Yulin Li

The Hong Kong University of Science and Technology (HKUST)
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Research Interest

Robot Motion Planning & Control, Optimization

Education

The Hong Kong University of Science and Technology — Hong Kong, China
Ph.D. Student in Robotics and Autonomous Systems — *Sep. 2021 – Present*
Supervised by **Prof. Jun Ma** and **Prof. Michael Yu Wang**

Harvard University — Cambridge, MA, USA
Visiting Scholar in Computational Robotics Lab — *Sep. 2024 – Mar. 2025*
Supervised by **Prof. Heng Yang**

University of California, San Diego — San Diego, CA, USA
M.Sc. in Mechanical and Aerospace Engineering **GPA: 4.0/4.0** — *Sep. 2019 – Jun. 2021*
Major in: Motion Planning and Control for Robotics

Tongji University — Shanghai, China
B.Eng. in Mechatronic Engineering **GPA: 4.7/5.0** — *Sep. 2015 – Jun. 2019*

Honors & Awards

Best Poster Award Finalist, 2024 Workshop on Robot Technology for Sustainable Society — *Dec. 2024*
Robotica Best Paper Award Finalist, ROBIO 2023 — *Dec. 2023*
Shanghai Excellent Graduated Student — *Jun. 2019*
Shanghai Scholarship — *May. 2018*
RoboMasters National College Student Robot Competition 1st Prize Top 9% — *May. 2018*
Shanghai College Student Mechanical Engineering Innovation Competition 1st Prize — *Apr. 2017*
China Undergraduate Mathematical Contest in Modeling 1st Prize Top 0.82% — *Oct. 2017*

Research & Internship

HKUST: Robot Motion Planning and Control Lab

- Advised by **Professor Jun Ma and Professor Michael Yu Wang**
- Developing geometry-aware safety-critical controller and trajectory optimization algorithms for robot navigation in unknown and complex environments.
- In charge of the research development of the motion planning & control system of a mobile manipulator to achieve safe motion and dexterous manipulation in cluttered indoor environments.

Harvard University: Computational Robotics Lab

- Advised by **Professor Heng Yang**
- Conducting research on contact-implicit motion planning problems, developing high-performance numerical solvers for nonlinear programming with complementarity constraints.

Tencent Holding Ltd: Robotics X Lab

- Advised by **Professor Zhengyou Zhang**
- Build a single leg hopping platform to conduct experiments on new designs of the actuator and leg structure.

Carnegie Mellon University Robotics Institute

- Advised by **Professor Howie Choset**
- Carried out snake robot motion planning and adaptive control.

Publications

[1] **Y. Li**, H. Han, S. Kang, J. Ma, H. Yang, "On the Surprising Robustness of Sequential Convex Optimization for Contact-Implicit Motion Planning," ***Robotics: Science and Systems (RSS) 2025, submitted***.

[2] **Y. Li**, C. Zheng, K. Chen, Y. Xie, X. Tang, M. Y. Wang, and J. Ma, "Collision-Free Trajectory Optimization in Cluttered Environments with Sums-of-Squares Programming," ***IEEE Robotics and Automation Letters, 2024***.

[3] **Y. Li**, X. Tang, K. Chen, C. Zheng, H. Liu, and J. Ma, "Geometry-Aware Safety-Critical Local Reactive Controller for Robot Navigation in Unknown and Cluttered Environments," ***IEEE Robotics and Automation Letters, 2024***.

[4] **Y. Li**, Z. Song, C. Zheng, Z. Bi, K. Chen, M. Y. Wang and J. Ma, "FRTree Planner: Robot Navigation in Cluttered and Unknown Environments with Tree of Free Regions," ***IEEE Robotics and Automation Letters, 2025***.

[5] C. Zheng, **Y. Li** (co-first), Z. Song, Z. Bi, J. Zhou, B. Zhou, J. Ma, 'Local Reactive Control for Mobile Manipulators with Whole-Body Safety in Complex Environments," ***IEEE Robotics and Automation Letters, 2025***.

[6] K. Chen, H. Liu, **Y. Li**, J. Duan, L. Zhu, and J. Ma, "Robot navigation in unknown and cluttered workspace with dynamical system modulation in starshaped roadmap," ***IEEE International Conference on Robotics and Automation (ICRA), 2025***.

[7] Y. Wang, **Y. Li**, Z. Peng, H. Ghazzai, and J. Ma, "Chance-Aware Lane Change with High-Level Model Predictive Control Through Curriculum Reinforcement Learning," ***IEEE International Conference on Robotics and Automation (ICRA), 2024***.

[8] H. Liu, Z. Huang, Z. Zhu, **Y. Li**, S. Shen, and J. Ma, "Improved Consensus ADMM for Cooperative Motion Planning of Large-Scale Connected Autonomous Vehicles with Limited Communications," ***IEEE Transactions on Intelligent Vehicles, 2024***.

[9] Z. Cheng, **Y. Li** (co-first), K. Chen, J. Duan, J. Ma, and T. H. Lee, "Neural-iLQR: A Learning-Aided Shooting Method for Trajectory Optimization," ***IEEE International Conference on Robotics and Biomimetics (ROBIO), 2023***.

[10] H. Liu, K. Chen, **Y. Li**, Z. Huang, J. Duan, and J. Ma, "Integrated Decision-Making and Control for Urban Autonomous Driving with Traffic Rules Compliance," ***IEEE International Conference on Robotics and Biomimetics (ROBIO), 2023***.

[11] H. Liu, K. Chen, **Y. Li**, Z. Huang, and J. Ma, "UDMC: Unified Decision-Making and Control Framework for Urban Autonomous Driving with Motion Prediction of Traffic Participants," ***IEEE Transactions on Intelligent Transportation Systems, 2025.***

[12] K. Chen, J. Cao, **Y. Li**, J. Ma, "G2-SDF: Geometry-Guided Neural Signed Distance Fields for Scalable and Detailed Reconstruction,", ***IEEE Robotics and Automation Letters,*** **submitted.**

[13] J. Cao, Q. Zhang, J. Sun, J. Wang, H. Cheng, **Y. Li**, J. Ma, Yecheng Shao, Wen Zhao, G. Han, Y. Guo, R. Xu, "Mamba Policy: Towards Efficient 3D Diffusion Policy with Hybrid Selective State Models,", ***International Conference on Intelligent Robots and Systems (IROS), 2025,*** **submitted.**

[14] Z. Bi, K. Chen, C. Zheng, **Y. Li**, H. Li, J. Ma, "Interactive Navigation for Legged Manipulators with Learned Arm-Pushing Controller,", ***International Conference on Intelligent Robots and Systems (IROS) 2025,*** **submitted.**

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