

PROCEEDINGS OF SPIE

International Conference on Remote Sensing, Mapping, and Geographic Systems (RSMG 2023)

**Feiyue Mao
Chunmei Wang
Zhaowu Yu**
Editors

**7–9 July 2023
Henan, China**

Organized by
Henan University (China)

Sponsored by
AEIC—Academic Exchange Information Centre (China)
Northwest University (China)

Published by
SPIE

Volume 12815

Proceedings of SPIE 0277-786X, V. 12815

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

International Conference on Remote Sensing, Mapping, and Geographic Systems (RSMG 2023),
edited by Feiyue Mao, Chunmei Wang, Zhaowu Yu, Proc. of SPIE Vol. 12815,
1281501 · © 2023 SPIE · 0277-786X · doi: 10.1117/12.3015065

Proc. of SPIE Vol. 12815 1281501-1

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:
Author(s), "Title of Paper," in *International Conference on Remote Sensing, Mapping, and Geographic Systems (RSMG 2023)*, edited by Feiyue Mao, Chunmei Wang, Zhaowu Yu, Proc. of SPIE 12815, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X
ISSN: 1996-756X (electronic)

ISBN: 9781510668898
ISBN: 9781510668904 (electronic)

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time)
SPIE.org
Copyright © 2023 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIE. DIGITAL LIBRARY
SPIDigitalLibrary.org

Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

xi *Conference Committee*

REMOTE SENSING DATA FUSION AND IMAGE PROCESSING

- 12815 02 **A remote sensing image classification method based on residual network and attention mechanism** [12815-35]
- 12815 03 **Building shadow extraction and height calculation using GF-2 remote sensing images** [12815-78]
- 12815 04 **Estimation and analysis of carbon storage in Wuhan based on multi-source data fusion** [12815-105]
- 12815 05 **Remote-sensing retrieval of total phosphorus in Tiande Lake by optimizing an XGBoost machine learning model** [12815-74]
- 12815 06 **Design and implementation of an ecological big data sharing incentive system based on contract theory and game theory** [12815-4]
- 12815 07 **Optimization of interpolation weight coefficient calculation based on the coupling of minimum cross entropy algorithm and Kriging algorithm** [12815-42]
- 12815 08 **A remote sensing extraction method for built-up area combining nighttime light data and optical remote sensing data in small and medium-sized cities** [12815-82]
- 12815 09 **A comparative study of forest extraction methods in the Yellow River basin (Gansu section) based on multi-source remote sensing data** [12815-123]
- 12815 0A **Quantification of sedimentation in the Yellow River estuary based on GIS remote sensing technology** [12815-111]
- 12815 0B **Oil spill detection in SAR images based on improved mask R-CNN model** [12815-38]
- 12815 0C **Accuracy comparison and analysis of interpolation methods in DEM generation with 3D laser point cloud data** [12815-51]
- 12815 0D **Level merging attention based on dense network for remote sensing image scene classification** [12815-102]
- 12815 0E **Urban impervious surface monitoring from time series high resolution remote sensing images with time-invariant spectral features** [12815-5]
- 12815 0F **An improved lightweight model for oil spill detection using dual-polarization SAR image** [12815-15]

- 12815 OG **Study on basic characteristic and distribution of debris flow and database query system along Zha-Mo Highway** [12815-52]
- 12815 OH **High-resolution remote sensing image building contour extraction based on super pixel segmentation and LBP features** [12815-47]
- 12815 OI **Difference analysis of peanut remote sensing extraction based on Sentinel-2 and Landsat-8 of GEE** [12815-79]
- 12815 OJ **Dual U-Nets autoencoders for unsupervised hyperspectral image super-resolution** [12815-59]
- 12815 OK **Dynamic monitoring of ecological environment quality in the lower Yellow River region using remote sensing ecological index** [12815-20]
- 12815 OL **Study on water and heat fluxes of typical underlying surface in the old course of Yellow River based on remote sensing and Eddy covariance system** [12815-93]
- 12815 OM **High wind speed retrieval from SAR images using random forest algorithm** [12815-43]
- 12815 ON **Gridless high-resolution sparse ISAR imaging method based on atomic norm minimization with Hankel-Toeplitz model** [12815-6]
- 12815 OO **A fast estimation of topographic slope based on Chang'e-3 descent images** [12815-48]
- 12815 OP **Feature parameters collaborative inversion based on optical and SAR data** [12815-113]
- 12815 OQ **Regional winter wheat yield estimation based on CASA model and improved harvest index using remote sensing images** [12815-75]
- 12815 OR **Holistically guided feature for semantic segmentation of high resolution remote sensing images** [12815-83]
- 12815 OS **Remote sensing image scene classification based on transfer learning and Swin transformer mode.** [12815-91]

