Yulin Li

Tel: +86 17717092075 | Email: yline@connect.ust.hk

Research Interest

Robot Motion Planning & Control, Optimization

Education

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

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**

University of California, 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

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

Harvard University: Computational Robotics Lab — *Sep. 2024 – Mar. 2025*

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

HKUST Shenzhen-Hong Kong Collaborative Innovation Research Institute — *Dec. 2022 – Present*

- Advised by **Professor Michael Yu Wang**
- 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.

Tencent Holding Ltd: Robotics X Lab — *Jul. 2020 – Oct. 2020*

- 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 — *Jul. 2018 – Sep. 2018*

- 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," ***arXiv preprint, 2025***.

[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," *2023 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] 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,", ***arXiv preprint, 2024***

[12] 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, under review***.

[13] Z. Bi, K. Chen, C. Zheng, **Y. Li**, H. Li, J. Ma, "Interactive Navigation for Legged Manipulators with Learned Arm-Pushing Controller,", ***arXiv preprint, 2025***

References

Prof. Jun Ma
Department of Electronic and Computer Engineering
The Hong Kong University of Science and Technology
Email: jun.ma@ust.hk

Prof. Xindong Tang
Department of Mathematics
Hon Kong Baptist University
Email: xdtang@hkbu.edu.hk

Prof. Heng Yang
School of Engineering and Applied Sciences (SEAS)
Harvard University
Email: hankyang@seas.harvard.edu

Prof. Michael Yu Wang
School of Engineering
Great Bay University
Email: mywang@gbu.edu.cn