

Fan Yang

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Education

University of Michigan <i>PhD in Robotics</i>	Aug 2023 – Jun 2027 <i>Ann Arbor, MI, US</i>
Carnegie Mellon University <i>Master of Science in Robotics</i>	Aug 2021 – Present <i>Pittsburgh, PA, US</i>
Stanford University <i>Summer Session</i>	Jun 2018 – Aug 2018 <i>Stanford, CA, US</i>
Tsinghua University <i>Bachelor of Engineering in Engineering Mechanics (Honor program, Qian Class)</i>	Aug 2016 – Jun 2020 <i>Beijing, China</i>

Research Experience

Graduate Research Assistant at Carnegie Mellon University <i>Advisor: David Held</i> <ul style="list-style-type: none">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.	Aug. 2021 – Present <i>Pittsburgh, PA, US</i>
Research Assistant at Tsinghua University <i>Advisor: Huaping Liu</i> <ul style="list-style-type: none">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.	Aug. 2020 – Jun. 2021 <i>Beijing, China</i>
Research Assistant at University of California, Berkeley <i>Advisor: Masayoshi Tomizuka</i> <ul style="list-style-type: none">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.	Sep. 2019 – Mar. 2020 <i>Berkeley, CA, US</i>
Research Assistant at Stanford University <i>Advisor: Oussama Khatib</i> <ul style="list-style-type: none">Developed an operational-space compliant control method with an optimization algorithm to select grasping points. Given only rough geometry and location of the objects, our method can grasp objects precisely without any force, tactile or vision sensing.	Jun. 2019 – Aug. 2020 <i>Stanford, CA, US</i>
Research Assistant at Purdue University <i>Advisor: Richard Voyles</i> <ul style="list-style-type: none">Developed mathematical formulations for an operational space hierarchical controller for Unmanned Aerial Vehicles with a parallel manipulator, including Jacobian matrix, mass matrix, and null space control.	Aug. 2018 – Jan. 2020 <i>West Lafayette, IN, US</i>

Publications

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.

Yang, Fan, Wenxuan Zhou, David Held. "Reinforcement Learning in a Safety-Embedded MDP with Trajectory Optimization". To be submitted to Robotics: Science and Systems 2023.

Awards & Honors

"Spark" Undergraduate Research Fellowship (Awarded to 50 out of 3000 students)	
<i>Tsinghua University</i>	2019
Academic Excellence Scholarship (Awarded to 30% of students)	
<i>Tsinghua University</i>	2018 & 2017
"Xuetang" Scholarship (Awarded to 200 out of 3000 students)	
<i>Tsinghua University</i>	2019 & 2018 & 2017
Overall Excellence Scholarship (awarded to 10% of the students)	
<i>Tsinghua University</i>	2018

Specialized Skills

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

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

Competition

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