Yufeng Liu

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Education

Nanyang Technological University **Singapore**
M.Sc. in Computer Control and Automation *Aug.2024–present*

Harbin Institute of Technology(Shenzhen) **Shenzhen,China**
B.Eng. in Automation GPA:87/100 IELTS 6.5 *Sept.2020–Jun.2024*

Publications

[1] Degradation-Aware LiDAR-Thermal-Inertial SLAM. IEEE Robotics and Automation Letters(RA-L). (Under Review, **Co-First Author**) Y. Wang*, **Y. Liu***, L. Chen, H. Chen, and S. Zhang.

[2] Edge-based Monocular Thermal-Inertial Odometry in Visually Degraded Environments. IEEE Robotics and Automation Letters(RA-L), 8(4):2078-2085, 2023. Y. Wang, H. Chen, **Y. Liu**, and S. Zhang. [link]

Research Experiences

Thermal Camera Centered Multi Sensor SLAM in Challenging Environments **nROS-Lab,HITsz**
Oct.2021-Jun.2024

- Participated in the implementation and experiment of an Edge-Based Monocular Thermal-Inertial Odometry [publication].
  - Developed a simulation system in Ignition Gazebo for SLAM in complex extreme environments.
  - Deployed the algorithm in the real world and conducted experiments in the real world and datasets.
  - Skilled in thermal image processing.
  - Familiar with the system framework of VIOs like VINS-Mono, ORB-SLAM3, etc.
- Proposed a Degradation-Aware LiDAR-Thermal-Inertial SLAM [publication].
  - Designed a novel multi-sensor SLAM framework specially designed for sensor-degraded scenes.
  - Skilled in multi-sensor calibration.
  - Skilled in approaches to perform multi-sensor time synchronization.
  - Familiar with common multi-sensor SLAM frameworks like LVI-SAM, R2Live, R3Live, FAST-LIVO, etc.
  - (This project is my Final Year Project & Dissertation, which won the HITsz Outstanding Final Year Project & Dissertation Award)
- Participated in the implementation of a SLAM system integrated planning and dynamic obstacle avoidance.
  - Applied deep-learning method for target detection to optimize the LiDAR odometry.
  - Designed shared memory method for pointcloud data acceleration.

Teleoperated robot equipped with a VR remote-controlled gimbal system **nROS-Lab,HITsz**
Oct.2022–Sept.2023

- Designed a two-axis gimbal with sensors for mobile robots:
  - Designed the 3D model and implemented real-time embedded control.
  - Developed a framework for human-computer interaction, as well as a VR application.
  - Deployed Multi-sensor SLAM algorithm on the gimbal.

Awards

- Outstanding Final Year Project & Dissertation Award - Top2% of HITsz 2024
- First Prize of 2022 RoboMaster University Championship 2022
- Silver Prize of 13th Challenge Cup 2022
- First Prize of 2021 RoboMaster University Championship 2021
- Third Prize of China Undergraduate Mathematical Contest in Modelling 2021

- First Place among all students of Competition of the HITsz Robot Design and Practice Course 2020

Competition

Team leader of Sentry Robot Group in RoboMaster competition **Critical-HIT robot team,HITsz**
Oct.2020–Aug.2022

- Led the Sentry Robot Group in HITsz Critical-HIT RoboMaster Team.
  - Designed a fully automatic inspection and combat-integrated robot.
  - Coordinated task allocation and fostered collaboration among team members as team leader.
  - Responsible for embedded.
  - Developed target aiming algorithm framework, including target detection tracking.

Internship

Underwater grab robot control and navigation **Lujian Technology Ltd. Co.,Shenzhen**
May.2022–Dec.2022

- Participated in the design of an underwater robot
- Developed visual-inertial odometry and planning in underwater environments.
- Achieved a learning-based underwater target detection.

Skills

Programming: C++, C, Python, MATLAB

Software & tools: ROS, OpenCV, Gazebo, PCL, GTSAM, Ceres, Git, PyTorch, LaTeX, Qt Creator, Unity

Hardware: STM32, SolidWorks