

# Xingyu Lin

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Homepage: <https://xingyu-lin.github.io/>

## CURRENT POSITION

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**University of California, Berkeley** Aug 2022 - Aug 2024 (expected)  
*Postdoctoral Scholar* (Advisor: [Pieter Abbeel](#))

## EDUCATION

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**Carnegie Mellon University** Aug 2017 - Aug 2022  
*Ph.D.* in Robotics (Advisor: [David Held](#))  
Thesis: “*Learning Structured World Model for Deformable Object Manipulation*”

**Peking University** Sep 2013 - May 2017  
*B.S.* in Computer Science (Summa Cum Laude)

## RESEARCH INTERESTS

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My research lies in robotics, machine learning, and computer vision, with the primary goal of learning generalizable robotic manipulation skills. Specifically, I am interested in (1) learning structured world models with abstractions for planning and control; (2) pre-training visual representation and skills to enable knowledge transfer from Internet-scale vision datasets and simulators. Ultimately, my goal is to enable robots to assist humans in unstructured environments.

## PROFESSIONAL EXPERIENCE

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**University of California, Berkeley** Aug 2022 - Aug 2024 (expected)  
*Postdoctoral Scholar* with [Pieter Abbeel](#)

**MIT-IBM Research Lab** May 2021 - Aug 2021  
*Research Intern* with [Chuang Gan](#)

**NVIDIA Seattle Robotics Lab** May 2020 - Aug 2020  
*Research Intern* with [Dieter Fox](#), [Arsalan Mousavian](#), and [Clemens Eppner](#)

**Carnegie Mellon University** May 2016 - Aug 2016  
*Undergraduate Research Intern* with [Tai Sing Lee](#)

**Microsoft Research Asia (MSRA)** Feb 2016 - May 2016  
*Research Intern*

**Peking University** Apr 2015 - Feb 2016  
*Undergraduate Research Intern* with [Yizhou Wang](#)

## CONFERENCE PAPERS \* denotes equal contribution or equal advising

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- [C17] Chuan Wen\*, **Xingyu Lin\***, John So\*, Kai Chen, Qi Dou, Yang Gao, and Pieter Abbeel. Any-point Trajectory Modeling for Policy Learning, *Robotics: Science and Systems (RSS)*, 2024
- [C16] Carmelo Sferrazza, Dun-Ming Huang, **Xingyu Lin**, Youngwoon Lee, and Pieter Abbeel. HumanoidBench: Simulated Humanoid Benchmark for Whole-Body Locomotion and Manipulation, *Robotics: Science and Systems (RSS)*, 2024

