

Anxing Xiao

Adaptive Computing Laboratory

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RESEARCH INTERESTS

My research spans robotic system design, task and motion planning, and human-robot interaction. Currently, I focus on improving *open-world planning and interaction* for service robots performing *mobile manipulation* in home environments.

EDUCATION

National University of Singapore

Jan 2023 - present

Ph.D. student in Computer Science; Advisor: [Prof. David Hsu](#)

Harbin Institute of Technology, Shenzhen

Aug 2017 - Jun 2021

B.Eng. in Automation; Semester Visiting Student at UC Berkeley (2019 Fall - 2020 Summer)

EXPERIENCE

Adaptive Computing Lab & Smart Systems Institute, NUS

July 2023 - present

Graduate Research Assistant with [Prof. David Hsu](#)

Singapore

- Leading the research project of designing systems and algorithms for household robotic assistants. Designed MR remote multimodal interaction system ([P.9] ICRA'25) and long-horizon reasoning algorithm ([T.1]).
- Maintaining robotics infrastructure and conducting research collaborations within the Smart Systems Institute, including model training and real-world robot implementation. ([P.8] RSS'24, [P.11] CoRL'25, [P.12] CoRL'25, [P.13] CoRL'25).

Robotic Perception and Intelligence Lab, SUSTech & CUHK

July 2021 - June 2022

Research Assistant with [Prof. Max Q.-H. Meng](#)

Shenzhen, China

- Initiated the autonomous trolley collection robots research projects and built the 3D perception, planning, and control system for trolley collection robots from scratch. ([P.5] ICRA'22, [P.7] IROS'23)
- Mentored undergraduate students in robotics research projects. ([P.3] IROS'22, [P.6] ICRA'23, [P.10] RA-L)

Hybrid Robotics Lab, UC Berkeley

Mar 2020 - Mar 2021

Research Assistant with [Prof. Koushil Sreenath](#)

Berkeley, CA, USA

- Designed the first robotic guide dog system and the corresponding hybrid physical human-robot framework to assist humans in navigating through narrow spaces. ([P.3] ICRA'21)
- Contributed to the navigation stack in quadrupedal autonomous navigation with optimized jumping. ([P.2] CASE'21)

PUBLICATIONS

Peer-Reviewed Publications:

* denotes equal contribution, † denotes mentorship

- [13] C. Tang, **A. Xiao**, Y. Deng, T. Hu, W. Dong, H. Zhang, D. Hsu, H. Zhang, "MimicFunc: Imitating Tool Manipulation from a Single Human Video via Functional Correspondence", *Accepted to Conference on Robot Learning (CoRL)*, 2025. [Paper] [Video] [Code]
- [12] C. Hao, **A. Xiao**, Z. Xue, H. Soh, "CHD: Coupled Hierarchical Diffusion for Long-Horizon Tasks", *Accepted to Conference on Robot Learning (CoRL)*, 2025. [Paper] [Video] [Code]
- [11] J. Zhang, H. Zhang, **A. Xiao**, D. Hsu, "Robot Operation of Home Appliances by Reading User Manuals", *Accepted to Conference on Robot Learning (CoRL)*, 2025. [Paper] [Video] [Code]
- [10] S. Luo, J. Zhu, P. Sun, Y. Deng, C. Yu, **A. Xiao**[†], X. Wang, "GSON: A Group-based Social Navigation Framework with Large Multimodal Model", *Accepted to IEEE Robotics and Automation Letters (RA-L)*, 2025. [Paper] [Video] [Code]
- [9] **A. Xiao**, N. Janaka, T. Hu, A. Gupta, K. Li, C. Yu, D. Hsu, "Robi Butler: Multimodal Remote Interactions with a Household Robot Assistant", *International Conference on Robotics and Automation (ICRA)*, 2025. [Paper] [Video]
- [8] S. Yu, K. Lin, **A. Xiao**, J. Duan, H. Soh, "Octopi: Object Property Reasoning with Large Tactile-Vision-Language Models", *Robotics: Science and Systems (RSS)*, 2024. [Paper] [Website] [Code]
- [7] B. Xia, H. Luan, Z. Zhao, X. Gao, P. Xie, **A. Xiao**[†], J. Wang, and M. Q.-H. Meng, "Collaborative Trolley Transportation System with Autonomous Nonholonomic Robots", *International Conference on Intelligent Robots and Systems (IROS)*, 2023. [Paper] [Video]
- [6] Y. Chen, Z. Xu, Z. Jian, G. Tang, Y. Yangli, **A. Xiao**[†], X. Wang, and B. Liang, "Quadruped Guidance Robot for the Visually Impaired: A Comfort-Based Approach", *International Conference on Robotics and Automation (ICRA)*, 2023. [Paper] [Video]
- [5] **A. Xiao**^{*}, H. Luan^{*}, Z. Zhao^{*}, Y. Hong, J. Zhao, J. Wang, and M. Q.-H. Meng, "Robotic Autonomous Trolley Collection with Progressive Perception and Nonlinear Model Predictive Control", *International Conference on Robotics and Automation (ICRA)*, 2022. [Paper] [Video]
- [4] **A. Xiao**^{*}, W. Tong^{*}, L. Yang^{*}, J. Zeng, Z. Li, and K. Sreenath, "Robotic Guide Dog: Leading a Human with Leash-Guided Hybrid Physical Interactions", *International Conference on Robotics and Automation (ICRA)*, 2021. **Best Service Robot Paper Finalist**. [Paper] [Video] Media coverage: [Daily Mail] [New Scientist] [Tech Xplore] [Daily Californian] [Independent] [Futurism] [China Daily] [DeepTech (Chinese)]

