TIANYANG PAN

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EDUCATION

Rice University Aug. 2019 – May 2024 *(expected)*
Ph.D. in Computer Science GPA: 3.94/4.0
Dissertation: *Towards Robust and Scalable Task and Motion Planning in the Real World*
Advisor: Dr. Lydia E. Kavraki

University of Michigan, Ann Arbor Aug. 2017 – Apr. 2019
M.S. in Electrical and Computer Engineering GPA: 4.0/4.0

University of California, Berkeley Aug. 2016 – Dec. 2016
Visiting Student, Department of Electrical Engineering and Computer Science GPA: 4.0/4.0

Southeast University, Nanjing, China Sept. 2013 – Jun 2017
B.E. in Information Engineering GPA: 3.73/4.0

RESEARCH EXPERIENCE

Kavraki Lab, Rice University Aug. 2019 – Present
Advisor: Dr. Lydia E. Kavraki

· Led several research projects and authored papers in the field of robotic task and motion planning.
  1. Extended task and motion planning to break the standard assumptions prevalent in the field. Developed methods that enable robots to robustly and efficiently accomplish long-horizon real-world manipulation tasks, even with limited domain knowledge of the world.
  2. Developed task and motion planning methods that focus on scaling multi-robot collaborative manipulation and coordinated navigation, collaborating with control systems specialists.
  3. Combined traditional task and motion planning solvers with cutting-edge developments in AI such as large-language models (LLM) for powerful, robust, and flexible robotic frameworks.
· Integrated large-scale software projects on real-robot systems contributing to research in the lab.
  1. Performed extensive real-robot experiments and shared collected data as open-source dataset.
  2. Developed software that enhanced lab infrastructure, led to lab demos and shared for research.

Lab for Progress, University of Michigan, Ann Arbor Mar. 2018 – May. 2019
Advisor: Dr. Odest Chadwicke Jenkins

· Collaborated in several research projects and co-author papers on (1) robot learning from human demonstrations, (2) grasp pose detection algorithms for transparent objects.
· Responsible for the construction and maintenance of the manipulation pipeline on the Fetch robot.
· Performed an on-site demonstration of mobile manipulation at Magna International, Troy.

Information Security Lab, Southeast University July. 2015 – Jun. 2017
Advisor: Dr. Liquan Chen

· Collaborated as undergraduate researcher on wireless sensor network.
· Authored undergraduate thesis on encryption algorithm.

Undergraduate Research Project at Southeast University Dec. 2014 – Dec. 2015
Position: Research Team Leader

· Architected the scripts that integrate ultrasonic module, steering engine, and control logic.
· Led the team to design and assembled the mechanical and electrical elements.

PUBLICATIONS

Journal Papers

1. **Tianyang Pan**, Rahul Shome, Lydia E. Kavraki, "Task and Motion Planning for Execution in the Real," IEEE Transactions on Robotics. *In Revision*

Conference Papers

1. **Tianyang Pan**, Christos K. Verginis and Lydia E. Kavraki, "Safe and Robust Task-driven Navigation for Heterogeneous Multi-Robot Teams," *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2024, *Submitted*
2. Carlos Quintero-Peña, Zachary Kingston, **Tianyang Pan**, Rahul Shome, Anastasios Kyrillidis and Lydia E. Kavraki, "Optimal Grasps and Placements for Task and Motion Planning in Clutter," *2023 IEEE International Conference on Robotics and Automation (ICRA)*, 2023, pp. 3707-3713, doi:10.1109/ICRA48891.2023.10161455
3. **Tianyang Pan**, Andrew M. Wells, Rahul Shome and Lydia E. Kavraki, "Failure is an option: Task and Motion Planning with Failing Executions," *2022 International Conference on Robotics and Automation (ICRA)*, 2022, pp. 1947-1953, doi:10.1109/ICRA46639.2022.9812273
4. **Tianyang Pan**, Andrew M. Wells, Rahul Shome, Lydia E. Kavraki, "A General Task and Motion Planning Framework For Multiple Manipulators," *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021, pp. 3168-3174, doi:10.1109/IROS51168.2021.9636119
5. **Tianyang Pan**, Christos. K. Verginis, Andrew M. Wells, Lydia E. Kavraki, and Dimos. V. Dimarogonas, "Augmenting Control Policies with Motion Planning for Robust and Safe Multi-robot Navigation," *2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2020, pp. 6975-6981, doi:10.1109/IROS45743.2020.9341153
6. Zheming Zhou, **Tianyang Pan**, Shiyu Wu, Haonan Chang and Odest Chadwicke Jenkins, "GlassLoc: Plenoptic Grasp Pose Detection in Transparent Clutter," *2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019, pp. 4776-4783, doi:10.1109/IROS40897.2019.8967685
7. Kevin French, Shiyu Wu, **Tianyang Pan**, Zheming Zhou and Odest Chadwicke Jenkins, "Learning Behavior Trees From Demonstration," *2019 IEEE International Conference on Robotics and Automation (ICRA)*, 2019, pp. 7791-7797, doi:10.1109/ICRA.2019.8794104

AWARDS

Andrew Ladd Memorial Excellence in Computer Science Graduate Fellowship	2023
Outstanding Graduate of Southeast University (top 2%)	2017
Best Undergraduate Thesis Paper (Southeast University)	2016 – 2017
University Award for Outstanding Student Abroad (Southeast University to UC-Berkeley)	2016
The Second Prize in University Mathematical Modeling Contest	2014 – 2015
Mitsubishi EE Scholarship	2013 – 2014
The Third Prize in University Robotics and CV Contest	2013 – 2014

TECHNICAL SKILLS

Robotics Specialties	Task and motion planning, AI planning, sampling-based motion planning, multi-robot systems, model checking, Markov Decision Processes, LLMs, behavior trees, reinforcement learning, deep learning, full-stack robotics, SLAM, computer vision, Linear Systems Theory, SMT planning

Robotics Hardware	Fetch, UR5, Baxter, Depth Camera (Primesense Carmine, Realsense) Vicon System, Light field Camera (Lytro), Robotiq gripper
Programming	C/C++, Python, JAVA, MATLAB
Software & Tools	ROS, OMPL, Robowflex, MoveIt, DART, Gazebo, PyTorch, Tensorflow OpenAI Gym, FPGA, Linux, Git, Docker, Anaconda, Latex, Markdown

TEACHING EXPERIENCE

Algorithmic Robotics (COMP 450/550) Rice University

· Teaching Assistant *Fall 2021*

· Teaching Assistant *Fall 2020*

SERVICE

Organizer	Texas Regional Robotics Symposium 2023 (around 190 attendants from 6 universities)
Reviewer	ICRA, RA-L, T-RO, T-MECH