

MINGXIN YU

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MIT Building 31, 70 Vassar St, Cambridge, MA 02139, USA

RESEARCH INTEREST

Planning and safe control for robotic manipulation, especially combined with machine learning.

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA, USA Sept. 2022 - Current
Ph.D. student at Department of Aeronautics and Astronautics. *Advisor: Prof. Chuchu Fan*

Peking University, Beijing, China Sept. 2017 - July 2022
B.S. in School of Physics.

PUBLICATIONS & MANUSCRIPTS

Mingxin Yu, Chuchu Fan. Rigid Body Path Planning Using Mixed-Integer Linear Programming. *IEEE Robotics and Automation Letters (RA-L)*, 2024.

Mingxin Yu, Chenning Yu, Mahdi Naddaf, Devesh Upadhyay, Sicun Gao, Chuchu Fan. Efficient Motion Planning for Manipulators with Control Barrier Function-Induced Neural Controller. *IEEE International Conference on Robotics and Automation (ICRA)*, 2024.

Bingchen Zhao, Shaozuo Yu, Wufei Ma, **Mingxin Yu**, Shenzhao Mei, Angtian Wang, Ju He, Alan Yuille, Adam Kortylewski. ROBIN: A Benchmark for Robustness to Individual Nuisances in Real-World Out-of-Distribution Shifts. *17th European Conf. on Computer Vision (ECCV)*, 2022. **(Oral)**

Mingxin Yu*, Lin Shao*, Zhehuan Chen, Tianhao Wu, Qingnan Fan, Kaichun Mo, Hao Dong. RoboAssembly: Learning Generalizable Furniture Assembly Policy in a Novel Multi-robot Contact-rich Simulation Environment. *arXiv preprint arXiv: 2112.10143*, 2021.

RESEARCH EXPERIENCE

Research Assistant, Massachusetts Institute of Technology, Cambridge, MA, USA *Sep. 2022 - Now*
Advisor: Prof. Chuchu Fan

- Safe learning-based planning algorithms for multi-DoF manipulators.
- Optimization-based geometric motion planning.
- Compositional diffusion policy for manipulation.

Research Intern (remote), Johns Hopkins University, Baltimore, MD, USA *July. 2021 - Dec. 2021*
Mentor: Prof. Alan L. Yuille and Dr. Adam Kortylewski

- Proposed an adaptive generative 3D model of neural feature activations which can combine classification with 3D pose estimation via differentiable rendering and minimizing reconstruction error.

Research Intern, Peking University, China *Apr. 2020 - Sep. 2021*
Mentor: Dr. Lin Shao (Stanford) and Prof. Hao Dong

- Adjusted and annotated a set of furniture in PartNet dataset to meet physical constraints.
- Proposed an algorithm to assemble a diverse set of chairs under physical constraints

Research Intern, Peking University, China *Sept. 2019 - Nov. 2019*
Mentor: Prof. Zhi Qi, Center for Quantitative Biology

- Verified traditional mechanisms insufficient to explain the low time consumption for P53 to find target gene through theoretical computation and simulation.

Research Intern, Peking University, China

Jul. 2018 - Aug. 2019

Mentor: Prof. Chao Tang, Dr. Shanshan Qin, Center for Quantitative Biology

- Designed 3D model of experimental setup with SolidWorks to apply monochromatic stimulus and restrict drosophila movement to 1-dimension.
- Implemented automatic video analysis program with Matlab.

Contest Participant,

Jan. 2018 - Aug. 2018

China Undergraduate Physics Tournament (CUPT)

- Using Plateau-Rayleigh instability theoretically predicted and experimentally tested the existence of a universal constant in bubble formation.

PRIZES & AWARDS

Mathworks Fellowship

June 2023

Peking University Scholarship, *Peking University*

Sept. 2019

Outstanding Scientific Research Award, *Peking University*

Sept. 2019

Outstanding Physics Student Scholarship, *School of Physics, Peking University*

Sept. 2019

Jinhui Scholarship, *School of Physics, Peking University*

Sept. 2018

National First Prize, *China Undergraduate Physics Tournament (CUPT)*

Aug. 2018

Gold Medal, *Chinese Physics Olympiad (CPhO)*

Nov. 2016

SERVICE

Reviewer for: IROS 2024, ICRA 2024, RA-L, NFM 2023, TACAS 2023.

TECHNICAL SKILLS

- **Programming Languages:** Python (proficient) , C++, Matlab
- **Platform:** PyTorch (proficient)
- **Language:** Chinese (native), English (Proficient)