

Haonan Chang

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INTRODUCTION

I focus on developing and deploying foundation models, such as **LLMs**, **VLMs**, and **Video Diffusion Models**, for robotic **manipulation** and **navigation systems**. I also specialize in scene understanding, 3D reconstruction, and SLAM.

EDUCATION

2020 - present	Ph.D (CS) at Rutgers University	(GPA: 4.0/4.0)
2018 - 2020	M.S. (Robotics and ME) at University of Michigan	(GPA: 4.0/4.0)
2014 - 2018	B.S. (ME and Math) at Tsinghua University	(GPA: 3.7/4.0)

WORK EXPERIENCE

Research Scientist (Intern) at ByteDance June 2024 - Oct 2024

- Worked on deploying video diffusion models for long-horizon manipulation tasks.
- Contributed to a paper submission to CVPR2024.

Research Scientist (Intern) at MERL June 2023 - Dec 2023

- Developed a visual-force servoing system for robotic insertion tasks with novel digital parts under disturbances. Accuracy requirement for this task is under *1mm*.
- Published this work at IROS 2024 and secured a patent for the algorithm.

Applied Scientist (Intern) at Amazon Lab126 June 2022 - Sept 2022

- Collaborated with the SLAM team on Amazon's Astro robot, adding a plane-based local registration module to enhance the SLAM system's accuracy by *15%*.

SELECTED PUBLICATIONS

Here, we present a selection of publications. For a complete list, please visit my [home page](#).

- [1] Haonan Chang* et al. "A3VLM: Actionable Articulation-Aware Vision Language Model". In: *IEEE/RSJ International Conference on Intelligent Robots and Systems (CoRL 2024)* (2024)
Abstract: VLMs focus on understanding objects' affordances and articulation structures for manipulation. The object-centric representation of A3VLM allows it to integrate seamlessly with any manipulation hardware. [\[arXiv\]](#) [\[GitHub\]](#) [\[Video\]](#)
- [2] Haonan Chang et al. "LGMCTS: Language-Guided Monte-Carlo Tree Search". In: *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2024)* (2024)
Abstract: LLMs can generate semantically correct but non-executable plans. To address this, we combine them with a Monte Carlo Tree Search planner. Algorithm achieves *S.O.T.A* on multiple semantic rearrangement tasks. [\[arXiv\]](#) [\[GitHub\]](#) [\[Video\]](#)
- [3] Haonan Chang, Abdeslam Boularias, and Siddarth Jain. "Insert-One: One-Shot Robust Visual-Force Servoing for Novel Object Insertion with 6-DoF Tracking". In: *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2024)* (2024)

Abstract: A visual-force servoing-based system capable of inserting novel digital parts, even in the presence of disturbances. [\[Paper\]](#) [\[Video\]](#)

- [4] Haonan Chang et al. “DAP: Diffusion-based Affordance Prediction for Multi-modality Storage”. In: *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2024)* (2024)
Abstract: Diffusion-based affordance prediction to identify storable regions among multiple candidates. [\[arXiv\]](#) [\[GitHub\]](#)
- [5] Haonan Chang and et al. “Context-Aware Entity Grounding with Open-Vocabulary 3D Scene Graphs”. In: *2023 Conference on Robot Learning (CoRL 2023)* (2023)
Abstract: Constructing the scene as a scene graph with language features transforms the object-grounding problem into a graph search task. OVSG enables flexible language querying with contextual support. [\[arXiv\]](#) [\[GitHub\]](#) [\[Video\]](#)
- [6] Haonan Chang et al. “Mono-STAR: Mono-camera Scene-level Tracking and Reconstruction”. In: *2023 IEEE International Conference on Robotics and Automation (ICRA 2023)* (2023)
Abstract: The first real-time 3D reconstruction system that simultaneously supports semantic fusion, fast motion tracking, non-rigid object deformation, and topological change under a unified framework. [\[arXiv\]](#) [\[GitHub\]](#) [\[Video\]](#)
- [7] Haonan Chang and Abdeslam Boularias. “Scene-level Tracking and Reconstruction without Object Priors”. In: *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2022)* (2022)
Abstract: The first real-time system capable of tracking and reconstructing, individually, every visible object in a given scene, without any form of prior on the scene. [\[arXiv\]](#) [\[GitHub\]](#) [\[Video\]](#)

INVITED TALKS

2024 Aug Invited by Prof. Hao Dong at Peking University
2024 May Invited by Prof. Lifeng Zhou at Drexel University
2023 Dec Invited by Dr. Peng Gao at ShangHai AI Lab
2023 Oct Invited by Prof. Hang Yang at Harvard University

SKILLS

I have extensive experience in developing deep learning and robotics systems, with hands-on expertise in deploying various algorithms across different robotic platforms in real-world environments.

Code	Python, C++, CUDA, JavaScript, Pytorch, ROS.
Robot Platform	Kuka, Franka, UR5, Aloha, Fetch, Astros.
Robot Algorithm	Imitation Learning, Motion Planning, Task Planing, SLAM, Visual Servoing.

SERVICE

Paper Reviewer ICRA 2021, 2023 ISRR 2022, IEEE Transactions on Robotics, SIGGRAPH-Asia 2023, RSS 2023, ICRA 2024, CoRL 2024, ICRA2025