YITONG LI

liyitong.thu@gmail.com
(+86) 151-691-61680

EDUCATION

Tsinghua University, China *Sept. 2021 - Jun. 2025*
Mathematics and Physics + Measurement Control Technology and Instruments
Total GPA: 3.90
Related Courses: Probability and Stochastic Processes, Statistical Inference, Numerical Analysis, Operations Research for Deterministic Models, Convex Optimization

RESEARCH EXPERIENCE

Broadcasting Support Relations Recursively from Local Dynamics for Object Retrieval in Clutters
–RSS 2024, co-first-author
–Advised by Prof. Hao Dong, Peking University
In this paper, we propose a method to retrieve a target object safely in a group of cluttered objects (without causing any damage to other objects, such as collision or falling). To achieve this goal, it is necessary to analyse support relations between objects in the clutter and retrieve objects in a specific order from the top to the target. We propose *broadcast* mechanism, where we use *Direction Proposal Module* and *Dynamic Predictor Module* to find out which objects are supported by the target among its adjacent objects. The supported objects can be regarded as child node of the target object. We exploit this mechanism recursively, from the target to its child nodes, to figure out all support relations related to our goal, then a retrieval chain can be easily derived. Addition to that, we train *manipulation affordance* to propose grasp point and pose to manipulate objects.

UniGarment: A Unified Simulation and Benchmark for Garment Manipulation
–ICRA 2025 Workshop, co-first-author
–Advised by Prof. Hao Dong, Peking University
In this project, We present UniGarment, a benchmark designed for garment manipulation within realistic 3D indoor scenes. Our benchmark encompasses a diverse range of garment types, robotic systems and manipulators including dexterous hands. The multitude of tasks included in the benchmark enables further exploration of the interactions between garments, deformable objects, rigid bodies, fluids, and avatars.

Zero-Shot Sim2Real through Rapid Motor Adaptation for Drones based on Reinforcement Learning
–Responsible for Reinforcement Learning
–Advised by Prof. Yu Wang, Tsinghua University
In this project, we use Rapid Motor Adaptation (RMA) to adapt to various configurations of drones, including mass, arm-length, moment of inertia, motor constant and so on, which range from 0.1 at least to 5 at most relative to standard value. We obtain configurations from simulation environment and encode them as environment prior feature. Then we embed it with observation to train a policy with environment prior information. Because environment information is inaccessible in realworld, we use the command-state history to regress the environment prior feature directly and regress it realtime when deploying. The main policy is trained using PPO.

RESEARCH PROPOSAL

I am interested in the intersection of 3d vision, generative model and robot learning. In previous projects, I have in-depth research in the topic of physics intuition and imitation learning, where I find my great passion. In the further, I want to continue my research career in the field of machine learning and am open to various downstream applications such as content generation and embodied intelligence.

SKILLS

Programming: Python(Pytorch), Matlab, C, C++
Simulation Platform: IsaacSim, Sapien, Robosuite