Jiaming Hu

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MAIN RESEARCH FOCUS

Multi-Modal Motion Planning in high Dimensional Space, Reliable Manipulation Planning, Task and Motion Planning with LLM/VLM

EDUCATION

B.S., M.S., and Ph.D. | UNIVERSITY OF CALIFORNIA, SAN DIEGO **09/2016-NOW**

- Major: Computer Science and Engineering
- Ph.D. Graduation Expectation in 2024

TECHNICAL STRENGTHS

Language: C/C++, Python, Java
Tools: OpenCV, PyTorch, OMPL, ROS1/2, IsaacLab/Sim, Git, Docker, Gazebo, CoppliaSim, Moveit! 1 and 2, Nav2, Curobo, Cuda
Prefered System: Ubuntu(Linux)

Publications

Jiaming Hu, Jan Szczekulski, Sudhansh Peddabomma, Henrik I. Christensen (2025). Planning for Tabletop Object Rearrangement. IEEE International Conference on Robotics and Automation (ICRA).
Jiaming Hu, Shrutheesh Iyer, Jiawei Wang, and Henrik I. Christensen (2024). Motion Planning in Foliated Manifolds using Repetition Roadmap Robotics: Science and Systems (RSS).
Shrutheesh Iyer, Anwesan Pal, **Jiaming Hu**, Akanimoh Adeleye, Aditya Aggarwal and Henrik I. Christensen (2023). Household navigation and manipulation for everyday object rearrangement tasks. International Conference on Robotic Computing (IRC).
J. Hu, Z. Tang, and H. Christensen, “Multi-Modal Planning on Regrasping for Stable Manipulation,” 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems(IROS), 2023
J. Hu, A Adeleye, and H. Christensen, “Place-and-Pick-Based Re-grasping Using Unstable Placement,” The International Symposium of Robotics Research, 2022
A. Adeleye, **J. Hu**, and H. Christensen, “Putting away the groceries with precise semantic placements,” 2022 IEEE 18th International Conference on Automation Science and Engineering (CASE), 2022
J. Hu, and H. Christensen, “Rotational Slippage Minimization in Object Manipulation,” 2022 IEEE 18th International Conference on Automation Science and Engineering (CASE), 2022
P Parashar, A Naik, **J Hu**, and H. Christensen, “A hierarchical model to enable plan reuse and repair in assembly domains,” 2021 IEEE 17th International Conference on Automation Science and Engineering (CASE), 2021

TEACHING EXPERIENCE

Introduction to Robotics, UCSD 10/2022-12/2022

- Teached embedded programming on RB5, planning, state estimation as TA.

PROJECT EXPERIENCE

1. Motion Planning Library Development with Cuda Programming 12/2024-now
Develop a motion planning library platform similar to OMPL but in parallel fashion with Cuda and C++, and achieve better performance compared to Curobo.

2. Task and Motion Planning with VLM and Foliated Planner 6/2024-now
Leverage VLM to generate task sequence and use foliated motion planner to generate actual motion to complete novel tasks.

3. Automatic Assembly System with UR5 9/2018-9/2019
Develop a complete-autonomous assembly system with UR5 arms and mainly work on 6D pose estimation and tracking on parts, Closed-loop impedance control of assembly process, and Behavior planning of assembly system.
For more information, please check the following papers:
“Lessons Learned Developing an Assembly System for WRS 2020 Assembly Challenge”
“Meta-Modeling of assembly contingencies and planning for repair”

“Pose estimation of specular and symmetrical objects”

4. Home-Robot for Rearrangement based on user preference 3/2023-now

Develop a rearranging system for in-door objects

- System integration Fetch Robot Platform.
- Developed stable grasping planning.
- Developed complex manipulations via RL such as drawer opening.
- Developed tabletop rearrangement planning.

5. Constrained Motion Planning Integration in Moveit! 9/2022-12/2022

Modified Moveit! source code to support constrained motion planning and integrated task and motion planning framework for foliated motion planning.