- [C15] **Xingyu Lin\***, John So\*, Sashwat Mahalingam, Fangchen Liu, and Pieter Abbeel. [SpawnNet: Learning Generalizable Visuomotor Skills from Pre-trained Networks](#), *IEEE International Conference on Robotics and Automation (ICRA)*, 2024
- [C14] Zixuan Huang, **Xingyu, Lin**, and David Held. [Self-supervised Cloth Reconstruction via Action-conditioned Cloth Tracking](#), *IEEE International Conference on Robotics and Automation (ICRA)*, 2023
- [C13] Zhenjia Xu, Zhou Xian, **Xingyu, Lin**, Cheng Chi, Zhiao Huang, Chuang Gan, and Shuran Song. [RoboNinja: Learning an Adaptive Cutting Policy for Multi-Material Objects](#), *Robotics: Science and Systems (RSS)*, 2023
- [C12] **Xingyu, Lin**, Carl Qi, Yunchu Zhang, Zhiao Huang, Katerina Fragkiadaki, Yunzhu Li, Chuang Gan, and David Held. [Planning with Spatial-Temporal Abstraction from Point Clouds for Deformable Object Manipulation](#), *Conference on Robot Learning (CoRL)*, 2022
- [C11] Zixuan Huang, **Xingyu, Lin**, and David Held. [Mesh-based Dynamics Model with Occlusion Reasoning for Cloth Manipulation](#), *Robotics: Science and Systems (RSS)*, 2022
- [C10] **Xingyu Lin**, Zhiao Huang, Yunzhu Li, Joshua B. Tenenbaum, David Held, and Chuang Gan. [DiffSkill: Skill Abstraction from Differentiable Physics for Deformable Object Manipulations with Tools](#), *International Conference on Learning Representations (ICLR)*, 2022
- [C9] Narasimhan Gautham, Zhang Kai, Eisner Ben, **Xingyu, Lin**, and Held David. [Transparent Liquid Segmentation for Robotic Pouring](#), *IEEE International Conference on Robotics and Automation (ICRA)*, 2022
- [C8] **Xingyu Lin\***, Yufei Wang\*, Zixuan Hunag, and David Held. [Learning Visible Connectivity Dynamics for Cloth Smoothing](#), *Conference on Robot Learning (CoRL)*, 2021
- [C7] **Xingyu Lin**, Yufei Wang, Jake Olkin, and David Held. [SoftGym: Benchmarking Deep Reinforcement Learning for Deformable Object Manipulation](#), *Conference on Robot Learning (CoRL)*, 2020
- [C6] Yufei Wang\*, Narayan Gautham\*, **Xingyu Lin**, Brian Okorn, and David Held. [Visual Self-Supervised Reinforcement Learning with Object Reasoning](#), *Conference on Robot Learning (CoRL)*, 2020
- [C5] **Xingyu Lin\***, Harjatin Baweja\*, George Kantor, and David Held. [Adaptive Auxiliary Task Weighting for Reinforcement Learning](#), *Neural Information Processing Systems (NeurIPS)*, 2019
- [C4] **Xingyu Lin**, Pengsheng Guo, Carlos Florensa, and David Held. [Adaptive variance for changing sparse-reward environments](#), *IEEE International Conference on Robotics and Automation (ICRA)*, 2019
- [C3] **Xingyu Lin**, Hao Wang, Zhihao Li, Yimeng Zhang, Alan Yuille, and Tai Sing Lee. [Transfer of view-manifold learning to similarity perception of novel objects](#), *International Conference on Learning Representations (ICLR)*, 2017
- [C2] **Xingyu Lin**, Mingxuan Chai, Sheng Li, and Guoping Wang. [Time-varying light motion in single convergence](#), *Computer Animation and Virtual Worlds*, 2018
- [C1] Hao Wang, **Xingyu Lin**, Yimeng Zhang, and Tai Sing Lee. [Learning robust object recognition using composed scenes from generative models](#), *Conference on Computer and Robot Vision (CRV)*, 2017

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## JOURNAL PAPER

- [J1] Carl Qi, **Xingyu Lin**, and David Held. [Learning Closed-loop Dough Manipulation Using a Differentiable Reset Module](#), *Robotics and Automation Letters (RA-L)* with presentation at the *International Conference on Intelligent Robots and Systems (IROS)*, 2022

## UNDER REVIEW AND PRE-PRINTS

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- [P4] Philipp Wu, Yide Shentu, Zhongke Yi, **Xingyu, Lin**, and Pieter Abbeel. [GELLO: A General, Low-Cost, and Intuitive Teleoperation Framework for Robot Manipulators](#), *Under review; Presented at Workshop on Towards Generalist Robots (Oral)*, 2023
- [P3] Kai Chen, Yiyao Ma, **Xingyu Lin**, Stephen James, Jianshu Zhou, Yun-Hui Liu, Pieter Abbeel, and Qi Dou. Pose-Adaptor: Object Pose Estimation for Novel Object Categories by Adapting Vision Foundation Models with Synthetic Data, *Under review*, 2023
- [P2] Carl Qi, Sarthak Shetty, **Xingyu Lin\***, and David Held\*. [Learning Generalizable Tool-use Skills through Trajectory Generation](#), *arXiv preprint arXiv:2310.00156*, 2023
- [P1] **Xingyu Lin**, Harjatin Singh Baweja, and David Held. [Reinforcement learning without ground-truth state](#), *Workshop on Multi-Task and Lifelong Reinforcement Learning, ICML*, 2019

## INVITED TALKS

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### **A Bottom-up Approach Towards Generalizable Robot Learning**

- Invited talks at Google DeepMind, Apple, Toyota Research Institute 2024
- Invited talks at UCSB, Purdue, Georgia Institute of Technology, NUS, HKU 2024
- Invited talk at Berkeley AI Seminar 2024

### **Generalizable Robot Learning beyond the Training Data**

- Invited talk at UCSD 2023
- Invited talk at Princeton 2023
- Invited talk at NYU, Computational Intelligence, Learning, Vision and Robotics group 2023
- Invited talk at Columbia 2023
- Invited talk at UCLA, Machine Intelligence (MINT) group 2023
- Invited talk at UT Austin, Robot Perception and Learning (RPL) Lab 2023

### **Generalizable Manipulation with Large Internet Data and Small Robot Data**

- Invited talk and panelist at RSS Workshop on Interdisciplinary Exploration of Generalizable Manipulation Policy Learning 2023

