Yulin Li

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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*
- The Lab is under the supervision of **Professor Zhengyou Zhang**
- Studied the principle of motion of legged robots and review the literature of some cutting edge quadruped.
- Learnt the open source model and algorithm of MIT Cheetah and Standford Doggo.
- In charge of building a single leg hopping platform (mechanical and electronic hardware) to conduct experiments on new designs of the actuator and leg structure.
- Worked on the simulation of Xleopard, calibrate for its dynamic parameters, develop and implement MPC algorithm for it. (Xleopard is a quadruped under development in the lab).
- Re-implemented the open-source Standford Doggo Project, play with it and redesign the transmission structure to solve the problem of belt slipping and reduce the whole weight of the robot. Add two half wheels to the leg links so that the robot could move with them besides hopping after transforming its structure.

Carnegie Mellon University Robotics Institute *Jul. 2018 − Sep. 2018*

- Biorobotics Lab (Snake Robots Lab) Visiting Scholar, advised by **Professor Howie Choset**
- Carried out snake robot motion planning and adaptive control.
- Created new behaviors and modified existing gaits on snake robot to achieve the goal of climbing through a "T" Shape junction like a pipe with Matlab and ROS.
- Established 3D simulation snake in Matlab and integrated the snake robot in VREP.
- Authored a "snake robot tutorial" including self-research summary, basic knowledge and a literature review.

Selected 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**, 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*.