Xuhui ZHAO

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WUHAN UNIVERSITY

Brief Introduction

✓ I'm a Ph.D. candidate at the School of Remote Sensing and Information Engineering, Wuhan University, specializing in **photogrammetry, remote sensing, and robotics**, will graduate in **Dec. 2024**.

✓ My research direction involves unmanned system-based **visual perception and localization** (Visual SLAM), satellite video **intelligent interpretation**, and **low-rank representation** and analysis.

Education Experience

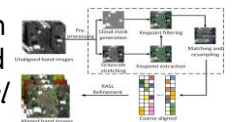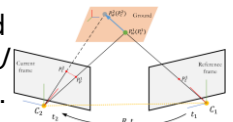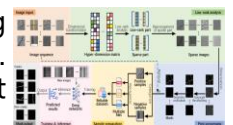|			
Wuhan University	School of Remote Sensing and Information Engineering, Department of Informatics	Ph.D.	Sep., 2020 - Now
Wuhan University	State Key Laboratory of Information Engineering in Surveying, Mapping, and Remote Sensing (LIESMARS)	Master	Sep., 2016 - Jul., 2019
Henan Polytechnic University	School of Surveying, Mapping, and Land Information Engineering	Bachelor	Sep., 2012 - Jul., 2016

Internship Experience

Pengcheng Laboratory	Intelligent Synergy Academician's Studio	Algorithm Intern	Dec., 2020 -Feb., 2021
Wuhan University	School of Remote Sensing and Information Engineering, Department of Informatics	Research Assistant	Sep., 2019 -Sep., 2020

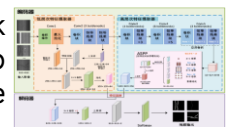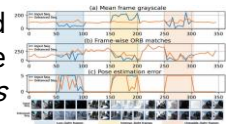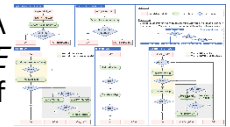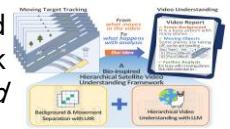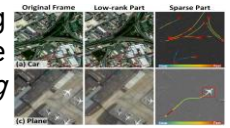## Publications

⭐ I have published over fifteen academic papers as the first author in top SCI journals and conferences in related fields, selected 10 papers are as follows:

1. Zhi Gao, **Xuhui Zhao**, Min Cao, Ziyao Li, Kangcheng Liu, and Ben M. Chen. Synergizing Low Rank Representation and Deep Learning for Automatic Pavement Crack Detection. *IEEE Transactions on Intelligent Transportation Systems,* 2023. (Supervisor as first author, Top Journal, IF: 9.55).

2. **Xuhui Zhao**, Zhi Gao, Hao Li, Hong Ji, Hong Yang, Chenyang Li, Hao Fang, and Ben M. Chen. How Challenging is a Challenge? CEMS: A Challenge Evaluation Module for SLAM Visual Perception. *Journal of Intelligent & Robotic Systems*, 2024. (IF: 3.4)

3. **Xuhui Zhao**, Zhi Gao, Yongjun Zhang, and Ben M. Chen. A Target Tracking and Positioning Framework for Video Satellites Based on SLAM. *2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Las Vegas, USA. (One of the top conferences in the robotics field).

4. **Xuhui Zhao**, Zhi Gao, Wenbo Sun, and Fei Wen. A Coarse-to-Fine Band Registration Framework for Multi/Hyperspectral Remote Sensing Images Considering Cloud Influence. *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 2020. (Top conferences in the remote sensing field).

5. **Xuhui Zhao**, Ziqian Huang, Anqi Zhao, Ziyao Li, and Zhi Gao. A General Target Tracking and Sample Generation Framework for Satellite Videos Leveraging on Geometry-Aware Low-Rank Representation. *2023 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, Pasadena, USA. (Top conferences in the remote sensing field).

6. **Xuhui Zhao**, Zhenghao Liao, Yue Huang, Siqi Liu, and Zhi Gao. A Bio-inspired Hierarchical Understanding Framework for Satellite Video Leveraging Low-Rank Representation and Large Language Model. *2024 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, Athens, Greece.

7. **Xuhui Zhao**, Zhi Gao, Jialiang Wang, Zhipeng Lin, Zhiyu Zhou, and Yue Huang. A Robust and Efficient Visual-Inertial SLAM for Vision-Degraded Environments. *2024 IEEE International Conference on Control & Automation (ICCA)*, Reykjavík, Iceland. (One of the famous conferences in robotics & control field).