SPATIAL INFORMATION ENGINEERING AND SURVEYING AND MAPPING TECHNOLOGY

- 12815 OT **Application of articulated arm coordinate measuring machine in industrial measurement field** [12815-114]
- 12815 OU **Application and research of indoor large size measuring standard device** [12815-103]
- 12815 OV **Estimating and analyzing the spatiotemporal patter of net primary productivity in Qinba area by combing remote sensing data and BIOME-BGC Model** [12815-120]
- 12815 OW **CNN-based inversion of chlorophyll-a in the Bohai Sea with spatio-temporal variation characterization of driving forces** [12815-17]

- 12815 0X **3D atrous spatial pyramid pooling based multi-scale feature fusion network for hyperspectral image classification** [12815-12]
- 12815 0Y **A method for detecting parallelism and flatness of truss tracks** [12815-81]
- 12815 0Z **Research on the relationship between agricultural mechanization and land urbanization change based on RS and GIS spatial analysis** [12815-92]
- 12815 10 **Research on the method of monitoring cross-border based on InSAR technology** [12815-94]
- 12815 11 **Study on the spatial patter of small towns based on computer image processing and image recognition: taking Guanhaiwei Town of Cixi as an example** [12815-129]
- 12815 12 **Design and realization of a 3D and user-oriented auxiliary system for electric power engineering field survey** [12815-65]
- 12815 13 **Spatio-temporal characteristics and spread of COVID-19 in China from the perspective of cities** [12815-41]
- 12815 14 **Study on deformation monitoring of coal mine shaft based on improved double baseline steel wire method** [12815-18]
- 12815 15 **The spatial differentiation and impact factor of eco-environment in Huai River Basin based on the improved RSEI model** [12815-39]
- 12815 16 **Dynamic monitoring and evolution analysis of wetland in Guangdong-Hong Kong-Macao Greater Bay area from 2005 to 2020** [12815-117]
- 12815 17 **Conflict measurement and ecological space optimization of production–living–ecological in nine cities along the Yellow River in Shandong Province** [12815-23]
- 12815 18 **An urban heat island functional zoning approach based on weighted kernel K-means** [12815-110]
- 12815 19 **Support vector machine based light pollution risk evaluation in Shanghai** [12815-86]
- 12815 1A **Spatio-temporal evolution of land use and carbon sink effect of forest ecosystem in Dabie Mountains** [12815-100]
- 12815 1B **Modified model based on random surface integral geometric attenuation factor** [12815-14]
- 12815 1C **Design and implementation of an insect monitoring system based on Python** [12815-49]
- 12815 1D **Wave measurement algorithm design based on motion reference unit** [12815-28]
- 12815 1E **Urban expansion coordination study based on NPP/VIIRS night light data** [12815-25]
- 12815 1F **SAR pulse radio frequency interference suppression based on modified eigen subspace projection** [12815-63]

