

Peihong Yu

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in [peihong-yu](#)

Research Interests

I currently work in the field of **Reinforcement Learning**, mostly **Multi-Agent RL**. The core of my work is to address the challenges of **training efficiency** and **generalizability**, allowing autonomous agents to learn effectively and perform robustly across diverse scenarios. I also have background in **3D Reconstruction** and Simultaneous Localization and Mapping (**SLAM**).

Education

- 2019–Present **University of Maryland, College Park, Maryland, United States**
PhD Student in Computer Science.
Advisor: [Pratap Tokekar](#)
- 2016–2020 **University of Chinese Academy of Sciences, Shanghai, China**
(Associated program with **ShanghaiTech University**)
Master of Science in Engineering, Communication and Information Systems.
Advisors: [Jingyi Yu](#), [Laurent Kneip](#)
- 2012–2016 **Shanghai University, Shanghai, China**
Bachelor of Engineering, Computer Science and Technology
Ranking: 10/285

Employments

- Summer 2023 **Research Intern, Multi-Agent Reinforcement Learning** at *SRI International, CVT*.
Advised by [Aswin Raghavan](#).
- Developed a robust multi-agent coordination framework by integrating historical observations and communications into a unified Common Operating Picture (COP), demonstrating significant improvements in policy robustness to out-of-distribution scenarios ([Published](#) in CoRL OOD Workshop 2023)
- Summer 2022 **Research Intern, 3D Computer Vision/Machine Learning (PhD)** at *Meta Reality Lab*.
Advised by [True Price](#).
- Developed a novel permutation-equivariant network architecture for robust pose graph optimization and achieved reliable convergence with poor initializations, addressing critical challenges in large-scale 3D reconstruction and mapping).

Publications & Preprints

* denotes equal contribution.

- In Submission **Sketch-to-Skill: Bootstrapping Robot Learning with Human Drawn Trajectory Sketches**.
[Peihong Yu*](#), [Amisha Bhaskar*](#), [Anukriti Singh](#), [Zahiruddin Mahammad](#), and [Pratap Tokekar](#).
[\[Paper Link\]](#)

- In Submission **Equitable Optimization Across Preferences: A Maximinimalist Approach to Persistent Monitoring with Preference-based Reinforcement Learning.**
Manav Mishra, [Peihong Yu](#), Sujit PB, Pratap Tokekar.
- Preprint **On the Sample Complexity of a Policy Gradient Algorithm with Occupancy Approximation for General Utility Reinforcement Learning.**
Anas Barakat, Souradip Chakraborty, [Peihong Yu](#), Pratap Tokekar, Amrit Singh Bedi.
Arxiv, 2024. [\[Paper Link\]](#)
- AAMAS'25 **TACTIC: Task-Agnostic Contrastive pre-Training for Inter-Agent Communication.**
[Peihong Yu](#), Manav Mishra, Syed Zaidi, and Pratap Tokekar.
The 24th International Conference on Autonomous Agents and Multi-Agent Systems, 2025 [\[Paper Link\]](#)
- TMLR'25 **Beyond Joint Demonstrations: Personalized Expert Guidance for Efficient Multi-Agent Reinforcement Learning.**
[Peihong Yu](#), Manav Mishra, Alec Koppel, Carl Busart, Priya Narayan, Dinesh Manocha, Amrit Singh Bedi, and Pratap Tokekar.
Transactions on Machine Learning Research, 2025. [\[Paper Link\]](#)
- OOD @CoRL'23 **Enhancing Multi-Agent Coordination through Common Operating Picture Integration.**
[Peihong Yu](#), Bhoram Lee, Aswin Raghavan, Supun Samarasekara, Pratap Tokekar, James Zachary Hare.
First Workshop on Out-of-Distribution Generalization in Robotics at CoRL 2023. [\[Paper Link\]](#)
- Preprint **Insta-RS: Instance-wise Randomized Smoothing for Improved Robustness and Accuracy.**
Chen Chen, Kezhi Kong, [Peihong Yu](#), Juan Luque, Tom Goldstein, Furong Huang.
Arxiv, 2021. [\[Paper Link\]](#)
- IEEE Access'20 **Accurate Line-Based Relative Pose Estimation with Camera Matrices.**
[Peihong Yu](#), Cen Wang, Zhirui Wang, Jingyi Yu, and Laurent Kneip.
IEEE Access, 2020. [\[Paper Link\]](#)
- ICCV'17 **Ray Space Features for Plenoptic Structure-from-Motion.**
Yingliang Zhang, [Peihong Yu](#), Wei Yang, Yuanxi Ma, and Jingyi Yu.
IEEE International Conference on Computer Vision, 2017. [\[Paper Link\]](#)
- ICCP'17 **The Light Field 3d Scanner.**
Yingliang Zhang, Zhong Li, Wei Yang, [Peihong Yu](#), Haiting Lin, and Jingyi Yu.
IEEE International Conference on Computational Photography, 2017. [\[Paper Link\]](#)

Professional Services

- Reviewer ICRA 2023, ICLR 2025, RA-L 2025.
- Mentoring [AI4ALL Summer Program](#) at UMD.

Technical Skills

- Languages Python, C++, Matlab
- Librarys PyTorch, Tensorflow, PyMARL, RLlib, Stable Baseline 3, OpenAI Gym
- Other Tools ROS, Gazebo, Unreal Engine