

GAOTIAN WANG

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RESEARCH INTERESTS

Robust and **dexterous manipulation** via **RL and zero-shot sim-to-real**, **physics-aware world models**, **learning from human data**, and **agentic robotics** systems deployed on real robots, from low-cost mobile manipulators to **humanoids**.

EDUCATION

AUG 2022 - PRESENT	Rice University , <i>Houston, TX</i> Ph.D. in COMPUTER SCIENCE, expected 2027 Advisor: Prof. Kaiyu Hang
SEP 2018 - JUN 2022	University of Science and Technology of China , <i>Hefei, China</i> B.S. in PHOTOELECTRIC INFORMATION SCIENCE AND ENGINEERING

WORK EXPERIENCE

MAY 2026 - AUG 2026	NVIDIA Seattle Robotics Lab , <i>Seattle, WA</i> Research Intern ◇ Agentic Robotics: Developed a robotic agentic harness framework for robot-agnostic Code-as-Policy skill learning and VLM planning with foundation perception models for long-horizon tasks in unstructured environments ◇ Real-world deployment: End-to-end system integration on Jetson Thor and multi-robot collaboration between humanoid and mobile manipulators ◇ Skills: Code-as-Policy, VLM planning, cuRobo, nvblox, cuVSLAM
APR 2025 - PRESENT	XLeRobot (5.5k+ GitHub stars) Project owner and core developer ◇ Open-source hardware: Designed a \$660 dual-arm mobile home robot with a worldwide contributor community ◇ Software: LeRobot-based teleop, simulation, and VLA policies in real ◇ Skills: CAD design, LeRobot, ManiSkill, embedded motor control

RESEARCH EXPERIENCE

SEP 2022 - PRESENT	RobotII Lab , <i>Rice University</i> Advisor: Prof. Kaiyu Hang ◇ Robust manipulation under uncertainty: Caging in Time (IJRR) and Caging in Dreams: zero-shot sim-to-real pushing, dynamic ball balancing/catching, and deformable chain manipulation ◇ World models & sim-to-real RL: ManiDreams (IROS 2026), an open-source library for uncertainty-aware intuitive physics; extended to zero-shot dexterous reactive catching (RSS 2026) ◇ Learning from human data: EgoInfinity and RoboTok, internet-scale hand-object interaction data engines for video-to-action learning in dexterous manipulation ◇ Skills: RL, MPC, diffusion models, physics-based domain randomization
NOV 2021 - JUN 2022	AIoT Lab , <i>USTC</i> Advisor: Prof. Nikolaos M. Freris ◇ Kinodynamic planning and control for soft robotic arms (MuJoCo, RRT)
APR 2021 - SEP 2021	Reconfigurable Robotics Lab , <i>EPFL</i> Supervisor: Prof. Jamie Paik ◇ Physics simulation: Origami structure modeling and hysteresis simulation in Taichi; deployed on the Mercedes-Benz VISION AVTR
AUG 2020 - OCT 2021	Soft Robotics Lab , <i>USTC</i> Advisor: Prof. Xiaoping Chen ◇ Soft robotic arm modeling (COMSOL) and RL-based Q-learning control

SKILLS

Programming:	Python, C/C++, MATLAB, Linux, PyTorch, OpenCV, OMPL
Simulation:	ManiSkill, Isaac Sim/Lab, MuJoCo, Genesis, PyBullet, Taichi; implemented PBD and IPC solvers
Robotics:	ROS/ROS2, LeRobot, SE(3) kinematics, optimization, control theory, computer vision, RL
Hardware:	Unitree G1, Jetson, RealSense/OAK-D cameras, CAD modeling and printing

PUBLICATIONS

Under Review

I1. Caging in Dreams: Zero-shot Object Manipulation via Diffusion-based Task-Specific Intuitive Physics and In-Representation Domain Randomization

Gaotian Wang, Kejia Ren, Andrew S. Morgan, and Kaiyu Hang.

I2. EgoInfinity: A Web-Scale 4D Hand-Object Interaction Data Engine for Any-View Robot Retargeting and Video-to-Action Robot Learning

Gaotian Wang, Kejia Ren, Andrew S. Morgan, Yiting Chen, Howard Qian, Podshara Chanrungleekul, and Kaiyu Hang.

