RONGLING ZHANG

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EDUCATION

Wuhan University Aug 2022 - Jun 2025
School of Geodesy and Geomatics *Wuhan, China*
Master of Photogrammetry and Remote Sensing (Advisor: Prof. Li Yan)

Harbin Institute of Technology Sep 2018 - Jun 2022
School of Electronics and Information Engineering *Harbin, China*
Bachelor of Remote Sensing Science and Technology

RESEARCH INTERESTS

Computer vision, 3D reconstruction, computer graphics, and point cloud data processing

SCIENTIFIC COMPETITIONS

The RoboMaster University Championship (RMUC) 2020 Jun 2019 – Aug 2020
Robotics Vision Engineer | Main Participant *Harbin, China*

- Researched precise and rapid activation of the Power Rune to support the whole team in the match, eventually achieving successful activation within 5 seconds.
  - Extracted ROI regions based on target contours and arrangement features to detect objects, achieving real-time RGB image processing.
  - Developed motion models and prediction schemes based on uniform and trigonometric periodic rotational speeds. Utilized Kalman filtering to smooth angles, achieving precise and continuous pitch and yaw estimation of targets within the robot's coordinate system.

RESEARCH EXPERIENCE

Efficient Coarse-to-Fine Registration Based on Micro-Structures Graph Jan 2023 – Feb 2024
Principal Investigator *Wuhan, China*

- Proposed a micro-structures graph-based, coarse-to fine global point cloud registration method that thoroughly exploits the information within graphs containing micro-structures for efficient outlier removal, robust coarse registration, and fast fine registration, which balances precision and efficiency well.
- Derived an enhanced GNC-Welsch estimator optimized from a robust estimation to the outlier process approach executed within the Lie algebra space. The estimator reduces sensitivity to outliers and initial values and converges towards heightened precision.
- Proposed PA-AA joint optimization to refine the micro-structures alignment, making our fine registration highly efficient and achieving higher accuracy.

Rapid Inspection Equipment Development Project for Dike Hazard Detection May 2023 – Nov 2023
Software and Algorithm Engineer | Main Participant *Wuhan, China*
Collaborating Institution: National Institute of Natural Hazards

- Conducted dike inspections using drones equipped with visible light cameras, LiDAR, and thermal infrared cameras to detect seepage.
  - Aligned and enhanced the quality of visible light images, thermal infrared images, and LiDAR point clouds through multi-source data processing.
  - Implemented a multi-level approach to detect and filter suspicious hazardous areas, facilitating the rapid localization of potential danger zones.

Data Processing and Capacity Measurement for Complex Cabin Spaces Aug 2022 – Dec 2022

Algorithm Engineer | Main Participant *Wuhan, China*

Collaborating Institution: Shanghai Merchant Ship Design & Research Institute

- Utilized multi-source integrated discrete point data of cabins to rapidly and accurately reconstruct 3D models of ship cabins.
  - Studied clustering segmentation and extraction techniques for structural features such as contours and boundaries in point cloud data. Achieved intelligent target classification and recognition through prior constraints.
  - Researched reconstructing scattered point cloud data models by combining point cloud segmentation based on region growing with surface fitting, achieving high-precision 3D reconstruction.

WORK EXPERIENCE

Assistant to the Counselor Mar 2023 – Jan 2024

- Assisted the counselor in handling graduate affairs in the school.

Editorial Board Member of *Luojia Youth Talk* Jun 2023 – Jan 2024

- Wrote the preface and proofread the text.
- Reached out to alumni for submissions.

Teaching Assistant for Digital Image Processing Course Sep 2022 – Jan 2023

- Course management.
- Assisted with laboratory sessions.

PUBLICATIONS

▷ **R. Zhang**, L. Yan, P. Wei, H. Xie, P. Wang and B. Wang, "Micro-Structures Graph-Based Point Cloud Registration for Balancing Efficiency and Accuracy," in IEEE Transactions on Geoscience and Remote Sensing, doi: 10.1109/TGRS.2024.3488502. ***(SCI Q1, accepted)***

AWARDS

▷ First Prize at the 19th National Robot Competition for College Students

▷ Outstanding Student Award

▷ National Scholarship

TECHNICAL SKILLS

▷ **Languages** : Chinese (native speaker), English (CET-6, academic writing and reading)

▷ **Programming**: C++, Matlab, Linux, Origin etc