Yingyu Wang

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Education

University of Technology Sydney — Sydney, Australia
Ph.D. student in Robotics, expected July 2025 — Jul. 2021 - Present

- Supervisor: Prof. Shoudong Huang and A/Prof. Liang Zhao
- Thesis Title: *Novel Non-feature Based SLAM: Joint Optimization of Non-feature Maps and Robot Trajectories*

Ocean University of China — Qingdao, China
Master in Computer Science — Sept. 2017 - Jun. 2020

- Supervisor: Prof. Junyu Dong
- Thesis Title: *Research and Application of Depth Estimation and Semantic Segmentation Algorithms for Agricultural UAVs*

Chengdu University of Technology — Chengdu, China
Bachelor in Computer Science — Sept. 2013 - Jun. 2017

Experience

The University of Edinburgh — Edinburgh, UK
Visiting Ph.D. Student, School of Informatics — Feb. 2025 - Present

- Topic: High-Fidelity 3D LiDAR Mapping for Autonomous Driving

University of Technology Sydney — Sydney, Australia
Teaching Assistant, School of Mechanical and Mechatronic Engineering — Aug. 2022 - Dec. 2024

- *Design Optimisation for Manufacturing* (UTS 49928)

Publications During Ph.D.

[1] **Y. Wang**, L. Zhao, and S. Huang, "Occupancy-SLAM: An Efficient and Robust Algorithm for Simultaneously Optimizing Robot Poses and Occupancy Map", *Conditionally Accepted by IEEE Transactions on Robotics (T-RO)*, to appear.

[2] **Y. Wang**, L. Zhao, and S. Huang, "Grid-based Submap Joining: An Efficient Algorithm for Simultaneously Optimizing Global Occupancy Map and Local Submap Frames", in *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2024, pp. 10 121–10 128.

[3] L. Zhao, **Y. Wang**, and S. Huang, "Occupancy-SLAM: Simultaneously Optimizing Robot Poses and Continuous Occupancy Map", in *Proceedings of Robotics: Science and Systems (RSS)*, New York City, NY, USA, Jun. 2022.

Other Publications

[1] **Y. Wang**, Y. Ju, M. Jian, K.-M. Lam, L. Qia, and J. Dong, "Self-supervised depth completion with attention-based loss", in *International Workshop on Advanced Imaging Technology (IWAIT) 2020*, SPIE, vol. 11515, 2020, pp. 517-524.

[2] Y. Zhang, **Y. Wang**, J. Dong, L. Qi, H. Fan, X. Dong, M. Jian, and H. Yu, "A joint guidance-enhanced perceptual encoder and atrous separable pyramid-convolutions for image inpainting", *Neurocomputing*, vol. 396, pp. 1-12, 2020.

[3] Y. Ju, M. Jian, S. Guo, **Y. Wang**, H. Zhou, and J. Dong, "Incorporating lambertian priors into surface normals measurement", *IEEE Transactions on Instrumentation and Measurement*, vol. 70, pp. 1-13, 2021.

[4] Y. Ju, X. Dong, **Y. Wang**, L. Qi, and J. Dong, "A dual-cue network for multispectral photometric stereo", *Pattern Recognition*, vol. 100, p. 107162, 2020.

Released Code

- Occupancy-SLAM: https://github.com/WANGYINGYU/Occupancy-SLAM

Patent

1. Junyu Dong, Jie Gao, Hao Fan, Jun Chi, **Yingyu Wang**, 3D Imaging Device and Method based on Multi-spectral Photometric Stereo and Laser Scanning, *Invention Patent in China.*

Projects

- Novel Non-feature Based SLAM: Joint Optimization of Non-feature Maps and Robot Trajectories

  (Ph.D. Thesis at University of Technology Sydney)

  A novel approach for jointly optimizing robot trajectories and non-feature maps (occupancy grid maps and signed distance function maps) to obtain more accurate estimates of both poses and the environment. The project consists of two main components: joint optimization of poses and non-feature maps and novel submap joining. Until now, there are 3 papers published or (conditionally) accepted related to this project. The implementation is carried out in C++ and MATLAB.

- High-Fidelity 3D LiDAR Mapping for Autonomous Driving

  (Cooperated with Robust Autonomy and Decisions Group at The University of Edinburgh)

  This project focuses on generating high-fidelity 3D point clouds for autonomous driving scenarios using LiDAR sensing. It also aims to enable robust and accurate localization in environments where GPS/GNSS signals are unreliable or unavailable, such as tunnels, bridges, and overpasses.

Professional Service

- Reviewer for Journal:
  The International Journal of Robotics Research (IJRR)
  IEEE Transactions on Robotics (T-RO)
- Reviewer for Conference:
  Robotics: Science and Systems (RSS) in 2025
  IEEE International Conference on Robotics and Automation (ICRA) in 2024 and 2025
  IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) in 2023 - 2025
- Other Service:
  Assisted Prof. Shoudong Huang (Publication chair in RSS'2023 and Registration chair in RSS'2024) in organizing RSS
  Organized our lab's *State Estimation* reading group in 2023
  Supported the organization of the IEEE RAS Winter School on SLAM in Deformable Environments, 2021