Peilin **Wu**

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Education

SJTU (Shanghai Jiao Tong University) *Shanghai, China*

B.E. in Computer Science and Technology *Sep. 2022 - Present*

- IEEE Honors Class
- GPA: 90.6/100 (3.93/4.3)
- Relevant Coursework: Mathematics Analysis (90/100) · Linear Algebra (94/100) · Probability and Statistics (94/100) · Linear and Convex Optimization (96/100) · Information Theory (93/100) · Discrete Mathematics (91/100) · Robotics (96/100) · Operation System (95/100)

Publications

4D Latent World Model for Robot Planning

Zhiyi Li, **Peilin Wu**, Xiaoshen Han, Yilun Du *Jul. 2025 - Oct. 2025*

Preprint

- A 4D latent world model that predicts future 3D structures conditioned on current observations and text goal, achieving high visual quality, physical consistency, and robust viewpoint generalization.
- A planning framework that leverages our model's detailed 3D predictions as geometrically rich goals for an inverse dynamics controller, enabling precise and spatially aware manipulation.

LoopSR: Looping Sim-and-Real for Lifelong Policy Adaptation of Legged Robots

Peilin Wu, Weiji Xie, Jiahang Cao, Hang Lai, Weinan Zhang *Jun. 2024 - Mar. 2025*

***IROS*, 2025**

- Modeled the lifelong learning problem and proposed methods accordingly to get a simulated reconstruction of the real world.
- Designed a lifelong policy adaptation framework that enhanced the performance by at least 30% in the most difficult cases compared with sim-to-real transfer baselines and successfully handled problems like catastrophic forgetting.

Bridging the Sim-to-Real Gap from the Information Bottleneck Perspective

Haoran He, **Peilin Wu**, Chenjia Bai, Hang Lai, Lingxiao Wang, Ling Pan, Xiaolin Hu, Weinan Zhang *Apr. - Jun. 2024*

***CoRL* (Oral), 2024**

- Provided a theoretical analysis to model the sim-to-real gap concerning privileged information and historical trajectories.
- Proposed an efficient and effective sim-to-real transfer method inspired by information bottleneck, outperforming existing baselines (DreamWaQ, RMA, etc.) for about 10% in simulated RL tasks and real-world quadruped locomotion.

Reasearch Experience

Harvard University *Boston, U.S.*

Research Intern at Harvard, Advised by Prof. Yilun Du *Jul. 2025 - Present*

Research Topic: Diffusion-based World Models, Multimodal Perception, 3D Representation

Shanghai AI Lab *Shanghai, China*

Research Assistant at Embodied AI Center, Advised by Dr. Jingbo Wang *Mar. 2025 - Present*

Research Topic: Human Motion Generation, Humanoid Whole Body Control

Shanghai Jiao Tong University *Shanghai, China*

Research Assistant at APEX Lab, Advised by Prof. Weinan Zhang *Sep. 2023 - Present*

Research Topic: Reinforcement Learning, Legged Robots, Continual Learning

Shanghai Jiao Tong University *Shanghai, China*

Research Assistant at MAGIC Lab, Advised by Prof. Siheng Chen *Jul. 2023 - Mar. 2024*

Research Topic: Drone System, Collaborative Communication

Highlighted Projects

World Model for Robot Manipulation with Tactile Information *Boston, U.S.*

Research Assistant at Embodied AI Center, Advised by Dr. Jingbo Wang *July. 2025 - Present*

- Construct a multimodal world model to generate both visual and tactile information through diffusion-based techniques.
- Develop policies for contact-rich robot manipulation tasks under the supervision of the world model.

Bridging the Gap between Human Motion Generation and Humanoid Control *Shanghai, China*

Research Assistant at Embodied AI Center, Advised by Dr. Jingbo Wang *Mar. 2025 - Present*

- Established a thorough pipeline from text/goal-conditioned motion generation to low-level locomotion of humanoid robots (Unitree G1).
- Implementing RL-based fine-tuning techniques to get a robust system that can continuously improve.

Drone System Construct and Communication for UAV swarm

Shanghai, China

Research Assistant at MAGIC Lab, Advised by Prof. Siheng Chen — *Aug. 2023 - Mar. 2024*

- Constructed a drone system based on ROS, carrying a GPS sensor and USB camera, used to collect data for autonomous driving datasets.
- Implemented the communication for UAV swarm based on TCP/UDP, preparing for future research on collaborative communication.

Vision System for 6-DoF Robot Arm

Shenzhen, China

Team Member at SJTU RoboMaster Team in RoboMaster Competition 2023 — *Feb. - Aug. 2023*

- Designed the algorithm to identify the camera pose and desired end effector pose from RGB image.
- Constructed a thorough pipeline to connect the sensor, PC, and lower computer based on ROS and serial communication.

Honors & Awards

2023 **1st Prize**, 1st in 32 teams, China University Robot Competition RoboMaster

2022-2024 **Zhiyuan Honorary Scholarship**, top 5 % students in SJTU

2023, 2024 **University Scholarship**, top 5 % students in SJTU

Skills

Programming Python, C/C++, LaTeX, MATLAB, HTML, CSS, JavaScript

Frameworks PyTorch, Tensorflow, NumPy, OpenCV, ROS, Flask

Simulators IsaacGym, IsaacLab, ManiSkill (Sapien)

Robots Unitree A1, Unitree Go2, Unitree G1, Franka Panda (+ self-built drones and robot arms)

Language Chinese, English (TOEFL 112, GRE 328+3.0)