ECOLOGICAL SURVEY AND GEOLOGICAL STRUCTURE ANALYSIS

- 12815 1G **Lithodemic unit identification for Huashan rock mass based on aeromagnetic anomaly boundary enhancement** [12815-36]
- 12815 1H **A study of metallogenic potential index of ores from the Bayan Obo Nb-Fe-REE deposit and its indication of geometallurgy and remote sensing exploration** [12815-126]
- 12815 1I **Design of efficient data acquisition and calculation of ground disaster system based on FPGA** [12815-132]
- 12815 1J **Tsunami risk research on coastal areas in Fujian Province, China** [12815-99]
- 12815 1K **Hydrocarbon microseepage information extracting and oil-gas prospective area prediction based on landsat-8 remote sensing images** [12815-71]
- 12815 1L **Survey and analysis of geological disasters on the Western Sichuan Plateau based on GIS: taking Danba County as an example** [12815-77]
- 12815 1M **Application of logging instrument in directional long drilling for gas drainage** [12815-96]
- 12815 1N **Regulation of surface thermal environment by different land cover types based on Google Earth engine** [12815-124]
- 12815 1O **Estimation and spatiotemporal variations of black carbon aerosol over the North China Plain in 2018** [12815-107]
- 12815 1P **Current activity of Handong fault in Handan** [12815-127]
- 12815 1Q **Enhancing surface soil moisture estimation in agricultural fields: a combined approach of improved WCM and CNN** [12815-13]
- 12815 1R **Application of internet of things technology in automatic monitoring of geological disasters** [12815-50]
- 12815 1S **Variability of glacier velocity and the influencing factors in the Saint Elias Mountains, Southeastern Alaska** [12815-32]
- 12815 1T **Exploration on the relationship between earthquake-triggered landslides and tectonics in the Himalayan Subduction Zone** [12815-40]
- 12815 1U **A method for identifying Chinese place names in typhoon events based on lattice-BiLSTM-CRF** [12815-34]
- 12815 1V **Numerical simulation of the impact and prediction of oil spill diffusion in the supporting berth project of Wenzhou** [12815-53]
- 12815 1W **Research on automatic modeling method for railway linear structures** [12815-16]

- 12815 1X **A study on identification of key factors influencing microtopography prone to ice accretion in plateau mountainous areas** [12815-54]
- 12815 1Y **Simulation of evapotranspiration of marsh meadow in Qinghai Lake Basin based on machine learning model** [12815-3]
- 12815 1Z **Research on the impact of land use change on ecological environment quality under remote sensing images: a case study of Hangzhou Bay new area** [12815-89]
- 12815 20 **Research on technical system of environmental comprehensive perception** [12815-55]
- 12815 21 **Wetland classification in the Guangdong-Hong Kong-Macao Greater Bay Area based on GEE and aux-coatnet** [12815-118]
- 12815 22 **Artemis III pre-selected landing sites engineering suitability analysis with illumination, communication and slope, based on LOLA terrain** [12815-29]
- 12815 23 **Accurate extraction of crop planting types in Southwest mountainous areas based on hierarchical extraction** [12815-30]
- 12815 24 **Calcite cement occurrences and origins in Upper Triassic Yanchang formation sandstones, Ordos Basin, China** [12815-31]
- 12815 25 **An investigation of brightness temperature anomalies before medium-strong earthquakes** [12815-68]
- 12815 26 **Spatial and temporal evolution of disaster situation based on social media: a case study of the 2018 Beijing rainstorm** [12815-69]
- 12815 27 **Prediction of subsidence in Ruzhou City based on random forest and SBAS-InSAR** [12815-67]

GEOINFORMATICS AND SATELLITE NAVIGATION SYSTEM

- 12815 28 **An entropy method-based Newton model for port hinterland division: case study of ports in Northeast China** [12815-2]
- 12815 29 **Response of the first order spectrum of radar for severe tropical storm Lionrock at high frequency surface waves** [12815-131]
- 12815 2A **Dynamic changes and future trends of vegetation in Inner Mongolia from 2001 to 2021** [12815-133]
- 12815 2B **An ultra-wideband MIMO ground-penetrating imaging system** [12815-106]
- 12815 2C **Hydrometeorological characteristics of the basin-wide flood in the Yangtze River basin** [12815-57]
- 12815 2D **Design and implementation of spaceborne SAR radio frequency interference detection and suppression system** [12815-80]

