

Haizhou Zhang

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🐙 Github

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Education

- 2021 – 2024
- 📖 **M.Sc. University Of Turku**, Finland, Information and Communication Technology.
 - 📖 **M.Sc. Fudan University**, China, Information and Communication Technology.
In the graduate entrance examination, I ranked first among over 200 students accepted by the School of Information Science and Technology, Fudan.
- 2016 – 2020
- 📖 **B.Eng. Sun Yat-Sen University**, Telecommunication Engineering.

Skills

- Coding 📖 C++, Python, Java, \LaTeX , Linux, ...
- Robotics 📖 ROS, ROS 2, Sensor Fusion(Camera, Lidar, Radar), Kalman Filter, Probabilistic Robotics, PCL, PID, ...
- Machine Learning 📖 NLP, ANN, CNN, Federated Learning, Pytorch, CUDA, ...
- Other Subjects 📖 Signals and Systems, Principle of Communication, HDL, Digital Signal Processing, Computer Network, ...



Languages

- Chinese 📖 Mother Tongue
- English 📖 Proficient

Projects



- 2023
- 📖 **Lidar-generated Images Derived Keypoints Assisted Point Cloud Registration Scheme in Odometry Estimation**
This study implemented a variety of popular feature detectors, established special evaluation criteria, and sought detectors suitable for LiDAR-generated images. The feature points identified in the images were projected into the point cloud, and various ICP algorithms were used to construct an odometry.
 - 📖 **Review and Implementation of Calibration Algorithms for Lidar and Cameras**
This project aimed to research the process of calibration for Lidar and camera systems. By reviewing extensive literature, I compiled more than 20 calibration methods of Lidar and camera on github, for several of these methods, I delved into the source code and implemented them to gain a deeper understanding.
 - 📖 **Sensor Fusion Nanodegree**
An online sensor fusion programme, where I had to study and code for five projects, including segmentation and clustering of LiDAR point clouds; feature detection in images; obstacle avoidance and object tracking by cameras; calibration of images and point clouds; implementation of basic Radar concepts (FMCW, CFAR, AoA); Kalman filter fusion of LiDAR and Radar.
 - 📖 **Analysis of Different Weighting Methods in Federated Learning for Robot Obstacle Avoidance Algorithms**
This study investigated a key component in federated learning, aggregation mechanism, and set up a scenario of robotic visual obstacle avoidance, to compare the performance of different aggregation algorithms.

Projects (continued)



- 2022  **Self Driving Car Engineer Nanodegree**
An online degree by Udacity, which covered the core algorithms of the entire process of autonomous driving pipeline, including several code tasks: scan matching localization, motion planning and decision making, control and trajectory tracking, etc.
-  **Coordinate Tello and Jetbot to Complete A Search Mission**
A relatively simple course project involved controlling a Jetbot to construct a map using Cartographer and to move autonomously. When its camera located a target object, the system was able to plan a path for the Tello and control it to navigate to the designated location.

Publications


Journal Articles

- 1  **H. Zhang**, X. Yu, S. Ha, and T. Westerlund, "Lidar-generated images derived keypoints assisted point cloud registration scheme in odometry estimation," *Remote Sensing*, vol. 15, no. 20, 2023, ISSN: 2072-4292.
 DOI: 10.3390/rs15205074.





Conference Proceedings

- 1  **H. Zhang**, Q. Cheng, and X. Chen, "Aggregation mechanisms in federated learning for enhancing robotic visual obstacle avoidance," in *2023 5th International Conference on Robotics, Intelligent Control and Artificial Intelligence (RICAI)*, 2023, pp. 143–148.  DOI: 10.1109/RICAI60863.2023.10489056.

Employment History

- 2023.6 – 2023.8  **Research Assistant**, TIERS Lab, University of Turku.
During this internship, I primarily proposed a new point cloud odometry method by using keypoints derived from LiDAR-generated images. Additionally, I deeply explored methods for calibrating cameras and LiDAR.

Awards and Grants

- 2023  **Second Level Scholarship**, Fudan University, Shanghai, China.
- 2022  **Second Level Scholarship**, Fudan University, Shanghai, China.
- 2021  **Outstanding Student Scholarship**, Fudan University, Shanghai, China.
- 2019  **Outstanding Student Scholarship**, Sun Yat-Sen University, Guangzhou, China.

Other Education and Expertise

Professional Guitar Technician Certificate

- 2021  **Certified Advanced Guitar Craftsman**. Awarded by 9River Guitar Workshop.
- 2024  **Advanced Culinary Certification Program**. Awarded by New East Cuisine Education.