Dr. WAN Luoma

Honorary Lecturer
The University of Hong Kong
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Education

2018 – 2021 Ph.D. in Earth System and Geoinformation Science, The Chinese University of Hong Kong
2012 – 2015 M. Eng. in Software Engineering, South China Normal University
2008 – 2012 B.Sc. in Computer Science and Technology, Wuhan Institute of Technology

Position Held

2025.1 - Honorary lecturer
2021.8 – 2024.12 Postdoctoral fellow, The Hong Kong Polytechnic University
2015 – 2018 Research Assistant, Institute of Space and Earth Information Science, CUHK

Research Interests

- Remote Sensing Image Processing; Deep Learning; Mangroves; Carbon Cycle

Dissertation

- Monitoring the Mangrove Species in Hong Kong with High Resolution Images Using Deep Learning Networks

Research work & projects

- A people-centric index for livability assessment of urban communities, Smart Cities Research Institute (SCRI) Research Project Proposal for Joint Research Fund (JRF), 2022-2025, **Co-I**
- Research on three-dimensional monitoring marine and environment for Guangdong coastline and sea island (面向广东海岸线和海域海岛的海洋及环境数据立体感知与监测共享方法研究), Guangdong Basic and Applied Basic Research Foundation, 2022-2026, **Major research member**
- Developing Low-Cost Remote Sensing System for Detecting Illegal Dumping of Construction Waste in Hong Kong, Public Policy Research Funding Scheme (PPR), 2022-2023, **Co-I**
- Fusion of optical and synthetic aperture radar remote sensing to improve urban impervious surface extraction (NSFC), 2021-2024, **Co-I**.
- Joint Field Surveys of mangrove forests in Hong Kong, Guangdong, and Hainan, 2016-2019, ***Participant and Organizer***.
- Mangrove Species Discrimination in Hong Kong with Synergistic Use of High Resolution Optical and SAR Satellite Data, General Research Fund (GRF), 2017-2019, ***Participant***
- Improving Mangrove Species Discrimination with Sophisticated Texture Information using Very High-Resolution Optical Satellite Imagery, CUHK Direct Grant, 2016-2017, ***Participant***
- Research on Intelligent Processing of Multi-Scales Remote Sensing Image and Human Visual Cognition (NSFC), 2013–2015, ***Participant***
- Spatial Information Integration, Service and Applications for Mobile Internet with SVG, Science and Technology Innovation Project of Guangdong, 2012–2013, ***Participant***
- Land use Website Updating using SVG (Scale Vector Graphic), 2013.03 - 2013.10, ***Participant***
- System development of Wireless Temperature Monitoring (Wuhan E-Relay Electric Co., Ltd), 2012.07 - 2012.09

Selected Publications

[1] Q Liu, **Luoma Wan**, F Xu, R Gou, G Lin, X Zhu. Historical spatiotemporal trends in global mangrove productivity and its response to the environment: Perspectives from multiple satellite-based productivity proxies. ***Agric. For. Meteorol.,*** 2025.

[2] Q Su, X Zhu, **Luoma Wan**, S Zhao, D Liu, L Peng, X Chen. CutMix-CD: Advancing Semi-Supervised Change Detection via Mixed Sample Consistency. ***IEEE Trans. Geosci. Remote Sens***., 2025.

[3] L Peng, T Wei, X Chen, X Chen, R Sun, **Luoma Wan**, J Chen, X Zhu. Human-annotated label noise and their impact on ConvNets for remote sensing image scene classification. ***IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens.***, 2024.

[4] S Xu, X Zhu, J Chen, X Zhu, M Duan, B Qiu, **Luoma Wan**, X Tan, Y Xu, R Cao. A robust index to extract paddy fields in cloudy regions from SAR time series. ***Remote Sens. Environ***., 2023.

[5] Y Meng, R Gou, J Bai, D Moreno-Mateos, C Davis, **Luoma Wan**, S Song, H Zhang, X Zhu, G Lin. Spatial patterns and driving factors of carbon stocks in mangrove forests on Hainan Island, China. ***Glob. Ecol. Biogeogr***., 2022.

[6] Y Guo**, Luoma Wan**, H Zhang*, Y Lin and H Wang. A seasonal resilience index to evaluate the impacts of super typhoons on urban vegetation in Hong Kong. ***Ann. Am. Assoc. Geogr.***, 2022.

[7] Y Lin, **Luoma Wan**, H Zhang*, S Wei, P Ma, Y Li, Z Zhao. Leveraging optical and SAR data with a UU-Net for large scale road extraction. ***Int. J. Appl. Earth Obs. Geoinf.***, 2021.

