PROCEEDINGS OF SPIE

Earth Resources and Environmental Remote Sensing/GIS Applications XV

Karsten Schulz
Ulrich Michel
Konstantinos G. Nikolakopoulos
Editors

16–19 September 2024
Edinburgh, United Kingdom

Sponsored by
SPIE

Event Sponsor
Leonardo MW Ltd. (United Kingdom)

General Sponsors
HGH Infrared Systems (France) • Photon Lines Ltd. (United Kingdom) • Pro-Lite Technology Ltd. (United Kingdom) • Thales (United Kingdom)

Cooperating Organisations
Cranfield University (United Kingdom) • Quantum Security and Defense Working Group (United Kingdom) • CENSIS (United Kingdom) • Innovate UK (United Kingdom) • Optoelectronics Research Centre (United Kingdom) • Photonics21 (Germany) • Technology Scotland (United Kingdom) • Science and Technology Facilities Council (United Kingdom) UKQuantum (United Kingdom) • Visit Britain (United Kingdom)

Published by
SPIE

Volume 13197

Proceedings of SPIE 0277-786X, V. 13197

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

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 SPIEDigitalLibrary.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 *Earth Resources and Environmental Remote Sensing/GIS Applications XV*, edited by Karsten Schulz, Ulrich Michel, Konstantinos G. Nikolakopoulos, Proc. of SPIE 13197, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510681026
ISBN: 9781510681033 (electronic)

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time)
SPIE.org
Copyright © 2024 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
SPIEDigitalLibrary.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

vii *Conference Committee*

ENVIRONMENTAL MONITORING CONCEPTS I

13197 03 **From complexity to clarity: visualizing PolInSAR data for environmental monitoring** [13197-3]

ENVIRONMENTAL MONITORING CONCEPTS II: NET ZERO TRANSITION

13197 06 **Applying deep learning methods for the bridge-based monitoring of floating macroplastics on rivers** [13197-6]

INFRASTRUCTURES AND URBAN AREAS

13197 08 **Change detection using NewSpace SAR data** [13197-9]

13197 09 **Physics-informed decomposition of LOS displacement for infrastructure monitoring** [13197-10]

13197 0A **Remote sensing monitoring of infrastructure in complex and coastal areas** [13197-11]

EO USING GEE

13197 0B **Use of data from the advanced spaceborne thermal emission and reflection radiometer (ASTER) for the study of the urban heat island (UHI) in Bragança (Portugal) (2000-2023)** [13197-12]

13197 0C **Automatic lineament extraction, using Sentinel-1 data, in the Ria de Vigo, Spain** [13197-14]

HAZARD MITIGATION GEOLOGIC APPLICATIONS I

13197 0F **Mapping of large-scale flooding in Thessaly region using Sentinel data** [13197-17]

13197 0G **Using road detection and OSM reference data to refine airborne camera extrinsics in the Ahr Valley flooding use case** [13197-18]

13197 0H **Landslide monitoring: recent technologies and new perspectives** [13197-19]

13197 0I **An overview of the spatiotemporal patterns of land displacements in Western Greece** [13197-20]

13197 0J **Multitemporal characterization of landslide displacement patterns in the Andean region using InSAR** [13197-21]

HAZARD MITIGATION GEOLOGIC APPLICATIONS II

13197 0K **Decision tree algorithms applied to detect mineral alteration related to cobalt-nickel mineralisation in Asturias: insights of S34I project** [13197-22]

13197 0L **Application of band ratios to map hydrothermal alteration zones related to Au-Sb mineralization in Freixeda, Northern Portugal** [13197-24]

13197 0M **3D representation of a bauxite mine in the frame of m4mining project** [13197-25]

PROCESSING METHODOLOGIES I

13197 0O **On-orbit calibration and performance of the NOAA-21 VIIRS day-night band** [13197-27]

13197 0Q **An efficient technique for hazard susceptibility mapping using AHP- and ML-based models** [13197-30]

PROCESSING METHODOLOGIES II

13197 0R **Shadow detection and shadow removal: a benefit for land cover classification** [13197-32]

SATELLITE RS AND GROUND-BASED NONDESTRUCTIVE TECHNOLOGIES IN CIVIL AND ENVIRONMENTAL ENGINEERING I

13197 0U **Strategic directions of remote sensing to support the resilience of urban environments and communities** [13197-35]

13197 0V **Satellite remote sensing technologies for the investigation of the surface urban heat island (SUHI) phenomenon in Italian regional capitals: two different methodological approaches** [13197-43]

13197 0W **MIDS: monitoring of water infrastructures with satellite data** [13197-37]

13197 0X **Development of an operational infrastructure monitoring service for predictive maintenance based on Rheticus Safeway** [13197-38]

SATELLITE RS AND GROUND-BASED NONDESTRUCTIVE TECHNOLOGIES IN CIVIL AND ENVIRONMENTAL ENGINEERING II

13197 0Y **Integration of satellite monitoring data in a digital twin of transport infrastructure** [13197-44]

13197 0Z **Urban green infrastructure monitoring using remote sensing techniques** [13197-42]

13197 10 **LiDAR health monitoring of transport infrastructure: automatic damage detection using classification of point clouds** [13197-40]

13197 11 **Sentinel-2 and PRISMA satellite data for urban land classification in Tuscany region (TUS:CAN PROJECT)** [13197-36]

13197 12 **Monitoring double-track railway masonry bridge piers using ground-based interferometric radar and augmented reality** [13197-41]

REMOTE SENSING FOR ARCHAEOLOGY, PRESERVATION OF CULTURAL AND NATURAL HERITAGE

13197 13 **3D mapping of geological heritage: the case of the mythical waterfall of Styx** [13197-45]

13197 14 **The use of photogrammetry and NeRF techniques to document built heritage** [13197-46]

13197 15 **Accuracy assessment of different remote sensing technologies over the cultural heritage site of Helike, Achaea, Greece** [13197-47]

13197 16 **The monitoring of cultural heritage sites using digital twins** [13197-48]

13197 17 **Monitoring of archaeological sites submerged in shallow waters using Earth observation** [13197-49]

POSTER SESSION

13197 18 **Airborne images integration for a first cartographic approximation of critical raw-materials-rich placers on Santa Marta Beach (Ría de Vigo, NW Spain)** [13197-23]

13197 19 **Non-negative matrix factorization (NMF) in fire susceptibility** [13197-50]

13197 1A **Montrends: a Google Earth Engine application for analysing species habitat suitability over time** [13197-51]

13197 1B **Snow cover mapping based on a multi-index technique in Vitosha, Pirin and Rila mountains** [13197-52]

13197 1C **Multitemporal LiDAR-based terrain anomaly detection of Karstic environments in the Asturian Central Massif (Cantabrian Mountains, Northwest Spain)** [13197-55]