

XIANYI CHENG

Email: xianyic@andrew.cmu.edu
Website: <https://xianyicheng.github.io>

Carnegie Mellon University
Pittsburgh, PA 15213, USA

EDUCATION

Carnegie Mellon University

Ph.D. in Mechanical Engineering 2019 - 2024 (expected)
Advisor: Matthew T. Mason

Carnegie Mellon University

M.S. in Robotics, School of Computer Science 2017 - 2019
Advisor: Matthew T. Mason

RESEARCH INTERESTS

Robotic Manipulation; Robot Dexterity; Dexterous and In-hand Manipulation; Planning, Control, Learning, and State Estimation with Contacts; Contact Mechanics; Force and Compliance Control

PUBLICATIONS

- [1] **Enhancing Dexterity in Robotic Manipulation via Hierarchical Contact Exploration**
Xianyicheng, Sarvesh Patil, Zeynep Temel, Oliver Kroemer, Matthew T. Mason
Robotics and Automation Letters (RAL), 2023
- [2] **Autogenerated Manipulation Primitives**
Eric Huang, Xianyicheng, Yuemin Mao, Arnav Gupta, Matthew T Mason
The International Journal of Robotics Research (IJRR), 2023
- [3] **Learning Preconditions of Hybrid Force-Velocity Controllers for Contact-Rich Manipulation**
Jacky Liang, Xianyicheng, Oliver Kroemer
The Conference on Robot Learning (CoRL), 2022
- [4] **Extrinsic Dexterous Manipulation with a Direct-Drive Hand: A Case Study**
Arnav Gupta, Yuemin Mao, Ankit Bhatia, Xianyicheng, Jonathan King, Yifan Hou, Matthew T Mason
International Conference on Intelligent Robots and Systems (IROS), 2022
- [5] **Contact Mode Guided Motion Planning for Quasidynamic Dexterous Manip-**

ulation in 3D

Xianyi Cheng, Eric Huang, Yifan Hou, Matthew T. Mason

IEEE International Conference on Robotics and Automation (ICRA), 2022

- [6] **Contact Mode Guided Sampling-Based Planning for Quasistatic Dexterous Manipulation in 2D**

Xianyi Cheng, Eric Huang, Yifan Hou, Matthew T. Mason

IEEE International Conference on Robotics and Automation (ICRA), 2021

- [7] **Efficient Contact Mode Enumeration in 3D**

Eric Huang, Xianyi Cheng, Matthew T. Mason

International Workshop on the Algorithmic Foundations of Robotics (WAFR), 2020

- [8] **Manipulation with Suction Cups Using External Contacts**

Xianyi Cheng, Yifan Hou, Matthew T. Mason

International Symposium on Robotics Research (ISRR), 2019

- [9] **Data-Efficient Process Monitoring and Failure Detection for Robust Robotic Screwdriving**

Xianyi Cheng, Zhengzhong Jia, Matthew T. Mason

IEEE International Conference on Automation Science and Engineering (CASE), 2019

- [10] **Sensor Selection and Stage & Result Classifications for Automated Miniature Screwdriving**

Xianyi Cheng, Zhengzhong Jia, Ankit Bhatia, Reuben M Aronson, Matthew T. Mason

IEEE/RSJ International Conference on Intelligent Robots (IROS), 2018

- [11] **WebArena: A Realistic Web Environment for Building Autonomous Agents**

Shuyan Zhou, Frank F. Xu, Hao Zhu, Xuhui Zhou, Robert Lo, Abishek Sridhar,

Xianyi Cheng, Tianyue Ou, Yonatan Bisk, Daniel Fried, Uri Alon, Graham Neubig.

Agent Learning in Open-Endedness Workshop (ALOE), 2023

SELECTED HONORS & AWARDS

MIT EECS Rising Stars

2021

Foxconn Fellowship

2018

TEACHING

Dynamics, CMU 24-351, Undergraduate-level

Fall 2022

Teaching Assistant and Instructor for Weekly Recitations

Robot Dynamics and Analysis, CMU 24-760, Graduate-level

Fall 2021

Teaching Assistant and Instructor for Weekly Recitations

INVITED TALKS

Broadening Robot Dexterity: Leveraging Various Elements in Manipulation Task Environments

RoboGrads Seminar, Georgia Tech, *Hosted by Sonia Chernova* 2023

Intelligent Robot Lab, Brown University, *Hosted by George Konidakis* 2023

DAIR Lab, University of Pennsylvania, *Hosted by Michael Posa* 2023

Contact Mode Guided Motion Planning for Nonprehensile Dexterous Manipulation

The Machines in Motion Lab, New York University, *Hosted by Ludovic Righetti* 2022

R-PAD Lab, Carnegie Mellon University, *Hosted by David Held* 2022

AIRLab, Lehigh University, *Hosted by Jeff Trinkle* 2021

SERVICE

Reviewer at RAL, IROS, ICRA, MRS

Co-organizer of IROS Workshop on Leveraging Models for Contact-rich Manipulation 2023

Panelist of Women in MechE, Graduate School Application 2021

MENTORSHIP

Undergraduate Students: Yuemin Mao (CMU ME, now PhD Student at CMU Robotics), Karen Li (CMU CS), Leo Nicolussi (CMU ME)

Master Students: Tianxin Li (CMU ECE), Divya Aggarwal (CMU ECE), Elizabeth Amy Santoso (CMU ME), Yifu Jin (CMU ECE)

WORK EXPERIENCE

Applied Scientist Intern, **Amazon Robotics AI**, *Stow Team* 2022

- Developed manipulation motion strategies for stowing processes in warehouse automation

Research Intern, **ABB Robotics Research** 2020

- Developed deep learning vision algorithms for grasp planning