# Haoyu Xiong

haoyu-x.github.io

Email : haoyux@andrew.cmu.edu
Mobile : 412-889-7433


## Education

- **Carnegie Mellon University** — Pittsburgh, PA, U.S.A
  *M.S. in Robotics; research-based program advised by Prof. Deepak Pathak* — *Sep. 2022 – Aug. 2024*
- **University of California, Berkeley** — Berkeley, CA, U.S.A.
  *Visiting student in EECS* — *Jan. 2020 – May. 2020*
- **Tianjin University** — Tianjin, China
  *B.E. in Biomedical Engineering* — *Sep. 2017 – Jun. 2021*

## Research Interests

- (Real-world) (Mobile) Manipulation, Learning from Internet/ Human Videos, Sim2real and Real2sim.

## Publication

- **Self-Tuning Open-World Mobile Manipulation**:
  **Haoyu Xiong**, Russell Mendonca, Kenny Shaw, Deepak Pathak.
  *Under review IEEE Robotics and Automation Letters,* ***RA-L 2024***. [door-open.github.io]
- **RoboTube: Learning Household Manipulation from Human Videos with Simulated Twin Environments**:
  **Haoyu Xiong**, Haoyuan Fu, Jieyi Zhang, Chen Bao, Qiang Zhang, Wenqiang Xu,
  Huazhe Xu, Animesh Garg, Cewu Lu.
  **Oral (6.5%)**, Conference on Robot Learning , **CoRL 2022**. [Video] [OpenReview] [robotube.org]
- **Learning By Watching: Physical Imitation of Manipulation skills from Human Videos**:
  **Haoyu Xiong**, Quanzhou Li, Yun-Chun Chen, Homanga Bharadhwaj, Samarth Sinha, Animesh Garg.
  *IEEE/RSJ International Conference on Intelligent Robots and Systems,* ***IROS 2021***.
  **Spotlight Talk,** *Workshop on Visual Learning and Reasoning for Robotics,* ***RSS 2021***. [pair.toronto.edu/lbw-kp/]
- **SPIN: Simultaneous Perception, Interaction and Navigation**:
  Shagun Uppal, Ananye Agarwal, **Haoyu Xiong**, Kenneth Shaw, Deepak Pathak.
  *Anonymous Submission.* [spin-robot.github.io]

## Experience

- **The Robotics Institute, Carnegie Mellon University** — Pittsburgh, PA, U.S.A.
  *Research Assistant with Deepak Pathak* — *Nov. 2022 – Present*
  - **Open-World Mobile Manipulation Systems**:
    Research on online RL adaptation for robotic agents in the open world.
    Mobile manipulation robot systems development and deployment in the real world.
  - **RL Sim2Real**:
    Research on sim2real RL for mobile manipulation with active perception.
- **University of Toronto & Vector Institute** — Toronto, ON, Canada (remotely)
  *Visiting Student Researcher with Animesh Garg* — *Mar. 2020 – Jul. 2022*
  - **Learning Skills from Human Videos**:
    Research on human-to-robot skills transfer with imitation learning.
- **Stanford Vision & Learning Lab, Stanford University** — Palo Alto, CA, U.S.A. (remotely)
  *Visiting Student Researcher with Danfei Xu and Ajay Mandlekar* — *Nov. 2020 – Jul. 2021*
  - **Foundation Models for Robot Learning**:
    Research on policy transfer in learning from human demonstrations with vision-language models.
- **Shanghai Qizhi Institute** — Shanghai, China
  *Full-time Researcher with Cewu Lu and Huazhe Xu* — *Feb. 2021 – Jul. 2022*
  - **Real2Sim, Learning from Human Videos**:
    Benchmarking learning from human videos. Large-scale video dataset construction and training.
    Paired digital twin simulation for robotics.

## Honors and Awards

- UC Berkeley Scholarship, SAF Merit - 2020
- Outstanding Student Award in Tianjin University - 2018
- National Undergraduate Student Research Fund - 2018
- First Prize in National Mathematics Competition, Tianjin division - 2018

## Invited Talks

- Learning Mobile Manipulation in the Open World
  *Stanford Interactive Perception and Robot Learning lab, Dec. 2023.*
- RoboTube: Learning from Human Videos and Real2Sim
  *Stanford Vision and Learning lab, Dec. 2022; CoRL 2022 Oral [video].*
- Building Robot Intelligence by Learning from Human
  *Tsinghua University, May. 2022; University of Toronto, Jan. 2022.*
- Learning by Watching: Physical Imitation of Manipulation Skills from Human Videos
  *RSS 2021 Workshop on Visual Learning and Reasoning for Robotics, Jul. 2021.* [video].

## Professional Service

- **Reviewer**: ICRA 22′, IROS 22′,23′, RA-L 22′, ICLR 24′, CVPR 24′.

## Skills

I work on full-stack robotics

- **Programming**: Python, C++
- **Physical Robots**: Hands-on experience with hardware:
  Arms (Franka, Stretch, WidowX, Xarm)
  Robot base (AgileX base, Slamtec base)
  Sensors (Realsense cameras, Slamtec LiDAR , Force torque sensors)
  ROS.
- **Techniques**: Experience with various robotic benchmarks (gym, RoboSuite, Meta-World, etc.),
  Simulation and Sim2real (Unity3D, MuJoCo, IsaacGym)
  Teleopration systems for Imitaion learning (Meta Quest 2)
- **Languages**: Fluent in Mandarin, English

## Selected Coursework

- **Undergrad**: Calculus I and II (91 & 94), Linear Algebra (96), Physics I and II (98 & 92),
- **Grad**: CS188 Introduction to A.I., CS294-158 Deep Unsupervised Learning, 16-720 Computer Vision,
  16-811 Math Foundamentals of Robotics, 16-831 Introduction to Robot Learning,
  16-711 Kinematics, Dynamics and Control
- **Others**: CS285 Deep Reinforcement Learning, CS229 Machine Learning, CS231n Computer Vision