

# Anxing Xiao

Adaptive Computing Laboratory

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## RESEARCH INTERESTS

My research topics cover reasoning, motion planning, and human-robot interaction. Currently, I am focused on enhancing *open-world planning and interaction* capabilities for service robots to perform *mobile manipulation* in domestic 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, GPA: 93.08/100 (Ranking 1/70)

Semester Visiting Student at UC Berkeley (2019 Fall - 2020 Summer), GPA: 3.93/4

## 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.3] ICRA'25) and long-horizon reasoning algorithm ([R.1]).

- Maintaining robotics infrastructure and conducting research collaborations between groups within the Smart Systems Institute, including tactile-language models ([C.8] RSS'24), appliance operation ([P.3]), and tool manipulation ([P.2]).

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. ([C.5] ICRA'22, [C.7] IROS'23)

- Mentored undergraduate students in research projects related to autonomous robots. ([C.3] IROS'22, [C.6] ICRA'23, [P.1])

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. ([C.3] ICRA'21)

- Contributed to the navigation stack in quadrupedal autonomous navigation with optimized jumping. ([C.2] CASE'21)

## PUBLICATIONS

### Conference:

\* denotes equal contribution, † denotes mentorship

- [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**<sup>†</sup>, 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**<sup>†</sup>, 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**<sup>\*</sup>, H. Luan<sup>\*</sup>, Z. Zhao<sup>\*</sup>, 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**<sup>\*</sup>, W. Tong<sup>\*</sup>, L. Yang<sup>\*</sup>, 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**<sup>†</sup>, 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. [\[Paper\]](#)

#### Preprint:

- [4] C. Hao, **A. Xiao**, Z. Xue, H. Soh, "CHD: Coupled Hierarchical Diffusion for Long-Horizon Tasks", *In submission*. [\[Paper\]](#) [\[Video\]](#)
- [3] J. Zhang, H. Zhang, **A. Xiao**, D. Hsu, "Robot Operation of Home Appliances by Reading User Manuals", *In submission*. [\[Paper\]](#) [\[Video\]](#)
- [2] C. Tang, **A. Xiao**, Y. Deng, T. Hu, W. Dong, H. Zhang, D. Hsu, H. Zhang, "FUNCTO: Function-Centric One-Shot Imitation Learning for Tool Manipulation ", *In submission*. [\[Paper\]](#) [\[Video\]](#) [\[Website\]](#)
- [1] S. Luo, J. Zhu, P. Sun, Y. Deng, C. Yu, **A. Xiao**<sup>†</sup>, X. Wang, "GSON: A Group-based Social Navigation Framework with Large Multimodal Model ", *In submission*. [\[Paper\]](#) [\[Video\]](#)

#### Technical Report:

- [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

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- 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

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- *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 [C.6], Now PhD Student @ HKU 2021 - 2022
  - Yanbo Chen [C.6], Now MS Student @ Tsinghua Univ. 2021 - 2022
  - Xiao Zhou [C.3], Now MPhil Student@ HKUST 2021 - 2022
  - Shangyi Luo [P.1], 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

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- **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

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- **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