I3. RoboTok: An Internet-Scale Data Engine for Human Demonstration Video Retrieval and Dexterous Manipulation Learning

Howard Qian, Yiting Chen, Yunfei Xie, Kejia Ren, Podshara Chanrungleekul, **Gaotian Wang**, Bowen Wen, Chen Wei, and Kaiyu Hang.

Peer-Reviewed Journal Papers

J4. Caging in Time: A Framework for Robust Object Manipulation under Large Uncertainties

Gaotian Wang, Kejia Ren, Andrew S. Morgan, and Kaiyu Hang.

The International Journal of Robotics Research (IJRR), 2025.

J3. Object-Centric Kinodynamic Planning for Nonprehensile Robot Rearrangement Manipulation

Kejia Ren, **Gaotian Wang**, Andrew S. Morgan, Lydia E. Kavraki, and Kaiyu Hang.

IEEE Transactions on Robotics (T-RO), 2025.

J2. Collision-inclusive Manipulation Planning for Occluded Object Grasping via Compliant Robot Motions

Kejia Ren, **Gaotian Wang**, Andrew S. Morgan, and Kaiyu Hang.

IEEE Robotics and Automation Letters (RA-L), 2025.

J1. A Reinforcement Learning Method for Motion Control With Constraints on an HPN Arm

Yinghao Gan, Peijin Li, Hao Jiang, **Gaotian Wang**, Yusong Jin, Xiaoping Chen, and Jianmin Ji.

IEEE Robotics and Automation Letters (RA-L), 2022.

Peer-Reviewed Conference Papers

C8. ManiDreams: An Open-Source Library for Robust Object Manipulation via Uncertainty-aware Task-specific Intuitive Physics

Gaotian Wang, Kejia Ren, Andrew S. Morgan, and Kaiyu Hang.

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2026.

C7. Zero-Shot Sim-to-Real Robot Learning: A Dexterous Manipulation Study on Reactive Catching

Kejia Ren, **Gaotian Wang**, Andrew S. Morgan, and Kaiyu Hang.

Robotics: Science and Systems (RSS), 2026.

C6. rt-RISeg: Real-Time Model-Free Robot Interactive Segmentation for Active Instance-Level Object Understanding

Howard Qian, Yiting Chen, **Gaotian Wang**, Podshara Chanrungleekul, and Kaiyu Hang.

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2025.

C5. UNO Push: Unified Nonprehensile Object Pushing via Non-Parametric Estimation and MPC

Gaotian Wang, Kejia Ren, and Kaiyu Hang.

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2024.

C4. RISeg: Robot Interactive Object Segmentation via Body Frame-Invariant Features

Howard Qian, Yangxiao Lu, Kejia Ren, **Gaotian Wang**, Ninad Khargonkar, Yu Xiang, and Kaiyu Hang.

IEEE International Conference on Robotics and Automation (ICRA), 2024.

C3. Kinematic Modeling and Control of a Soft Robotic Arm with Non-constant Curvature Deformation

Zhanchi Wang, **Gaotian Wang**, Xiaoping Chen, and Nikolaos M. Freris.

IEEE International Conference on Robotics and Automation (ICRA), 2024.

C2. Dynamic Modeling and Control of a Soft Robotic Arm Using a Piecewise Universal Joint Model

Zhanchi Wang, **Gaotian Wang**, Xiaoping Chen, and Nikolaos M. Freris.

IEEE International Conference on Robotics and Biomimetics (ROBIO), 2023.

C1. A Q-Learning Control Method for a Soft Robotic Arm Utilizing Training Data from a Rough Simulator

Peijin Li, **Gaotian Wang**, Hao Jiang, Yusong Jin, Yinghao Gan, Xiaoping Chen, and Jianmin Ji.

IEEE International Conference on Robotics and Biomimetics (ROBIO), 2021.

ACADEMIC SERVICE

Organizer: [Workshop on Agentic Robotics](#), CoRL 2026
Reviewer: T-RO, RA-L, Nature Communications, CoRL 2026, ICRA 2024/2025, IROS 2023/2025

TEACHING

FALL 2023	TA, Algorithmic Robotics (COMP/ELEC/MECH 450/550), Rice University
SPRING 2023	TA, Deep Learning for Vision & Language (COMP 646), Rice University
2020 - 2022	In-lab TA, College Physics Comprehensive Experimentation, USTC