CURRICULUM VITAE

Professor Lizhe Wang

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Full Professor
IEEE Fellow, "for contributions to high performance computing in processing, analysis and applications of remote sensing imagery."
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Bio and interests. Prof. Lizhe Wang was born in Liaoning, China, in Dec. 1974. He received his B.E. and M.E. degree from Tsinghua University, the best University of China, both in Electrical Engineering in 1998 and 2001 respectively. He received his D.E. degree in Applied Informatics from University Karlsruhe, a top elite University in Germany, in 2008. He was a research scientist & deputy director at Rochester Institute of Technology (2009) and a research scientist & Principal Software Engineer at Indiana University (2010-2011). He served as a professor in Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, 2012-2015. He became a full professor with Computer Science, China University of Geosciences since 2015.
He has authored or co-authored more than 200+ peer-reviewed journal papers, 100+ conference papers and 7 books in English and 10 books in Chinese. His citation record is as follows: **23443** citations, h-index: **73**, i10-index: **301** (as of Oct. 2024 according to Google Scholar).

His main research interests comprise remotely sensed image analysis (including hyperspectral and radar data), signal processing, remote sensing applications. He is currently one of the top cited authors in the area of remotely sensed image processing, with a current total of 17 papers distinguished as "Highly Cited Papers" in Clarivate Analytics' Web of Science Essential Science Indicators (WoS-ESI). He has been selected as a cited scholar of Clarivate and Elsevier and selected in the Top 2% of the world's top scientists released by the Stanford University.

Distinctions and awards. Prof. Wang is a Member of Academia Europaea, Fellow of IEEE (Institute of Electrical and Electronics Engineers), SPIE (International Society for Optical Engineering), of IET (The Institution of Engineering and Technology), and BCS (British Computer Society), AAIA (Asia-Pacific Artificial Intelligence Association). He received the prestigious IEEE GRSS Region Leadership Award in 2022 "for contributions to promoting the regional research development in remote sensing big data computing algorithms and applications." He received the Prize paper award of IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (J-STARS) in 2021. He received IEEE TCSC Award of Excellence for Middle Career Researcher in 2017. He has received 20+ National and Provincial research awards in China.

Editorial activities. Prof. Wang currently is serving as an Associated Editor of IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (J-STARS), IEEE Journal of Miniaturized Air and Space Systems (J-MASS), International Journal of Digital Earth (IJDE), Remote Sensing, Big Earth Data Journal. He served as a guest editor of IEEE TGRS, J-STARS, and GRSL.

Involvement in technical societies. Prof. Wang is the promoter of the IEEE GRSS Wuhan Chapter (2022-). He was in charge of organizing the GRSS Wuhan Chapter Summer Schools (since 2022). He has been a Keynote Speaker in 50+ conferences/symposium/workshops.

Participation in committees of international conferences and symposia. Prof. Wang has been the General Chair for 50+ conferences/symposium/workshops, e.g., International Conference on Geoscience Big Data, 2017-2021; International Workshop on IoT based Big Data Architectures and Applications, 2020; 14th International Conference on Digital Image Processing, 2022, 2015 SPIE conference HPC in remote sensing, 2015.
He was a program committee member for 100+ conferences/symposium/workshops, e.g., International Forum on Big Data for Sustainable Development Goals, 2021-2024; the 35th International Symposium on Remote Sensing of Environment, 2017; "Big Spatial Earth Data" Science and Technology Frontier Forum, Chinese Academy of Science, 2015.

Proposal evaluation and reviewing activities. Prof. Wang has served as a proposal evaluator for the Chinese National Science Foundation, the Chinese Scholarship Council, and Austria. He has participated in the Tenure Track Selection Committee of different Universities in China, Australia and U.S.

Selected Lectures

1. Title: Remote Sensing Information Processing for Sustainable Development Goals in Urban Environments

Abstract: As global urbanization accelerates, cities face numerous challenges including population growth, resource scarcity, infrastructure inequality, and environmental degradation. Sustainable Development Goal 11 (SDG 11) aims to build inclusive, safe, resilient, and sustainable cities. Achieving this goal relies heavily on accurate and dynamic urban monitoring techniques, where remote sensing technology plays a pivotal role. Remote sensing has been extensively employed in urban environmental monitoring, land use planning, infrastructure assessment, and disaster management. Recent advancements in remote sensing technology, such as high-resolution satellite and drone imagery, coupled with innovative methods, have significantly broadened its application potential in supporting urban sustainable development.

This lecture focuses on Remote Sensing Information Processing for Supporting Urban Sustainable Development Goals (RS4USDG). It begins with an introduction to SDG's concepts and developmental roadmap, particularly SDG 11, and RS4USDG. It subsequently provides a systematic overview of remote sensing imaging platforms, highlighting their advantages including extensive coverage, high spatial and temporal resolutions, and multi-spectral data collection capabilities. Advanced remote sensing methods such as machine learning, deep learning, and remote sensing foundation models are further discussed, emphasizing their importance and role in advancing SDG 11. The methodologies and framework of RS4USDG are then outlined. Furthermore, the lecture examines recent advancements in RS4USDG and their applications to specific SDG 11 targets (e.g., SDG 11.1, SDG 11.7), illustrated through case studies on urban informal settlements, open spaces, and functional zones. Finally, potential research opportunities and future outcomes are explored.

