Hongbin (Ben) Lin

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Education

The Chinese University of Hong Kong *2020-2025*

Ph.D. Robotics Mechanical and Automation Engineering Department Hong Kong

- Tutor: Prof. Kwok Wai Samuel Au Homepage
- Research Area: World-model-based Visuomotor Learning, Non-isometric equivariant data augmentation, robotic grasping, surgical autonomy, robotic system identification and gravity compensation.

The Chinese University of Hong Kong *2017-2018*

M.Sc. Mechanical and Automation Engineering Hong Kong

Guangdong University of Technology *2013-2017*

B.S. Mechanical and Automation Engineering Guangzhou

Working Experience

The Chinese University of Hong Kong *2018-2020*

Research Assistant (Tutor: Kwok Wai Sameul Au) Hong Kong

Publication

1. **Hongbin Lin**, Bin Li, Kwok Wai Samuel Au, "Visuomotor grasping with world models for surgical robots," *International Journal of Research and Review (IJRR)*, 2025, (under review). [PDF]
   - Propose a world-model-based visuomotor learning framework for grasping tasks of surgical robots
2. **Hongbin Lin**, Juan Rojas, Kwok Wai Samuel Au, "Multi-group equivariant augmentation for reinforcement learning in robot manipulation," *Transaction on Robotics (TRO)*, 2025, (under review). [PDF]
   - Propose a non-isometric equivariant data augmentation to improve sampling efficiency of visuomotor learning
3. **Hongbin Lin**, Bin Li, Kwok Wai Samuel Au, "World models for general surgical grasping," *Robotics: Science and Systems (RSS)*, 2024. [PDF] [Project]
4. **Hongbin Lin**, Bin Li, Xiangyu Chu, Qi Dou, Yunhui Liu, Kwok Wai Samuel Au, "End-to-end learning of deep visuomotor policy for needle picking," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023. [PDF] [Project]
5. **Hongbin Lin**, Qian Gao, Xiangyu Chu, Qi Dou, Anton Deguet, Peter Kazanzides, Kwok Wai Samuel Au, "Learning deep nets for gravitational dynamics with unknown disturbance through physical knowledge distillation: initial feasibility study," *IEEE Robotics and Automation Letters (RAL)*, 2021 (presented in 2021 ICRA). [PDF] [Project]
6. **Hongbin Lin**, Chiu-Wai Vincent Hui, Yan Wang, Anton Deguet, Peter Kazanzides, Kwok Wai Samuel Au, "A reliable gravity compensation control strategy for dVRK robotic arms with nonlinear disturbance forces," *IEEE Robotics and Automation Letters (RAL)*, 2019 (presented in 2019 IROS). [PDF] [Project]
   - Propose a gravity compensation method for surgical manipulators with strong disturbances; open-source code is used

in 40 institutions worldwide.

7. Yonghao Long, Anran Lin, Derek Hang Chun Kwok, Lin Zhang, Zhenya Yang, Kejian Shi, Lei Song, Jiawei Fu, **Hongbin Lin**, Wang Wei, Kai Chen, Xiangyu Chu, Yang Hu, Hon Chi Yip, Philip Wai Yan Chiu, Peter Kazanzides, Russell H Taylor, Yunhui Liu, Zihan Chen, Zerui Wang, Kwok Wai Samuel Au, Qi Dou, "Surgical embodied intelligence for generalized task autonomy in laparoscopic robot-assisted surgery," *Science Robotics (SR)*, 2025. [PDF]
8. Bin Li, Bo Lu, **Hongbin Lin**, Yaxiang Wang, Fangxun Zhong, Qi Dou, Yun-Hui Liu, "On the Monocular 3-D Pose Estimation for Arbitrary Shaped Needle in Dynamic Scenes: An Efficient Visual Learning and Geometry Modeling Approach," *IEEE Transactions on Medical Robotics and Bionics*, 2024. [PDF]
9. Hongmin Wu, **Hongbin Lin**, Yisheng Guan, Kensuke Harada, Juan Rojas, "Robot introspection with bayesian nonparametric vector autoregressive hidden markov models," *2017 IEEE-RAS 17th International Conference on Humanoid Robotics (Humanoids)*, 2017. [PDF]
10. Yan Wang, Hoi-Wut Yip, Hao Zheng, **Hongbin Lin**, Russell H Taylor, Kwok Wai Samuel Au, "Design and experimental validation of a miniaturized robotic tendon-driven articulated surgical drill for enhancing distal dexterity in minimally invasive spine fusion," *IEEE/ASME Transactions on Mechatronics (T-Mech)*, 2022. [PDF]
11. Juan Rojas, Shuangqi Luo, Dingqiao Zhu, Yunlong Du, **Hongbin Lin**, Zhengjie Huang, Wenwei Kuang, Kensuke Harada, "Online robot introspection via wrench-based action grammars," *2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2017. [PDF]
12. **Hongbin Lin**, Bin Li, Yunhui Liu, Kwok Wai Samuel Au, "Open-source high-precision autonomous suturing framework with visual guidance," *IEEE Int. Conf. Intell. Robots and Syst. (IROS) Workshop on "A Panacea Or An Alchemy? Benefits And Risks Of Robot Learning In Medical Applications''*, 2022. [PDF] [Project]

Adward

- Golden Award, The 9th China International College Students' “Internet+” Innovation and Entrepreneurship Competition [Media]
- Top Prize, 17th “Challenge Cup” National College Students’ Extracurricular Academic Science and Technology Contest [Media]
- Runner-up and Second Runner-up, Charles K. Kao Student Creativity Awards
- First Place Winner, AccelNet Surgical Robotics Challenge

Teaching

- **The Chinese University of Hong Kong** MAEG3080 Fundamentals of Machine Intelligence
- **The Chinese University of Hong Kong** MAEG2050 Robot Development in Practice: From Design to Prototyping

Skill

Profile Summary

A highly skilled researcher with over seven years of experience in robotics, specializing in independent algorithm development and the publication of research in top-tier journals. Demonstrates strong communication, collaboration, and presentation skills with a proven track record of delivering impactful results in multidisciplinary teams.

Language

Cantonese (Native), Mandarin (Fluent), English (Proficient)

Programming Language

C/C++, MATLAB, Python