ZHAOTING LI

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Educations & Work Experiences	
ETH Zurich	Zurich, Switzerland
Master in Robotics, System and Control program	Sept 2021— present
Southern University of Science and Technology (SUSTech)	Shenzhen, China
Research assistant at Department of Electrical and Electronic Engineering	July 2020—July 2021
Harbin Institute of Technology (HIT)	Harbin, China
Bachelor of Engineering (Automation), School of Astronautics	Sept 2016—June 2020
GPA: 95.65 / 100 (major) Ranking: 3 /156	
University of California, Berkeley	Berkeley, USA
Visiting student researcher at Mechanical Systems Control Lab	July 2019—Sept 2019

Publications

- Z. LI, T. Li, J. Wang, M. Q.-H. Meng, Learning Robot Exploration Strategy with 4D Point-Clouds-like Information as Observations, IEEE Robotics and Automation Letters, vol. 7, no. 1, pp. 1-8, Jan. 2022.
- Z. LI, J. Wang, M. Q.-H. Meng, Efficient Heuristic Generation for Robot Path Planning with Recurrent Generative Model, 2021 IEEE International Conference on Robotics and Automation (ICRA), pp. 7386-7392.
- Z. LI, W. Zhan, L. Sun, C. Chan, M. Tomizuka, Adaptive sampling-based motion planning with a nonconservatively defensive strategy for autonomous driving, 2020 IFAC World Congress, Volume 53, Issue 2, 2020, Pages 15632-15638.
- Y. Yang, Z. LI, X. Yu, Z. LI, H. Gao, A Trajectory Planning Method for Robot Scanning System Using Mask R-CNN for Scanning Objects with Unknown Model, Neurocomputing, Volume 404, 2020, pp. 329-339.

Research Experiences

Learning Muti-Robot Exploration Strategy with Adaptive-QMIX algorithm Oct 2021—Current

- Advisor: Ali Batuhan Yardim, Prof. Niao He, Department of Computer Science, ETH Zurich
- Developed the simulation environment for muti-robot exploration.
- Proposed the adaptive-QMIX method which can be adaptive to various total robot number.
- Applied the proposed algorithm to muti-robot exploration problem.

Learning Robot Exploration Strategy with Deep Reinforcement Learning Dec 2020—July 2021 Advisor: Prof. Max O.-H. Meng, Department of Electrical and Electronic Engineering, SUSTech

Advisor: Prof. Max Q.-H. Meng, Department of Electrical and Electronic Engineering, SUSTech
Proposed 4D point clouds like information, which consists of 2D points' location information, and

- Proposed 4D point-clouds-like information, which consists of 2D points' location information, and the corresponding 1D frontier and 1D distance information.
- Designed the corresponding training framework based on the deep Q-Learning method and modified it to adapt to variable action space.
- Demonstrated the performance of the proposed method on a wide variety of environments, which the model has not seen before, and includes maps whose size is much larger than maps in the training set.

Efficient Heuristic Generation for Robot Path planning

Advisor: Prof. Max Q.-H. Meng, Department of Electrical and Electronic Engineering, SUSTech

- Designed a novel recurrent generative model to generate efficient heuristic for robot path planning.
- Incrementally constructed the heuristic through the feedback of historical information.
- Combined the generated heuristic with RRT* algorithm to guide the algorithm to find both initial and optimal solutions in a faster and more efficient way.
- A sampling-based motion planning method for urban autonomous vehicles July 2019—Jan 2020 Advisor: Prof. Masayoshi Tomizuka, Department of Mechanical Engineering, UC Berkeley
- Applied the discrete elastic-band-based motion planning method(EB planner) to generate piecewise linear collision-free path with dynamic programming. Employed pure pursuit controller to smooth this path.
- Used a spatial and speed sampling method together with a cascaded ranking method to optimize the trajectory with many hierarchical features.
- Applied a non-conservatively defensive strategy to avoid overreacting to threats with low probability.
- Adaptively adjust sampling resolution based on the environment and the objectives of the ego vehicle.

Path planning for a laser scanning robot system

Advisor: Prof. Huijun Gao, Research Institute of intelligent control and systems, Department of Automation, HIT

- Designed an automatic and low-cost robot scanning system consisting of a kinect camera, a UR 10 robot and a line laser scanner. Also unified the coordinate systems.
- Proposed an online correction methods based on follow-up control and scanned data to optimize the pose of the laser scanner.
- Proposed a novel path planning methods for laser scanning based on the least square fitting and online correction. This path planning method has been validated in many use cases under various work conditions.

Awards and Honors

Top Ten Learning Stars at Harbin Institute of Technology (Top 1%, 10/3975)	2019
Provincial-Level Merit Student (Top 1%, 5/500)	2019
The national second price in the NXP CUP intelligent car competition (China)	2018
National Scholarship (Top 2%, 8/500)	2018
National Scholarship (Top 2%, 8/500)	2017

Skills

Application: Robot Operating System (ROS); SOLIDWORKS; Altium Designer; IAR Embedded Workbench Programming: C; C++; Python; MATLAB

Volunteer Work

Peer support, School of Aeronautics	Sept 2016—present
Guided students with learning difficulties to study	
• Did lectures on the summary of the final exam knowledge points	
Cloud Classroom, Transmit Childhood Education	Mar 2017—June 2017
Delivered ten science classes for fifth graders	
• Given elementary school students a vivid and interesting explanation of physics, chem	nistry, robotics,
aerospace and other knowledge	

July 2020—Oct 2020

Feb 2019—June 2019