[8] J Tian, X Zhu*, **Luoma Wan**, M Collin. Impacts of Satellite Revisit Frequency on Spring Phenology Monitoring of Deciduous Broad-leaved Forests based on Vegetation Index Time Series. ***IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens.***, 2021.

[9] S Wei, Y Lin, **Luoma Wan**, G Lin, Y Zhang, H Zhang*. Developing a grid-based association rules mining approach to quantify the impacts of urbanization on the spatial extent of mangroves in China. ***Int. J. Appl. Earth Obs. Geoinf.***, 2021.

[10] H Zhang*, Y Lin, S Wei, P Loo, P Lai, Y Lam, **Luoma Wan**, Y Li. Global association between satellite-derived nitrogen dioxide (NO2) and lockdown policies under the COVID-19 pandemic. ***Sci. Total Environ.***, 2021.

[11] S Wei, Y Lin, H Zhang*, **Luoma Wan**, H Lin, and Z Wu. Estimating Chinese residential populations from analysis of impervious surfaces derived from satellite images. ***Int. J. Remote Sens.***, 2021.

[12] **Luoma Wan**, H Zhang, M Liu, Y Lin, H Lin. Early Monitoring Exotic Mangrove Sonneratia in Hong Kong Using Deep Convolutional Network at Half Meter Resolution. ***IEEE Geosci. Remote Sens. Lett.,*** 2020.

[13] **Luoma Wan**, Y Lin, H Zhang*, F Wang, M Liu, H Lin. GF-5 Hyperspectral Data for Species Mapping of Mangrove in Mai Po, Hong Kong. ***Remote Sens.,*** 2020.

[14] H Zhang, **Luoma Wan***, T Wang, Y Lin, H Lin, Z Zheng. Impervious surface estimation from optical and polarimetric SAR data using small-patched deep convolutional networks: a comparative study. ***IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens.,*** 2019.

[15] Y Lin, H Zhang*, G Li, T Wang, **Luoma Wan**, and H Lin. Improving Impervious Surface Extraction with Shadow-based Sparse Representation from Optical, SAR and LiDAR Data***. IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens.,*** 2019.

[16] **Luoma Wan**, H Zhang*, G Lin, H Lin. A small-patched convolutional neural network for mangrove mapping at species level using high resolution remote sensing image. ***Ann. GIS***, 2018.

[17] H Zhang*, Y Lin, T Wang, **Luoma Wan**, Y Li, H Lin, Y Zhang. Fusing optical and SAR remote sensing data for urban impervious surface estimation. ***Geogr. Inf. Sci.***, 2018.

[18] **Luoma Wan**, H Zhang*, T Wang, G Li, and H Lin. Mangrove species discrimination from very high-resolution imagery using Gaussian Markov Random Field model. ***Wetlands,*** 2018.

[19] **Luoma Wan**, H Zhang, P Ma, G Lin. Mangrove species mapping using deep learning with fusion of hyperspectral and high-resolution multispectral images. ***Int. Geosci. Remote Sens. Symp.,*** 2021. (oral)

[20] H Zhang, **Luoma Wan**, T Wang, H Lin. Combining optical and SAR data for urban impervious surface estimation using a deep convolutional network: *AlexNet*. ***Int. Geosci. Remote Sens. Symp.,*** 2018.

Awards

2021	The third prize, the 1st Journal of Remote Sensing Youth Academic Forum, 2021
2021	The Most Cited Paper, 'A small-patched convolutional neural network for mangrove mapping at species level using high-resolution remote-sensing image' in Annals of GIS
2018	Best Poster Award, ESA-MOST DRAGON 4 PROGRAMME
2018	Best Student Paper Award, the 26th International Conference on Geoinformatics
2012	Excellent graduation thesis (Provincial Level)
2011	The third prize scholarship (School Level)
2011/2010	National Level Awards in Smart Car Competition (Excellent prize in Freescale, Second prize in Renesas)

Services

Journal reviewer IEEE Trans. Geosci. Remote Sens. (TGRS), Int. J. Appl. Earth Obs. Geoinf. (JAG), IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens. (JSTARS), Annals of GIS, Remote Sensing, Geo-spatial Information Science, etc.

Teaching assistant Course of Environmental Remote Sensing Technology, 2017.09 – 2020.12
Course of Remote Sensing, 2023.01-2023.04

Skills

Programming Python, GEE, MATLAB, ENVI, ArcGIS, C/C++, Java, SQL.

Field work UAV, Quadrat surveys (HK & Mainland China), Driving licenses (HK & Mainland China), Diving Certificate.