

Mo Xu

Ph.D. Student in Computer Sciences, University of Wisconsin-Madison

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Research Interests

Embodied AI, Robot Learning, Reinforcement Learning, Dexterous Manipulation, Sim-to-Real Transfer, Vision-Language-Action Models, World Models

Education

Ph.D.	University of Wisconsin - Madison , Computer Sciences	Madison, WI 2024 – present
Master	University of Michigan - Ann Arbor , Electrical and Computer Engineering	Ann Arbor, MI 2022 – 2023

Research Experience

University of Wisconsin-Madison NSF HAND ERC , Bimanual Dexterous Manipulation for Real-World Jar Opening	Madison, WI 2025 – present
- Developed reinforcement learning policies for bimanual dexterous manipulation, coordinating a dual-arm, multi-fingered robot system for stable grasp acquisition and continuous jar twisting. - Designed a geometric grasp representation and a three-stage curriculum to support grasp acquisition and subsequent twisting, while enabling emergent finger-gait behaviors beyond hand kinematic limits. - Built massively parallel GPU simulation environments with mjlab and MuJoCo Warp, and trained PPO policies with progressive domain randomization for robust sim-to-real transfer. - Deployed the learned policies on a real dual-Franka platform with TESOLLO dexterous hands, integrating RGB-D object state estimation and real-time robot control.	
University of Wisconsin-Madison NSF HAND ERC , Non-Verbal Human Behavior Understanding for Interactive VLA Systems	Madison, WI 2026 – present
- Developing a System 1-System 2 architecture for non-verbal human-robot interaction, translating human behavior into semantic interpretations, robot instructions, and executable actions. - Designed a two-stage System 1 pipeline using Qwen vision-language models for interpreting human gestures and generating context-aware robot instructions. - Integrated $\pi 0.5$ VLA as System 2 to execute generated instructions through vision-conditioned robot actions.	
University of Wisconsin-Madison , Immersive Robotic Telepresence via Online 3D Gaussian Splatting	Madison, WI 2025 – 2026
- Developed an end-to-end immersive robotic telepresence system on a Stretch 2 robot, integrating online 3D reconstruction, rendering, and streaming for low-latency remote interaction. - Developed an online 3D Gaussian Splatting (3DGS) pipeline achieving high-fidelity rendering with over 4x speedup compared with the baseline pipeline.	

Publications

Toward Real-time High-fidelity Immersive Robotic Telepresence via Online 3D Gaussian Splatting

2026

Jingxin Du, **Mo Xu**, et al.

ieeexplore.ieee.org/abstract/document/11551306 (IEEE Robotics and Automation Letters (RA-L))

Learning Bimanual Dexterous Jar Opening with Emergent Finger Gaiting

2026

Mo Xu, et al.

(Under review at IEEE RA-L)

Industry Experience

ABB, Electronics Engineering Intern

Shanghai, China
June 2021 – Aug 2021

Technical Skills

Robot Learning: Reinforcement Learning, Sim-to-Real, Domain Randomization, Curriculum Learning, Dexterous Manipulation, VLM/VLA, World Model, TensorRT

Robotics & Simulation: MuJoCo/Mjlab, Isaac Sim/Isaac Lab, ROS/ROS 2, MoveIt, Franka Panda, Dexterous Hands, RGB-D Perception

Programming: Python, C/C++, PyTorch, TensorFlow, Docker, Linux, Git