

# Fan Yang

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## Education

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<b>University of Michigan</b>	Aug 2023 – Jun 2027(expected)
<i>PhD in Robotics</i>	<i>Ann Arbor, MI, US</i>
<b>Carnegie Mellon University</b>	Aug 2021 – Jun 2023
<i>Master of Science in Robotics</i>	<i>Pittsburgh, PA, US</i>
<b>Tsinghua University</b>	Aug 2016 – Jun 2020
<i>Bachelor of Engineering in Engineering Mechanics (Honor program, Qian Class)</i>	<i>Beijing, China</i>

## Publications

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**Yang, Fan**, Wenxuan Zhou, Zuxin Liu, Ding Zhao, and David Held. "Reinforcement Learning in a Safety-Embedded MDP with Trajectory Optimization." In 2024 IEEE International Conference on Robotics and Automation (ICRA).

Huang, Zixuan, Yating Lin, **Fan Yang**, and Dmitry Berenson. "Subgoal Diffuser: Coarse-to-fine Subgoal Generation to Guide Model Predictive Control for Robot Manipulation." In 2024 IEEE International Conference on Robotics and Automation (ICRA).

Zhou, Wenxuan, Bowen Jiang, **Fan Yang**, Chris Paxton, and David Held. "HACMan: Learning Hybrid Actor-Critic Maps for 6D Non-Prehensile Manipulation." In 7th Annual Conference on Robot Learning. 2023.

**Yang, Fan**, Wenxuan Zhou, Harshit Sikchi, and David Held. "Self-Paced Policy Optimization with Safety Constraints." ICML Safe Learning for Autonomous Driving Workshop, 2022

**Yang, Fan**, Chao Yang, Huaping Liu, and Fuchun Sun. "Evaluations of the Gap between Supervised and Reinforcement Lifelong Learning on Robotic Manipulation Tasks." In Conference on Robot Learning, pp. 547-556. PMLR, 2022.

**Yang, Fan**, Chao Yang, Di Guo, Huaping Liu, and Fuchun Sun. "Fault-aware robust control via adversarial reinforcement learning." In 2021 IEEE 11th Annual International Conference on CYBER Technology in Automation, Control, and Intelligent Systems (CYBER), pp. 109-115. IEEE, 2021.

Li, Jiachen, **Fan Yang**, Hengbo Ma, Srikanth Malla, Masayoshi Tomizuka, and Chiho Choi. "Rain: Reinforced hybrid attention inference network for motion forecasting." In Proceedings of the IEEE/CVF International Conference on Computer Vision, pp. 16096-16106. 2021.

Li, Jiachen\*, **Fan Yang\***, Masayoshi Tomizuka, and Chiho Choi. "Evolvegraph: Multi-agent trajectory prediction with dynamic relational reasoning." Advances in neural information processing systems 33 (2020): 19783-19794.

## Research Experience

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### Graduate Research Assistant at *University of Michigan*

Aug. 2023 – Present

Advisor: Dmitry Berenson

Ann Arbor, MI, US

- Working on multi finger dexterous manipulation with trajectory optimization for tool use.

### Graduate Research Assistant at *Carnegie Mellon University*

Aug. 2021 – Jun. 2023

Advisor: David Held

Pittsburgh, PA, US

- Designed a hierarchical framework for safe reinforcement learning that uses trajectory optimization as a low-level policy to ensure safety constraints. It achieves state-of-the-art performance for the Safety Gym benchmark tasks.
- Combined high-level motion planning with low-level policy in long-horizon manipulation tasks.
- Investigated extracting better representations of point cloud for manipulation tasks inspired by contact points and using it for RL.

### Research Assistant at *Tsinghua University*

Aug. 2020 – Jun. 2021

Advisor: Huaping Liu

Beijing, China

- Developed an adversarial training method to make robots robust to joint damage.
- Developed a set of continual learning tasks and evaluated SOTA continual learning algorithm in RL domain. Demonstrated the gap of continual learning algorithm on RL tasks.

### Research Assistant at *University of California, Berkeley*

Sep. 2019 – Mar. 2020

Advisor: Masayoshi Tomizuka

Berkeley, CA, US

- Developed an algorithm that extracts the relation between multiple agents and predict their trajectories with multi-modalities in a highly interactive and dynamical system, e.g. traffic, and physical particles.
- Designed a hybrid attention mechanism by using RL to prune unimportant edges in a graph and applying soft attention on the remaining graph in trajectory predictions.

### Research Assistant at *Stanford University*

Jun. 2019 – Aug. 2020

Advisor: Oussama Khatib

Stanford, CA, US

- Developed an operational-space compliant control method with an optimization algorithm to select grasping points. The method was tested on an Allegro hand.

## Awards & Honors

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### “Spark” Undergraduate Research Fellowship (Awarded to 50 out of 3000 students)

Tsinghua University

2019

## Specialized Skills

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**Technical Skills:** Machine learning, trajectory optimization, RL, computer vision.

**Programming Languages:** Python, C, C++, MATLAB, Julia

**Libraries:** PyTorch, ROS, TensorFlow

**Software:** SolidWorks, Abaqus

## Academic Services

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- Reviewer of International Conference on Robotics and Automation (ICRA), Conference on Robotic Learning (CoRL), Intelligent Vehicles Symposium (IV).

## Competition

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- Fourth in MineRL Competition of NeurIPS 2020, advised by Prof. Lin Shao and Prof. Jiankun Wang