- [3] Z. Jian, Z. Lu, X. Zhou, B. Lan, **A. Xiao**[†], X. Wang, and B. Liang, "PUTN: A Plane-fitting based Uneven Terrain Navigation Framework", *International Conference on Intelligent Robots and Systems (IROS)*, 2022. [\[Paper\]](#) [\[Code\]](#)
- [2] S. Gilroy, D. Lau, L. Yang, E. Izaguirre, K. Biermayer, **A. Xiao**, M. Sun, A. Agrawal, J. Zeng, Z. Li, and K. Sreenath, "Autonomous Navigation with Optimized Jumping through Constrained Obstacles on Quadrupeds", *International Conference on Automation Science and Engineering (CASE)*, 2021. [\[Paper\]](#) [\[Video\]](#) Media coverage [\[Video Friday\]](#)
- [1] Y. Wu, **A. Xiao**, H. Chen, S. Zhang, Y. Liu, "Amphibious Robot's Trajectory Tracking with DNN-Based Nonlinear Model Predictive Control", *International Conference on Advanced Intelligent Mechatronics (AIM)*, 2020. [\[Paper\]](#)

Technical Report (Preprint):

- [1] S. Chen, **A. Xiao**, D. Hsu, "LLM-State: Expandable State Representation for Long-horizon Task Planning in the Open World", [\[Paper\]](#) [\[Video\]](#)

SELECTED AWARDS AND HONORS

- NUS Research Scholarship 2023
- **Best Paper Award Finalist for Service Robotics at ICRA '21** 2021
- Dean's Award at HITsz. 2021
- First-class Undergraduate Academic Scholarship. 2018-2021
- National Scholarship. 2018

PROFESSIONAL RESPONSIBILITIES

- *Journal Reviewing*: IEEE T-RO, IEEE RA-L, IEEE T-IE, IEEE T-ASE.
- *Conference Reviewing*: ICRA '22 '23 '24 '25, IROS '22 '24 '25, CoRL '25.
- *Mentorship*
 - Zhengzhe Xu [P.6], Now PhD Student @ HKU 2021 - 2022
 - Yanbo Chen [P.6], Now MS Student @ Tsinghua Univ. 2021 - 2022
 - Xiao Zhou [P.3], Now MPhil Student@ HKUST 2021 - 2022
 - Shangyi Luo [P.10], Now MS Student@ NUS 2024 - 2025
- *Teaching Assistantship*
 - NUS CS2109S Introduction to AI and Machine Learning Spring 2024
 - NUS CS6244 Advanced Topics in Robotics Spring 2025
- *Student Area Search Committee*: School of Computing, National University of Singapore Spring 2025

REFERENCES

- **Prof. David Hsu (IEEE Fellow).**
Provost's Chair Professor.
Department of Computer Science. National University of Singapore.
Relationship: PhD supervisor.
Email: dyhsu@comp.nus.edu.sg
- **Prof. Max Q.-H. Meng (IEEE Fellow).**
Department head, Chair Professor.
Department of Electrical and Electronic Engineering, Southern University of Science and Technology
Relationship: RA supervisor.
Email: max.meng@ieee.org
- **Prof. Koushil Sreenath.**
Associate Professor.
Department of Mechanical Engineering, University of California, Berkeley.
Relationship: RA supervisor.
Email: koushils@berkeley.edu

SKILLS

- **Programming**: Python, C/C++, MATLAB, HTML
- **Softwares & Tools**: ROS, PyTorch, CasADi, OpenCV, LCM, Solidworks, Gazebo, Git, LaTeX
- **Hardware**: Multiple Motors and Sensors, Arduino, Raspberry Pi, Basic Mechanical Design