### **Learning Structured World Model for Deformable Object Manipulation**

- Invited talk at Stanford Vision and Learning Lab 2022
- Invited talk at UC Berkeley Robot Learning Lab 2022
- Invited talk at MIT Computational Design and Fabrication Group 2022
- RSS Workshop on Deformable Object Simulation in Robotics 2021

## SELECTED PRESS COVERAGE

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- [P1] [Can robots make pizza? Scientists are working on it](#), by Galadriel Watson, *Washington Post*, Sep 6, 2022.
- [P2] [Solving the challenges of robotic pizza-making](#), by Adam Zewe, *MIT News*, March 31, 2022.
- [P3] [This deep learning technique solves one of the tough challenges of robotics](#), by Ben Dickson, *Tech Talks*, May 9, 2022.
- [P4] [Better learning through ‘complex dough-manipulation’](#), by Brian Heater, *Tech Crunch*, Mar 31, 2022.

[P5] [Robotic Manipulation of Deformable Objects](#), by Katyanna Quach, *AZO Robotics*, Apr 4, 2022.

[P6] [Here's to the rise of the robot bartender](#), by *Institution of Mechanical Engineers*, Jun 9, 2022.

## SELECTED HONORS AND AWARDS

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| <b>RSS Pioneer</b>   | 2022      |
| Awarded to 30 early-career researchers in robotics worldwide                           |           |
| <b>DAAD AInet Fellowship in AI and Robotics</b>  | 2022      |
| <b>Founder Scholarship</b> , Peking University   | 2016      |
| <b>Guanghua Scholarship</b> , Peking University  | 2015      |
| <b>1<sup>st</sup> Place Award, Mathematical Modelling Contest of Peking University</b> | 2014-2015 |
| Back-to-back winners for two years among 60 teams.                                     |           |
| <b>Scholarship of Yitianmingsheng</b> , Peking University                              | 2014      |
| <b>Silver Medal in China National Olympiad in Informatics</b>                          | 2014      |

## STUDENT MENTORING

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### Ph.D. Students

- Phillip Wu (UC Berkeley) GELLO [P4]
- Chuan Wen (Tsinghua, visiting)

### Master's Students

- Yufei Wang (CMU MSCS → Ph.D. student at CMU) CoRL 2020 [C6, C7], CoRL 2021 [C8]
- Carl Qi (CMU MSML → Ph.D. student at UT Austin) RA-L 2022 [J1], CoRL 2022 [C12]
- Zixuan Huang (CMU MSR → Ph.D. student at Umich) CoRL 2021 [C8], RSS 2022 [C11], ICRA 2023 [C14]
- Gautham Narasimhan (CMU MSME → Path Robotics) CoRL 2020 [C6]
- Pengsheng Guo (CMU MRSD → Apple) ICRA 2019 [C4]

### Undergraduate Students

- John So (UC Berkeley → MSCS at Stanford ) SpawnNet [C15]
- Sashwat Mahalingam (UC Berkeley) High-dimension Control with RL
- Aryan Jain (UC Berkeley) Trajectory Pre-training from Videos with Diffusion Models

## TEACHING

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### Teaching Assistant

- CMU 16831: Statistical Techniques in Robotics (Instructor: Kris Kitani) Spring 2021
- CMU 10703: Deep Reinforcement Learning and Control (Instructor: Katerina Fragkiadaki) Fall 2019
- Peking University: Algorithm Analysis and Design (Instructor: Yizhou Wang) Fall 2016
- Peking University: Introduction to Computer System (Instructor: Yingfei Xiong) Fall 2015

## DIVERSITY, EQUITY, AND INCLUSION

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- Mentor for undergraduate AI mentoring program, CMU 2018-2019
- Mentor for undergraduate AI mentoring program, UC Berkeley 2022-present
  - Mentor undergrads from underrepresented groups to help them get started in AI.
- Podcast speaker for high-school students about AI and robotics 2023

## SERVICES

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### Workshop Organizer

- *Co-Organizer*, 3D Visual Representations for Manipulation Workshop, ICRA 2024
- *Co-Organizer*, RSS Pioneers Workshop, RSS 2023

### Reviewer

- Journal: IEEE Transactions on Robotics (T-RO), IEEE Robotics and Automation Letters (RA-L), Autonomous Robots
- Conferences: NeurIPS, ICML, ICLR, RSS, CoRL, ICRA, IROS

### Department Service

- UC Berkeley EECS PhD Admissions Committee, 2022 - 2023
- CMU Master in Computer Vision (MSCV) Admissions Committee, 2019 - 2020