Haoran Lu

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EDUCATION BACKGROUND

- **Peking University**, Beijing, China

  Bachelor of Science, Computer Science and Technology   Sept 2021 - Present (expected July 2025)
  - Advisor: Prof. Hao Dong
  - Lab: Hyperplane Lab, Center on Frontiers of Computing Studies
  - GPA:3.685/4.0
  - **Top 25% in the grade**
- **Peking University**, Beijing, China

  Bachelor of Economic   Sept 2022 - Present (expected July 2025)

PUBLICATIONS (* denotes equal contribution;)

- **GarmentLab: A Unified Simulation and Benchmark for Garment Manipulation**

  Haoran Lu*, Ruihai Wu*, Yitong Li*, Zijie Zhang, Ziyu Zhu, Longzan Long, Chuanruo Ning, Yan Shen, Hao Dong

  NeurIPS 2024
- **UniGarmentManip:Learning Dense Visual Correspondence for Category-level Garment Manipulation**

  Ruihai Wu*, **Haoran Lu***, Yiyan Wang, Yubo Wang, Hao Dong

  CVPR 2024
- **Broadcasting Support Relations from Local Dynamics for Object Retrieval in Clutters**

  Yitong Li*, Ruihai Wu*, **Haoran Lu**, Chuanruo Ning, Yan Shen, Guanqi Zhan, Hao Dong

  RSS 2024(Oral)
- **Where2Explore: Few-shot Affordance Learning for Unseen Novel Categories of Articulated Objects**

  Chuanruo Ning*, Ruihai Wu*, **Haoran Lu**, Kaichun Mo, Hao Dong

  NeurIPS 2023
- **UniGarment: A Unified Simulation and Benchmark for Garment Manipulation(Extended Abstract)**

  Haoran Lu*,Yitong Li*, Ruihai Wu*, Chuanruo Ning, Yan Shen, Hao Dong

  ICRA 2024 Representing and Manipulating Deformable Objects Workshop(Oral)
- **Neural Dynamics Augmented Diffusion Policy**

  Ruihai Wu*, Mingtong Zhang*, Haozhe Chen*, **Haoran Lu**, Yitong Li, Yunzhu Li

  ICRA 2025 under review
- **ImageManip: Image-based Robotic Manipulation with Affordance-guided Next View Selection**

  Xiaoqi Li, Yanzi Wang, Yan Zhao, Yaroslav Ponomarenko, Qianxu Wang, **Haoran Lu** , Boshi An, Jiaming Liu, Hao Dong

  ICRA 2025 under review
- **BiAssemble:Learning Collaborative Affordance for Bimanual Geometric Assembly**

  Yan Shen, Ruihai Wu, yubin Ke, Xinyuan Song, Zeyi Li, Xiaoqi Li, Hongwei Fan, **Haoran Lu**, Hao Dong

  ICLR 2025 under review

Selected Publication

- **GarmentLab: A Unified Simulation and Benchmark for Garment Manipulation**
- ➤ We propose GarmentLab Environment, a realistic and rich environment for garment manipulation, featuring diverse simulation methods, assets, object physics and multi-material interactions
- ➤ We propose GarmentLab Benchmark, benchmarking a large variety of garment manipulation tasks, and providing the **first real-world garment manipulation benchmark** that can be reproduced internationally
- ➤ We integrate different sim2real methods and **teleoperation** into GarmentLab, providing solutions to narrowing the sim2real and further facilitating the real-world applications.

- **UniGarmentManip:Learning Dense Visual Correspondence for Category-level Garment Manipulation**
  - ➢ We propose the first cross-object garment manipulation universal operation strategy.
  - ➢ We propose to learn category-level dense visual correspondence to reflect the topological and functional correspondence across garments in different styles or deformations,
  - ➢ We propose an unified representation that facilitates manipulating diverse unseen garments in multiple tasks with one or few-shot demonstrations.

Service

- ➢ NeurIPS 2024 reviewer
- ➢ ICLR 2025 reviewer
- ➢ AISTATS 2025 reviewer

Past Research Experience

- **Summer Intern of CCVL (Computational Cognition, Vision, and Learning) research group**   2024.7 - present
  - Advisor: Prof. Alan L. Yuille and Ph.D candidate Jieneng Chen
  - Johns Hopkins University
  - Project：**VisualGraph: Towards more controllable and interpretable visual representation Using LLM**
  - ➢ Using MLLM to generate hierarchy graph representation of Image
  - ➢ Exploring VLM and LLM capability on Image information Retrieval and Understanding
  - ➢ Fine-tune VLM and LLM using RL to enhance model's understanding of object structure
- **Summer Intern of RoboPIL research lab**   2024.6 - present
  - Advisor: Yunzhu Li
  - Columbia University
  - Project：**DynRotate: Tactile-Visual Fusion for Dynamic Object Reorientation via Collision**
  - ➢ Using a Dynamic Model to Predict Object Behavior After Collision with Tactile Feedback
  - ➢ To establish a visual-tactile simulation system and a teleoperation system for the purpose of collecting data.
  - ➢ Using Motion Planning to Plan Robot Actions for Object Reorientation
- **National Basic Science Talent Cultivation Plan**   2022.9 - present
  - Top 10% in EECS Department
- **Research Assistant (RA) in - Center on Frontiers of Computing Studies**   2023.6 - present
  - Advisor: Prof. Hao Dong
  - Lab: Hyperplane Lab, Center on Frontiers of Computing Studies
- **Research Assistant (RA) in - The School of Artificial Intelligence of PKU**   2023.1 - 2023.6
  - Advisor: Prof. BaoQuan Chen
  - Project on simulation of fluid and garment

SKILLS

- **Language**: Chinese (native)   English (TOEFL 105)
- **Deep Learning Frameworks**: PyTorch (Proficient), TensorFlow (Proficient)
- **Simulator**: Proficient in simulator establishing and using including IsaacSim, IsaacGym, Sapien, Mujoco
- **RealWorld Robot**:Proficient in Operating Real-World Robotic Arms Including Franka, UR, Shadow Hand, and Xarm

HONORS AND AWARDS

- Community Service Award, *Peking University*
- Research Excellence Award, *Peking University*
- Academic Excellence Award, *Peking University*
- Peking University Scholarship Third Prize, *Peking University*
- UGVR candidate, Stanford University