YIXUAN WANG

+1(217) 898-8544 ◇ yixuan22@illinois.edu ◇ wangyixuan12.github.io ◇ Urbana, IL

EDUCATION

University of Illinois, Urbana-Champaign 09/2021 - 05/2026 (expected)
Ph.D. in Electrical and Computer Engineering GPA: 3.91/4.00

University of Michigan, Ann Arbor 09/2019 - 05/2021
B.S. in Computer Science GPA: 3.94/4.00

Shanghai Jiao Tong University 09/2017 - 08/2021
B.S.E. in Mechanical Engineering GPA: 3.81/4.00
Honor: Shanghai Excellent Gradudate (Top 5%), Jackson and Muriel Lum Scholarship, Undergraduate Merit Scholarship (Top 10%), John Wu & Jane Sun Sunshine Scholarship, SJTU Outstanding Student, Yu Liming Scholarship

PUBLICATION

Wang. Y., McConachie, D., Berenson, D., "Tracking Partially-Occluded Deformable Objects while Enforcing Geometric Constraints", *The 2021 International Conference on Robotics and Automation (ICRA 2021).*
Wang. Y., Li, Y., Driggs-Campbell, K., Li, F., Wu, J., "Dynamic-Resolution Model Learning for Object Pile Manipulation", *Under Review*

WORK EXPERIENCE

X, the moonshot factory (formerly Google X) 05/2022 - 08/2022
Residents (Software Engineering Intern) *Mountain View, CA*
- Planned 3D human pose tracking algorithm by reviewing the literature in Everyday Robots team.
- Developed 3D human pose tracking using optimization method in C++ on a large robotic system.
- Improved robustness of existing 3D human pose tracking algorithm on evaluation dataset.
- Reached out to a Google Research team to establish cooperation across two teams.

ACADEMIC EXPERIENCE

Stanford Vision and Learning Lab & UIUC Human-Centered Autonomy Lab 08/2022 - current
Project: Object Pile Manipulation *Supervisor: Dr. Yunzhu Li & Prof. Katie Driggs-Campbell*
- Introduce a framework that can dynamically determine the scene representation at different abstraction levels.
- Evaluate that our dynamic scene representation selection performs much better than the fixed-resolution baselines.
- Develop a unified robotic manipulation system capable of various object pile manipulation tasks.

UMich Autonomous Robotic Manipulation Lab 05/2020 - 08/2021
Project: Learning-based Probabilistic Motion Planning *Supervisor: Prof. Dmitry Berenson*
- Identified the problem that RRT is probabilistically complete but not fast, while RL policy is fast but unreliable.
- Introduced a novel method to speed up RRT algorithm by using a RL policy as the tree extension strategy.
- Reduced RRT iteration numbers by 80% while improved success rate from 87.1% to 98.4% in randomly generated environments with box obstacles compared with RRT algorithm.
- Analyzed reason for bad performance of our method in corner cases like narrow passages.

Project: Robust Deformable Object Tracking *Supervisor: Dr. Dale McConachie*
- Identified problems of existing deformable object tracking algorithms based on the GMM-EM non-rigid registration process, including geometric incorrectness during physical interaction and bad robustness during occlusion.
- Introduced novel posterior constraints after GMM-EM process and adapted prediction model into GMM-EM's objective function to preserve tracking results' geometric correctness during physical interaction and improve robustness.
- Improved tracking accuracy and robustness compared with baseline methods in the simulation environment and real experiments qualitatively and published our work on ICRA 2021.

UMich Compliant Systems Design Laboratory 09/2019 - 04/2020
Project: Model-free Control over Soft Robots' Shape based on Visual Information *Supervisor: Dr. Audrey Sedal*
- Identified the problem that existing soft robot control algorithms have no state estimation module as the feedback signal.
- Implemented feature extraction using Gabor filters and k-means clustering in feature space to segment soft robots.
- Utilized Bezier curve to represent soft robot state and applied RANSAC to track soft robots.
- Tested tracking algorithm on small datasets collected on one soft robot and validated tracking performance qualitatively.
- Applied Deep Q-Learning to learn a soft robot control policy and built a hardware system to validate the control policy.

TEACHING & SERVICE

Conference Reviewer: ICRA 2022
Teaching: Honor Physics I, Honor Calculus II, and Random Processes