2. Title: Remote Sensing Image Intelligence Processing for Geological Applications

Abstract: Advanced artificial intelligence (AI) technologies have accelerated a paradigm shift in Earth science research, revealing unprecedented potential for driving the development of geosciences and offering new solutions to the complex challenges of intelligent interpretation in geological remote sensing. The large-scale exploitation of mineral, land, underground, and water resources by humans has triggered a range of geological environmental problems, including geological disasters, mining pollution, soil erosion, and ecological degradation. Processing geological remote sensing data is crucial for addressing these challenges. This lecture will focus on the critical role AI plays in interpreting key geological elements such as rock formations, soil, water bodies, geological hazards, mines, and soil erosion.
Traditional end-to-end intelligent algorithms, which rely solely on remote sensing image features, face challenges such as poor interpretability and low accuracy due to the adversarial nature of the surface environment and the fragmented nature of image patches. Supplementing remote sensing data with geological surveys and designing efficient, reliable deep learning frameworks embedded with prior geoscientific knowledge represents the forefront of geological remote sensing research.
This lecture will introduce advanced methods and outcomes in intelligent geological remote sensing interpretation, including multi-level sensitive feature extraction and enhancement, and expert knowledge and multi-source data-driven interpretation of rock and soil elements,

long-term intelligent interpretation of water bodies that accounts for seasonal variations, the "data-knowledge-model" joint optimization approach for intelligent mining area remote sensing interpretation, interpretable AI for identifying geological hazard risks, and the improved RUSLE model for soil erosion analysis. Using Hubei Province, China, as a research area, we will summarize the latest technologies, research achievements, and theoretical trends in the field of geological environment remote sensing interpretation.

Recent publications 2014-2024

Books:

1. Chen, W., Li, X., Qin, X., & Wang, L. (2024). Remote Sensing Intelligent Interpretation for Geology. Springer Nature.
2. Chen, W., Zhong, C., Qin, X., & Wang, L. (2023). Intelligent Interpretation for Geological Disasters: From Space-air-ground Integration Perspective. Springer Nature.
3. Chen, W., Li, X., & Wang, L. (2022). Remote Sensing Intelligent Interpretation for Mine Geological Environment: From Land Use and Land Cover Perspective. Springer Nature.
4. Ranjan, R., Mitra, K., Jayaraman, P. P., Wang, L., & Zomaya, A. Y. (Eds.). (2020). Handbook of integration of cloud computing, cyber physical systems and Internet of Things (Vol. 331). Springer.
5. Mu, L., Wang, L., & Yan, J. (2019). Information Engineering of Emergency Treatment for Marine Oil Spill Accidents. CRC Press.
6. Wang L, Yan J, Ma Y. Cloud computing in remote sensing. Chapman and Hall/CRC, 2019.
7. Hameurlain, A., Küng, J., Wagner, R., Liddle, S. W., Schewe, K. D., & Zhou, X. (Eds.). (2012). Transactions on Large-Scale Data-and Knowledge-Centered Systems VI: Special Issue on Database-and Expert-Systems Applications (Vol. 7600). Springer.

Journal papers:

1. Ma, H., Yang, X., Fan, R., Han, W., He, K., & Wang, L. (2024). Refined Water-Body Types Mapping Using a Water-Scene Enhancement Deep Models by Fusing Optical and SAR Images. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing. September 2024. [IF(2024)=4.7].
2. He, H., Yan, J., Liang, D., Sun, Z., Li, J., & Wang, L. (2024). Time-series land cover change detection using deep learning-based temporal semantic segmentation. Remote Sensing of Environment, 305, 114101. May 2024. [IF(2024)=11.1].
3. Wu, L., Chen, Y., Le, Y., Qian, Y., Zhang, D., & Wang, L. (2024). A high-precision fusion bathymetry of multi-channel waveform curvature for bathymetric LiDAR systems. International Journal of Applied Earth Observation and Geoinformation, 128, 103770. March 2024. [IF(2024)=7.6].
4. Wang, S., Han, W., Huang, X., Zhang, X., Wang, L., & Li, J. (2024). Trustworthy remote sensing interpretation: Concepts, technologies, and applications. ISPRS Journal of Photogrammetry and Remote Sensing, 209, 150-172. March 2024. [IF(2024)=10.6].
5. Liang, Y., Shi, G., Cai, R., Yuan, Y., Xie, Z., Yu, L., Wang, L., & Tang, Z. (2024). PROST: quantitative identification of spatially variable genes and domain detection in spatial transcriptomics. Nature Communications, 15(1), 600. January 2024. [IF(2024)=14.3].
6. Liu, P., Wang, L., Chen, J., & Cui, Y. (2024). Semi-blind Compressed Sensing: a Quantitatively Descriptive Framework for Spatiotemporal Fusion of Remote Sensing Images.