- 12815 2E **Blind-block reconstruction network with a guard window for hyperspectral anomaly detection** [12815-66]
- 12815 2F **BDS urban positioning based on improved sparse estimation** [12815-84]
- 12815 2G **Modeling technology for fusion of massive strip 3D terrain and feature models** [12815-58]
- 12815 2H **Research on railroad line spatial information management technology** [12815-101]
- 12815 2I **A robust optical navigation method for pin-point landing of asteroid based on 3D navigation features** [12815-27]
- 12815 2J **Application and evaluation of GF-1 and GF-1B satellite data for total suspended solids (TSS) monitoring in coastal waters south of Yantai, China** [12815-56]
- 12815 2K **Geo-information security technology research progress and suggestions for development ideas** [12815-125]
- 12815 2L **Establishment of ZTD model based on back propagation neural networks** [12815-22]
- 12815 2M **Airborne five-channel imaging spectrometer** [12815-24]
- 12815 2N **Scheme design of remote sensing satellite constellation based on guidance information** [12815-11]
- 12815 2O **Simulation of acoustic wave based on preserved-amplitude one-way in very low frequency** [12815-87]
- 12815 2P **Application analysis of Wuchuan radar ROSE 2.0 in a severe hail process in Pengshui** [12815-45]
- 12815 2Q **Soil classification with hyper-temporal satellite images** [12815-44]
- 12815 2R **Improved framework of FMCW signal processing based on the PS end of FPGA** [12815-7]
- 12815 2S **Composite electromagnetic scattering and SAR imaging of the topographical environment** [12815-95]
- 12815 2T **Unleashing the power of OpenStreetMap tags: a graph neural network approach for efficient LiDAR point cloud classification** [12815-62]
- 12815 2U **Cross spatio-temporal attention network for change detection** [12815-8]
- 12815 2V **A regional positioning system for transformer substation based on BDS/INS/UWB** [12815-76]
- 12815 2W **A 3D modelling method for road based on vehicle laser point cloud** [12815-21]

12815 2X

A point cloud classification network with steadily increasing feature dimensions and attention mechanism [12815-37]

Conference Committee

Conference General Chair

Jiayao Wang, Henan University (China)

Honorary Chair

Yongwei Sheng, University of California (United States)

Organizing Committee Chair

Chunmin Zhang, Xi'an Jiaotong University (China)

Technical Committee Chairs

Peter Penev, University of Architecture (Bulgaria)

Ashraf Dewan, Curtin University (Australia)

Organizing Committee Members

Jiayao Wang, Chinese Academy of Engineering (China)

Qiangzi Li, Russian Academy of Natural Sciences (Russian Federation)

Bailian Li, American Academy of Human Ecology (United States)

Shenglei Fu, Henan University (China)

Changhong Miao, Henan University (China)

Jiajun Qiao, Henan University (China)

Guanpeng Dong, Henan University (China)

Yaoping Cui, Henan University (China)

Jinwei Dong, University of Chinese Academy of Sciences (China)

Hongbo Ling, Chinese Academy of Sciences (China)

Milan Konecny, Masaryk University (The Czech Republic)

Feiyue Mao, Wuhan University (China)

Chunmei Wang, Northwest University (China)

Fengchang Xue, Nanjing University of Information Science & Technology (China)

Huan Yu, Chengdu University of Technology (China)

Maja Molna, Josip Juraj Strossmayer University of Osijek (Croatia)

Jan Kratzer, Technische Universität Berlin (Germany)

Yansheng Li, Wuhan University (China)

Lili Li, Zhejiang Ocean University (China)

Weiyue Li, Shanghai Normal University (China)

Zhaowu Yu, Fudan University (China)

Ashraf Dewan, Curtin University (Australia)

Siaka Abdulfatai, Federal University (Nigeria)
Azad Rasul, Soran University (Iraq)
Bin Hu, Henan University (China)

Technical Program Committee Members

Miro Govedarica, University of Novi Sad (Serbia)
Massimiliano Pepe, Università degli Studi "Gabriele d'Annunzio" (Italy)
Ran Duan, The Hongkong Polytechnic University (China)
Jian Yang, China University of Geosciences (China)
Chen Tao, China University of Geosciences (China)
Thota Sivasankar, NIIT University (India)
Yufu Zang, Nanjing University of Information Science & Technology
(China)
Qingyun Yan, Nanjing University of Information Science & Technology
(China)
Li Wei, Lanzhou, Jiaotong University (China)
Qingzhi Zhao, Xi'an University of Science and Technology (China)
Tao Zhang, Beijing Institute of Satellite Information Engineering
(China)
Anxin Ding, Hefei University of Technology (China)