Session title: Urbanization Monitoring with Big Earth Data

Session organizer: China University of Geosciences

Short Description

The process of urbanization is accompanied by the expansion of urban area, population growth and GDP increase. However, urbanization has also caused ecological and geological environmental effects such as air pollution, water pollution, urban heat island, land subsidence, and landslides. Big Earth data, such as remote sensing data, has played an important role in monitoring the dynamic changes of urban land use, human settlements, ecological environment, and geological environment due to its advantages of uninterrupted, objective, and all-round observation. In-depth mining and analysis of urban spatial big data is of great significance for understanding urban dynamics and their effects on ecology, human settlements, and geological environment, and making suggestions for urban planning and governance decisions.

Objectives

1) Advanced classification techniques of urban land use and land cover, including rule-based approaches, data-driven approaches, reinforcement learning approaches, and ensemble methods of rule-based, data-driven, and reinforced learning
2) Spatio-temporal dynamics of urban growth, including semi-supervised, unsupervised, supervised urban land cover/use time-series change detection, etc.
3) Urban geological environment monitoring, including the use of big earth data to carry out urban land subsidence monitoring, urban landslide monitoring, urban soil erosion risk assessment, urban debris flow risk early warning, etc.
4) Urban ecological environment monitoring, including the use of big earth data to carry out urban air pollution monitoring, water pollution monitoring, wetland degradation monitoring, heat island effect analysis, and urban carbon emission monitoring, etc.
5) Urban human settlement monitoring, including the use of big earth data to monitor population growth, GDP growth, and land use rate changes in the process of urbanization, etc.
6) State-of-the-art spatial data analysis technologies related to urbanization process monitoring

Expected results

This conference aims to bring together researchers, practitioners and stakeholders to share their experiences and discuss the latest progress, applications and challenges of Big Earth Data underpinning urbanization process monitoring.

Agenda

Time 13:30-15:00, September 7th 2023 Room: 305 C

Moderator:

WANG Lizhe

Professor

China University of Geosciences

Prof. Lizhe Wang is a full professor and the Vice-Chancellor of China University of Geosciences. He is an academician of Academia Europaea, IEEE Fellow, and SPIE Fellow. Now he serves on the editorial boards of scientific data, IEEE J-MASS, IEEE J-STARS, IJDE and other international journals. His research interests include digital earth theory, remote sensing information engineering, and application of geological information.

Participants

Event 1 (13:30-13:45)

Satellite monitoring of war urban damage with a temporal knowledge-guided deep learning scheme

ZHANG Liqiang

Professor

Beijing Normal University

The State Key Laboratory of Remote Sensing Sciences, Faculty of Geographical Science, Beijing Normal University, Beijing, China. Dr. Zhang received the Ph.D. degree from Institute of Remote Sensing Applications, Chinese Academy of Sciences, Beijing, China, July 2004. His main research interests include remote sensing imagery/point cloud parsing, spatial analysis and 3D modeling. My research work was published in the journals like IEEE TGRS and ISPRS Journal of Photogrammetry, and Remote Sensing.

Event 2 (13:45-14:00)

Development of atmospheric cloud properties and surface radiation remote sensing products: application in urban solar energy monitoring

Husi Letu

Professor

Aerospace Information Research Institute, CAS

Husi Letu (IEEE Senior Member) is currently a professor of the State Key Laboratory of Remote Sensing and Digital Earth, Aerospace Information Research Institute, Chinese Academy of Sciences (CAS). He is the Chairman and Originator of the Cloud Remote Sensing, Atmosphere Radiation and Renewal Energy (CARE) international symposium (http://www.slrss.cn/care/). He has published over 120 peer-reviewed papers in scientific journals like BAMS, Atmospheric Chemistry and Physics, Journal of Geophysical Research, etc. He has served as the Associate Editor of Journal of Atmospheric Science Letters and sits on the editorial boards of National Remote Sensing Bulletin and Chinese Journal of Space Science. He has received funding support from the National Natural Science Foundation of China's Distinguished Young Scholars. His research interests mainly include remote sensing theory and techniques, atmospheric radiative transfer simulation, light scattering calculation, cloud remote sensing and radiation energy balance.