8. **Xuhui Zhao**, Zhaohong Liao, Xin Wu, Chenyang Li, Jingwei Chen, and Zhi Gao. Toward the Resilient SLAM in Adverse Illumination Environments with Learning-based Image Transformation. *2022 IEEE International Conference on Robotics and Biomimetics (ROBIO)*, Jinghong, China. (One of the famous conferences in robotics field).

9. **Xuhui Zhao**, Anqi Zhao, Zhenghao Liao, Ziqian Huang, and Zhi Gao. A Computationally Efficient Visual SLAM for Low-light and Low-texture Environments Based on Neural Networks. *2023 IEEE International Conference on Real-time Computing and Robotics (RCAR)*, Datong, China. (One of the famous conferences in robotics field).

10. **Xuhui Zhao**, Mengjie Xie, Biao Yang, Gang Yang, and Zhi Gao. A Method for Crack Detection and Sample Generation Based on Low Rank Representation and Deep Learning. *Acta Geodaetica et Cartographica Sinica*. 2023. (Top journal in remote sensing field in China, EI and Scopus indexed).

Patents

1. A Framework for Intelligent Interpretation and Analysis of Satellite Video by Synergizing Low Rank Representation and Large Language Models (In Chinese) — Rank: 2/8 (First Student)
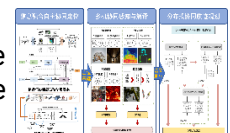
Projects

⭐ I am dedicatedly involved in over ten high-level academic projects as a key member (ranked first student), selected 5 projects are as follows:

1. **Major Program of NSFC (National Natural Science Foundation of China): Remote Sensing on-orbit Real-time Diagnosis for the Earth's Surface Anomalies** — Jan., 2022
Duty: Full participation as the core student member, responsible for Earth's surface anomaly detection framework design, initial implementation, optimization in embedded platforms, and the production of documents and slides.

2. **Outstanding Youth Project of Hubei Province: Research on Localization and Perception of Multi-agent Collaboration in Complex Environments** — Oct., 2021
Duty: Full participation as the core student member, responsible for the literature review, overall framework design, multi-sensor fusion in challenging scenes, single agent robust visual perception, and the production of documents and slides.

3. **Special Fund of Hubei Lujia Laboratory: Research on Collaborative Localization and Perception with Distributed Multi Agents** — Feb., 2022
Duty: Full participation as the core student member, responsible for design of the multi-source based perception framework toward challenging scenes, prototype system development and testing, and the production of documents and slides.

4. **Open Fund of WHU-Huawei Joint Labortory: Research on Data Fusion SLAM based on Distributed and Lightweight LVI (LiDAR-Vision-Inertial) Sensor** — Dec., 2021
Duty: Full participation as the core student member, responsible for the design of the robust visual-inertial-LiDAR perception, system deployment and optimization on embedded platforms, and the production of documents and slides.
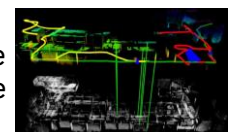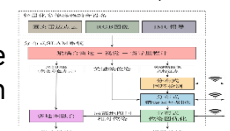
5. **WHU-Zhizhuo Research Fund: Visual Localization and Scene Understanding in Adverse Weather Conditions**   Mar., 2022

   Duty: Full participation as the core student member, responsible for the design and development of the visual enhancement module for bad weather, the robust SLAM against adverse conditions, and the production of documents and slides.

Academic Activities

⭐ I have attended and orally presented over twenty academic conferences and activities, selected 15 conferences are as follows:

1.	**Dec., 2020**	Wuhan, China	International Graduate Workshop on GeoInformatics Round Table Forum	Invited Speech
2.	**Nov., 2021**	Wuhan, China	Inter-disciplinary Graduate Academic Forum on Information Science and Technology in Central China Universities	Invited Speech
3.	**Nov., 2021**	Wuhan, China	Zhizhuo Doctoral Forum, Photogrammetry and Computer Vision Workshop	Invited Speech
4.	**Oct., 2020**	Las Vegas, USA	IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)	Oral Pre.
5.	**Jul., 2024**	Athens, Greece	IEEE International Geoscience and Remote Sensing Symposium (IGARSS)	Oral Pre.
6.	**Jul., 2023**	Pasadena, USA	IEEE International Geoscience and Remote Sensing Symposium (IGARSS)	Oral Pre.
7.	**Jun., 2024**	Reykjavík, Iceland	IEEE International Conference on Control & Automation (ICCA)	Oral Pre.
8.	**Dec., 2022**	Jinghong, China	IEEE International Conference on Robotics and Biomimetics (ROBIO)	Oral Pre.
9.	**Jul., 2023**	Datong, China	IEEE International Conference on Real-time Computing and Robotics (RCAR)	Oral Pre.
10.	**Aug., 2023**	Kuala Lumpur, Malaysia	International Conference on Brain-Inspired Cognitive Systems (BICS)	Oral Pre.
11.	**Dec., 2023**	Wuhan, China	International Graduate Workshop on GeoInformatics	Oral Pre.
12.	**Nov., 2019**	Shenzhen, China	Youth Scholar Forum on Artificial Intelligence and Intelligent Transportation	Oral Pre.
13.	**Dec., 2020**	Wuhan, China	International Graduate Workshop on GeoInformatics	Oral Pre.
14.	**Jun., 2022**	Nice, France	XXIV ISPRS Congress	Poster Pre.
15.	**Oct., 2023**	Wuhan, China	International Symposium on Advanced Remote Sensing	Poster Pre.

