Ziqi Hu

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http://github.com/huziqi

EDUCATION

2020 M.S. in Control Science and Engineering, Nankai University, GPA: 3.87/4.0

- Supervisor: Prof. Jing Yuan. His current research interests include robotic control, motion planning, and simultaneous localization and mapping.

2016 B.Eng. in Intelligence Science and Technology, Nankai University, GPA: 3.75/4.0

PUBLICATIONS

[1] Z. Hu, J. Yuan, "NALO-SLAM: Navigation-Oriented LiDAR-guided Monocular SLAM for Mobile Robots", IEEE Robotics and Automation Letters (RA-L, under review).

[2] Z. Hu, Z. Fan, C. Liu, Y. Wu and C. Wang, "Geometrical Patterns Based Cross-scale Image Registration for AFM and Optical Microscopy", 2019 IEEE International Conference on Manipulation, Manufacturing and Measurement on the Nanoscale (3M-NANO), 2019, pp. 276-280.

[3] Z. Hu, J. Yuan, Y. Gong, S. Yu, X. Zhang, Reconstruction of Lead Wires of Power Lines for Live-line Working Robots in Distribution Networks, Control Engineering of China, 2021, 28(11):2123-2130.

[4] Y. Wu, Y. Fang, Z. Fan, C. Wang, C. Liu, Z. Hu, Cross-scale Image Registration Based on Geometric Feature Similarity Evaluation for Atomic Force Microscope and Optical Microscope, Control Theory & Applications, 2020, 37(09): 1913-1922.

RESEARCH EXPERIENCES

01/2022 – 09/2022 **Semantic perception and interactive cooperation of robots in limited-visibility environments with cross-spectral multi-sensor information fusion**

Natural Science Foundation of China: U21A20486, 01/2022-12/2025

- Sub-subject: NALO-SLAM: Navigation-aware LiDAR-guided Monocular SLAM for Mobile Robots.
- Description: The proposed work sloves the problems of building a semi-dense map used for moblie robots navigation and scale recovery in large-scale environments, which utilizes a major-plane mask learned from 3D LiDAR guidance. The experiment results show that the proposed work obtains an much better performance in localization than ORB-SLAM2 and DSO, and outperforms the traditional indirect and direct SLAM work in map building.

03/2021 – 06/2021 **Environment Perception for Live-line Working Robots in Distribution Networks**

Cooperated project with State Grid Corporation of China

- Description: Automatic lead wires replacement on self-designed robotic platform with 3D LiDAR.
- Major work:
  (1) 3D curve fitting of lead wires: A new curve fitting method is porposed based on the self-organizing hierarchical particle swarm optimization (SOH-PSO) and control point iterative optimization (CPIO), which solves the problem of reconstructing precise curve equation under the low resolution LiDAR scans and noises.
  (2) Recognition of pole cross arm based on geometrical features of 3D point clouds.

08/2018 – 09/2018 **Internship of National Institute of Informatics of Japan and Tamagawa University**

Tokyo, Japan

- In participation of development on SIGVerse platform for robot simulation under the guidance of Prof. Inamura, accumulating a wealth of experience on Unity simulation development.
- In Prof. Hiroyuki Okada's lab, I learned how to develop Tokyo HSR robot, and visual perception techniques based on point clouds.

12/12/2017 – 12/18/2017 **RoboCup Asia-Pacific 2017**

Bangkok, Thailand

- Team leader; Champion of RoboCup@Home Open Platform League.
- I was in charged of navigation part development based on ROS platform, achieving body following, fixed point navigation and speech interaction of the robot. The code has opened at https://github.com/huziqi/2017-AP_RoboCup-Turtlebot.git.

Honors & Awards

- Nomination for Best Application Paper Award of 2019 IEEE International Conference on 3M-NANO.
- Scholarship of "Gong-Neng" (First Prize), College of Artificial Intelligence, Nankai University, 2017.
- Scholarship of Postgraduate Freshman, College of Artificial Intelligent, Nankai University, 2020.
- Champion of RoboCup Asia-Pacific in RoboCup@Home Open Platform League and Education Challenge League, 2017.
- Excellent award of undergraduate program, 2020.

Professional Skills

- Familiar with pytorch and other deep learning tools.
- Experienced at developing under Ubuntu and ROS platform. The major programming language is C++/Python.
- Familiar with common libraries (e.g. Eigen, OpenCV, PCL, Ceres) and Git.