Event 3 (14:00-14:15)

Study on the impact of urbanization process on vegetation: a case study of the Beijing-Tianjin-Hebei urban agglomeration

WANG Jia

Professor

Beijing Forestry University, China

Wang Jia, Professor, doctoral supervisor, Deputy Dean of College of Forestry, Beijing Forestry University, head of Geography and Information Science, head of national first-class undergraduate major construction site, Deputy director of Beijing Key Laboratory. Deputy Secretary-General of Precision Agriculture and Forestry Committee of China Geographic Information Industry Association, member of Education Committee, member of Employment Committee, director of Beijing Surveying and Mapping Society, and former director of Geography Remote

Sensing and Geographic Information System Direction Flow Project of the Department of Geography, National Natural Science Foundation of China.

He is mainly engaged in the application research of remote sensing and geographic information technology in forest resources and ecological environment. He has presided over and completed 4 projects of the National Natural Science Foundation, 2 projects of the Beijing Natural Science Foundation, 1 project of the doctoral program of the Ministry of Education and more than 30 projects of various kinds. Dr. Jia Wang has published more than 80 academic papers, including over 30 papers indexed in SCI and EI. He has received the First Prize and Third Prize for Technological Advancement from the Beijing Municipal Government, the Second Prize for Technical Invention from the State Forestry and Grassland Administration, and the Second Prize for Innovation in Invention from China.

Event 4 (14:15-14:30)

SinoLC-1: the first 1-meter resolution national-scale land-cover map of China created with the deep learning framework and open-access data

ZHANG Hongyan

Professor

China University of Geosciences, China

Prof. ZHANG Hongyan received the Ph.D. degree in photogrammetry and remote sensing from Wuhan University in 2010, and was appointed as Full Professor there in 2016. He is currently the dean of Computer School, China University of Geosciences. His research interests mainly focus on image reconstruction for quality improvement, hyperspectral information processing and agricultural remote sensing. Dr. Zhang has authored/co-authored 98 journal citation report (JCR) papers, inlcuding 3 ESI Hot Papers and 16 ESI Highly Cited Papers. Prof. Zhang is a Senior Member of IEEE, and has been recognized as the 2021 and 2022 Chinese Highly Cited Scholar by Elsevier. Meanwhile, he has served as the Associate Editor for IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, Computers & Geoscience and Photogrammetric Engineering & Remote Sensing.

Event 5 (14:30-14:45)

Scattering power decomposition for compact polarimetric SAR and application of urban terrain classification

GAO Gui

Professor

Southwest Jiaotong University, China

Gui Gao received his B.S., M.S., and Ph.D. degrees from the National University of Defense Technology (NUDT), Changsha, China, in 2002, 2003, and 2007, respectively. In 2007, he joined the Faculty of Information Engineering, School of Electronic Science and Engineering, NUDT, as an associate professor. In 2017, he joined the Faculty of Geosciences and Environmental Engineering, Southwest Jiaotong University, Chengdu, 611756, China, where he is currently a professor. He has authored more than 100 journal and conference papers and written eight books and an English chapter. He has received numerous awards, including the Excellent Master Thesis of Hunan Province in 2006, Excellent Doctor Thesis in 2008, and Outstanding Young People in NUDT and Hunan Province of China in 2014 and 2016 as well as a first-class Prize of Science and Technology Progress and a Natural Science in Hunan Province award. He was also selected as an Academic and technical leader in Sichuan Province, an Expert of Sichuan Provincial Thousand Talents Plan, a Young Talent of Hunan, a Lecture Professor of "Minjiang Scholars" in Fujian Province, and supported by the Excellent Young People Science Foundation of the National Natural Science Foundation of China. He is also the leaders of Sichuan Natural Science Foundation Innovation Group and the Innovation Team of the Ministry of Education of China. He is the lead guest editors of IEEE GRSM, JAP, IJAP, the guest editor of Remote Sensing, and an associate editor and the lead guest editor of IEEE JSTARS, and he is on the editorial board of Chinese Journal of Radars.

Event 6 (14:45-15:00)

Impacts of perceived safety and beauty of park environments on time spent in parks: examining the potential of street view imagery and phone-based GPS data

ZHOU Hanlin

PhD Candidate

University of Toronto, Canada

ZHOU Hanlin is a PhD Candidate in the Department of Geography and Planning, University of Toronto, ON M5S 3G3, Canada, and Department of Geography, Geomatics, and Environment, University of Toronto Mississauga,

ON L5L 1C6, Canada. His research interests encompass understanding the environmental impact on human activities, such as health behaviors and crime behaviors.