of the Association for Computational Linguistics (ACL 2024)

- **Xiyao Wang**, Jiuhai Chen, Zhaoyang Wang, Yuhang Zhou, Yiyang Zhou, Huaxiu Yao, Tianyi Zhou, Tom Goldstein, Parminder Bhatia, Furong Huang, Cao Xiao. "Enhancing Visual-Language Modality Alignment in Large Vision Language Models via Self-Improvement."
  https://arxiv.org/abs/2405.15973

- Yiyang Zhou, Zhiyuan Fan, Dongjie Cheng, Sihan Yang, Zhaorun Chen, Chenhang Cui, **Xiyao Wang**, Yun Li, Linjun Zhang, Huaxiu Yao. "Calibrated Self-Rewarding Vision Language Models."

Neural Information Processing Systems (NeurIPS), 2024.

Embodied AI and Reinforcement Learning

- **Xiyao Wang**, Ruijie Zheng, Yanchao Sun, Ruonan Jia, Wichayaporn Wongkamjan, Huazhe Xu and Furong Huang. "COPlanner: Plan to Roll Out Conservatively but to Explore Optimistically for Model-Based RL."
  International Conference on Learning Representation (ICLR), 2024.

- **Xiyao Wang**, Wichayaporn Wongkamjan, Ruonan Jia and Furong Huang. "Live in the Moment: Learning Dynamics Model Adapted to Evolving Policy."
  International Conference on Machine Learning (ICML), 2023.
  *Abridged in ICML Decision Awareness in Reinforcement Learning Worshop 2022 (**Spotlight**).*

- Ruijie Zheng*, **Xiyao Wang***, Huazhe Xu, and Furong Huang. "Is Model Ensemble Necessary? Model-based RL via a Single Model with Lipschitz Regularized Value Function."
  International Conference on Learning Representation (ICLR), 2023.
  *Abridged in NeurIPS 2022 DRL Workshop (**Spotlight**).*

- Ruijie Zheng, Yongyuan Liang, **Xiyao Wang**, Shuang Ma, Hal Daumé III, Huazhe Xu, John Langford, Praveen Palanisamy, Kalyan Shankar Basu, Furong Huang. "`PREMIER-TACO` is a Few-Shot Policy Learner: Pretraining Multitask Representation via Temporal Action-Driven Contrastive Loss."
  International Conference on Machine Learning (ICML), 2024.

- Guowei Xu*, Ruijie Zheng*, Yongyuan Liang*, **Xiyao Wang**, Zhecheng Yuan, Tianying Ji, Yu Luo, Xiaoyu Liu, Jiaxin Yuan, Pu Hua, Shuzhen Li, Yanjie Ze, Hal Daumé III, Furong Huang, Huazhe Xu. "DrM: Mastering Visual Reinforcement Learning through Dormant Ratio Minimization."
  *International Conference on Learning Representation (ICLR), 2024 (**Spotlight**).*

- Ruijie Zheng, **Xiyao Wang**, Yanchao Sun, Shuang Ma, Jieyu Zhao, Huazhe Xu, Hal Daumé III, Furong Huang. "`TACO`: Temporal Latent Action-Driven Contrastive Loss for Visual Reinforcement Learning."
  Neural Information Processing Systems (NeurIPS), 2023.

- Yanchao Sun, Ruijie Zheng, **Xiyao Wang**, Andrew Cohen, and Furong Huang. "Transfer RL across Observation Representations via Model-Based Regularization."
  International Conference on Learning Representation (ICLR), 2022.

- Zeyuan Liu, Ziyu Huan, **Xiyao Wang**, Jiafei Lyu, Jian Tao, Xiu Li, Furong Huang, Huazhe Xu. "World Models with Hints of Large Language Models for Goal Achieving."
  https://arxiv.org/abs/2406.07381

Others

- Yuancheng Xu, Chenghao Deng, Yanchao Sun, Ruijie Zheng, **Xiyao Wang**, Jieyu Zhao, Furong Huang. "Equal Long-term Benefit Rate: Adapting Static Fairness Notions to Sequential Decision Making."
  International Conference on Machine Learning (ICML), 2024.

- Yankun Yu, Huan Liu, Minghan Fu, Jun Chen, **Xiyao Wang**, Keyan Wang "A Two-branch Neural Network for Non-homogeneous Dehazing via Ensemble Learning."
  New Trends in Image Restoration and Enhancement, CVPR workshop 2021.

PROFESSIONAL SERVICES

- Reviewer of International Conference on Learning Representations (ICLR), 2024
- Reviewer of Advances in Neural Information Processing Systems (NeurIPS), 2022, 2023, 2024
- Reviewer of International Conference on Machine Learning (ICML), 2022, 2023, 2024

Invited Talks

- Invited talk at Tsinghua University, 2022.

Skills

- Good at Python and Golang, have good machine learning and deep learning foundation, proficiency in using PyTorch and Jax, familiar with SQL and Spark.
- IELTS 7 (R:8 L:7 W:6 S:6)