Academic Services

⭐ I participated in various academic work and contribute to related fields, selected jobs are as follows:

1. Session Chair for *Session: Perception and Localization* in Pre-IROS Conference   **Oct., 2020**
2. Session Chair for *Session: Innovative Models for Static and Moving Objects* in IGARSS   **Jul., 2023**
3. Reviewer for International Workshop on Engineering Physics (IWEP) Conference   **May, 2023**
4. Reviewer for IEEE Transactions on Industrial Informatics (T-TII)   **Aug., 2023**
5. Technical Program Committee Member of 2024 International Conference on Information Society and Smart City (ISSC)   **Sep., 2023**
6. Technical Program Committee Member of 2024 International Conference on Geoscience, Remote Sensing and Optics Technology (GRSOT)   **Oct., 2023**

Honors & Certificates

⭐ I have received more than ten related awards, selected 10 awards are as follows:

1.	China Invention Association Invention, Entrepreneurship and Innovation Award	Second Award	**Oct., 2022**
2.	BICS, Best Student Paper	Academic Award	**Aug., 2023**
3.	Wuhan University, Outstanding Graduate Student	Honorary Title	**Oct., 2023**
4.	Wuhan University, Academic Innovation Award	Scholarship	**Nov., 2023**
5.	Wuhan University, Wang Zhizhuo Innovation Talent Award	Scholarship	**Dec., 2023**
6.	Wuhan University, Excellent Academic Scholarship	Scholarship	**Dec., 2021**
7.	Wuhan University, Special Scholarship for the Graduate Student Abroad Exchange Program	Scholarship	**Jun., 2023**
8.	International GeoInformatics Summer School	Excellent Participant Award	**Aug., 2020**
9.	Solicitation LOGO of Graduate Student Union in School	Best Design Award	**Apr., 2022**
10.	Wuhan University, Social Activist	Honorary Title	**Jun., 2021**

Social Services

⭐ I actively undertake many social work for the school, selected work are as follows:

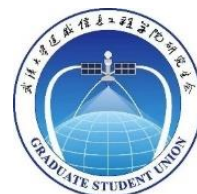|		
1.	Head of the New-Media Department in *GeoScience Café* Society	**Sep., 2020**
2.	Head of the Publicity Department in *English GeoScience Café* Society	**Sep., 2020**
3.	Chair of the Doctoral Chapter of the Graduate Union in School	**Sep., 2021**
4.	Representative for Graduate Congress (11th and 12th) in School	**Jun., 2022, May, 2023**
5.	Lecturer of Joint Training Course in Wuhan University (Poster Production Topic)	**Nov., 2022**

Community Contributions

1. My GitHub account ([@zhaoxuhui](#)) has accumulated 250+ Followers, 390+ Stars, 100+ Forks, until Oct. 14, 2024.

2. I have established a technical blog (https://zhaoxuhui.top) since 2017 and until Jun. 12, 2024:
   - Published 352 blog articles with a cumulative word count of 2.27 million+ words (Source: Jekyll)
   - Accumulated 1.6 million+ visits from 170+ countries/regions in the world (Source: Google Analysis)
   - Many original contents rank among TOP-3 in Google, such as Chinese keywords: "numba 教程", "灰度共生矩阵", "相机畸变", "相机位姿估计", "图像信息熵" (Source: Google Search Console)
   - Some notes and tutorials have been widely reprinted, quoted, and praised. (Source: Livere.com)
   - Users usually visit a single page for 14 minutes, and 1.79 pages each time. (Source: Microsoft Clarity)

3. I hosted and designed the of the Student Union LOGOs of my corresponding schools during my undergraduate, master and Ph.D stages, as follows.

Henan Polytechnic University	**Wuhan University**	**Wuhan University**
Student Union LOGO of the School of Surveying and Land Information Engineering	Graduate Union LOGO of the State Key Laboratory of Information Engineering in Surveying, Mapping, and Remote Sensing	Graduate Union LOGO of the School of Remote Sensing and Information Engineering
(2014-Now)	(2017-Now)	(2022-Now)

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