Yiqi Lyu

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Research Interests

Vision-language-action models, AI embodiment, multi-modal perception, meta-learning, multi-agent learning

Education

Northwestern University Expected Jun 2029
Ph.D. in Robotics
Curriculum: Generative Deep Models, Agent AI

Carnegie Mellon University May 2023
Master of Science in Mechanical Engineering
Curriculum: Machine Learning, Modern Control Theory and Design, Robotic Dynamic and Analysis

Huazhong University of Science and Technology Jun 2019
Bachelor of Engineering in Mechanical Design, Manufacturing and Automationg

Experience

Safe AI Lab, Carnegie Mellon University – Pittsburgh, PA May 2023 – Jul 2024
Research intern, advisor: Ding Zhao
Topic: Generalizable robot control

WIPM, Chinese Academy of Science – Wuhan, China Aug 2020 – Jan 2021
Research intern, advisor: Bosong Kang
Topic: High-precision quartz-glass micro-cavity machining

Publications

CrashAgent: Crash Scenario Generation via Multi-modal Reasoning
Miao Li, Wenhao Ding, Haohong Lin, **Yiqi Lyu**, Yihang Yao, Yuyou Zhang, Ding Zhao
arxiv. Under submission

Dynamics as Prompts: In-Context Learning for Sim-to-Real System Identifications
Xilun Zhang*, Shiqi Liu*, Peide Huang, William Han, **Yiqi Lyu**, Mengdi Xu, Ding Zhao
2025 IEEE Robotics and Automation Letters (RA-L)

Projects

Skill-based Generalizable Robot Manipulation Sep 2023 – Feb 2024

- Collected expert data of robot arms on robosuite simulator with path planning algorithms
- Achieved 98% success rate with a skill-based imitation learning policy, which is generalizable to randomly initialized scenarios with task-specific skills inferred by energy function
- Deployed model in real-world dynamic environments with Kinova Gen3 and Ufactory xArm7, improving safety via object avoidance in human interrupting scenarios

Generalizable Beam Walking for Legged Robots with Reinforcement Learning Oct 2023 – Dec 2023

- Developed a reinforcement-learning framework enabling a quadruped robot to perform robust, vision-guided beam walking, achieving strong generalization to varied beam widths and initial poses.

Autonomous Driving on Carla Simulator Apr 2023 – May 2023

- Detected objects on roads in adversarial environments with YOLO-v5 and Faster-RCNN
- Reduced collision rate by 20% with SAC algorithm in safety-critical scenarios of AV

Skills

Technologies: Robotics, Deep Learning, Control, Optimization, Computer Vision, CAD/CAE, PLC, 3D printing
Tools: PyTorch, Scikit-learn, Numpy, OpenCV, ROS, Mujoco, PyBullet, Ansys, Solidworks, Arduino, Raspberry Pi
Programing: Python, C++, MATLAB, Latex