Ziyu Zhu

✉ 2200012964@stu.pku.edu.cn   ⬤ Ziyu Zhu

Research Interests

My research is driven by the goal of enabling robots to perform dextrous tasks with adaptability, generalizability and safety, focusing on vision based methods, like representation learning, as a toolbox for solving such problems.

Education

Peking University
BS in Computer Science

Sept 2022 –
June 2026 expected

- GPA: 3.65/4.0

Experience

Hyperplane Lab, Center on Frontiers of Computing Studies, Peking University

Research Intern - Mentor: *Prof.* Hao Dong and *Dr.* Ruihai Wu

- Explore dexterous robot manipulation upon deformable objects, as well as the interaction between objects.
- Explore the generalization across deformable objects of different categories and states.

Publications

Garmentlab: A Unified Simulation and Benchmark for Garment Manipulation
Haoran Lu*, Ruihai Wu*, Yitong Li*, Sijie Li, ***Ziyu Zhu***, Chuanruo Ning,
Yan Shen, Longzan Luo, Yuanpei Chen, Hao Dong
NeurIPS 2024.   Garmentlab.github.io 🔗

- We propose GarmentLab Environment, a realistic and rich environment for garment manipulation.
- We propose the first real-world garment manipulation benchmark that can be reproduced internationally.
- We integrate different sim2real methods and teleoperation into GarmentLab.

Point-Level Visual Affordance Guided Retrieval and Adaptation for Cluttered Garments Manipulation
Ruihai Wu*, ***Ziyu Zhu****, Yuran Wang*, Yue Chen, Jiarui Wang, Hao Dong
Under review CVPR 2025.   A private copy is attached, approved by the mentor.

- We propose to study the novel task of cluttered garments manipulation and build the pioneering environment.
- We introduce point-level affordance learning for cluttered garments manipulation.
- We further develop the adaptation module guided by affordance to efficiently adapt the cluttered garments.

DexGarmentLab: Dexterous Garment Manipulation Environment with Generalizable Policy
Yuran Wang*, Ruihai Wu*, Yue Chen*, ***Ziyu Zhu***, et al.
To submit to RSS 2025.

- We introduce a realistic simulation environment for bimanual dexterous garment manipulation, based on which we propose a new benchmark for evaluating a large variety of such tasks.
- We design an efficient data collection pipeline that generates diverse demonstration data.
- We present SADP, a novel policy framework that uses category-level dense visual correspondences to enable the manipulation of diverse garments with few-shot demonstrations.

Explore Modeling of Object Interaction Problems
Planned project with preliminary trials, led by me and targeted at NeurIPS 2025.

- We propose to study complex tasks involving multi-object interactions, especially rigid and deformable objects.
- We propose a new approach to model object interaction problems, guided by the task-oriented correspondence between relevant objects.

Skills

Languages: C++, C, Python, Linux, CUDA C/C++

Deep Learning Frameworks: Pytorch, Numpy

Simulator: IsaacSim