

PROCEEDINGS OF SPIE

Image and Signal Processing for Remote Sensing XXIX

**Lorenzo Bruzzone
Francesca Bovolo**
Editors

**4–5 September 2023
Amsterdam, Netherlands**

Sponsored by
SPIE

Cooperating Organisations
Cranfield University (United Kingdom)

Published by
SPIE

Volume 12733

Proceedings of SPIE 0277-786X, V. 12733

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

Image and Signal Processing for Remote Sensing XXIX, edited by Lorenzo Bruzzone,
Francesca Bovolo, Proc. of SPIE Vol. 12733, 1273301 · © 2023 SPIE
0277-786X · doi: 10.1117/12.3014130

Proc. of SPIE Vol. 12733 1273301-1

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 *Image and Signal Processing for Remote Sensing XXIX*, edited by Lorenzo Bruzzone, Francesca Bovolo, Proc. of SPIE 12733, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510666955
ISBN: 9781510666962 (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

vii *Conference Committee*

SESSION 1 PANSHARPENING AND SPATIAL ENHANCEMENT

- 12733 02 **Full-scale assessment of pansharpening: why literature indexes may give contradictory results and how to avoid such an inconvenience** [12733-1]
- 12733 03 **Super-resolution algorithm of lunar panchromatic image based on random degradation model** [12733-2]
- 12733 04 **Onboard deep learning for efficient small satellite reflectance retrievals and downlink** [12733-3]
- 12733 05 **Spatial resolution enhancement of hyperspectral images from miniaturized sensors** [12733-4]

SESSION 2 IMAGE PRE-PROCESSING

- 12733 06 **Super-resolution techniques for Sentinel-5P products** [12733-5]
- 12733 07 **Time-efficient intrinsic calibration of an automotive lidar sensor using a tabletop setup to reach subpixel precision** [12733-7]
- 12733 08 **Remote sensing image completion using a diffusion-based propagation algorithm** [12733-8]
- 12733 09 **Improved homographic adaptation for keypoint generation in cross-spectral registration of thermal and optical imagery** [12733-9]

SESSION 3 CHANGE DETECTION AND DAMAGE ASSESSMENT

- 12733 0A **A theoretical framework for unsupervised land cover change detection in dense satellite image time series** [12733-11]

SESSION 4 DEEP LEARNING FOR IMAGE CLASSIFICATION AND REGRESSION

- 12733 0D **A class-driven hierarchical ResNet for classification of multispectral remote sensing images (Best Student Paper Award)** [12733-16]
- 12733 0E **Large-scale LOD1 building extraction from a textured 3D mesh of a scene** [12733-17]

- 12733 OF **Enhancing land cover maps with optical time series and ambiguous loss function** [12733-18]
- 12733 OG **Deep learning methodologies for chemical dispersion map reconstruction** [12733-19]
- 12733 OH **A deep multiple instance learning approach based on coarse labels for high-resolution land-cover mapping** [12733-20]

SESSION 5 OBJECT DETECTION AND UNMIXING

- 12733 OI **Automated method for generating datasets of infrared or visible images for context-specific training of deep neural network-based object detectors** [12733-21]
- 12733 OJ **Improve target detection on hyperspectral aerial images using simulated atmosphere conditions** [12733-22]
- 12733 OK **Spatial information extraction of oil well sites based on medium-resolution satellite imagery** [12733-23]
- 12733 OL **Moving ship detection of satellite video based on a weakly supervised detector** [12733-24]

SESSION 6 ACCURACY ASSESSMENT AND BIG DATA ANALYSIS

- 12733 OM **Accuracy assessment of land-use-land-cover maps: the semantic gap between in situ and satellite data** [12733-26]
- 12733 ON **Linking Earth observation data with ground truth from the open web** [12733-27]
- 12733 OO **Multi-year monitoring of wheat phenology and effect of climate change in the south Asian region using Sentinel-2 NDVI time series analysis** [12733-28]
- 12733 OP **A GPU-accelerated algorithm for copy move detection in large-scale satellite images** [12733-29]
- 12733 OQ **A convolutional neural network approach to the detection of LC transitions in multi-annual satellite image time series** [12733-30]

SESSION 7 SAR AND RADAR DATA ANALYSIS

- 12733 OR **Ground-based SAR system for object classification with parameter optimization based on deep learning feedback algorithm** [12733-31]
- 12733 OS **Convolutional deep learning network for InSAR phase denoising and unwrapping** [12733-32]

12733 OT **Maritime ship tracking based on SAR constellation: a preliminary implementation** [12733-33]

POSTER SESSION

12733 OW **A study on the impact of the spatial and spectral resolution on plant species richness in Mediterranean regions using optical remote sensing data** [12733-37]

12733 OY **Semi-supervised hyperspectral unmixing dataset creation methods for unmixing algorithm analysis** [12733-39]

12733 OZ **Application of generative adversarial network: GAN to disaster damage monitoring** [12733-40]

12733 10 **Implementation of the RX algorithm in TensorFlow for high-performance computing** [12733-41]

12733 11 **Monitoring of renewable energy sources with remote sensing, open data, and field data in Bulgaria** [12733-42]

12733 12 **Detection of over-ground petroleum and gas pipelines from optical remote sensing images** [12733-43]

12733 14 **A remote sensing satellite image compression method based on conditional generative adversarial network** [12733-45]

12733 15 **Landslide susceptibility studies in Uttarakhand using novel machine learning-based model** [12733-46]

12733 16 **Image restoration techniques for space-based lightweight optically sparse aperture Earth-observation telescopes in the longwave infrared domain** [12733-47]

Conference Committee

Symposium Chair

Lorenzo Bruzzone, Università degli Studi di Trento (Italy)

Conference Chairs

Lorenzo Bruzzone, Università degli Studi di Trento (Italy)

Francesca Bovolo, Fondazione Bruno Kessler (Italy)

Conference Co-chair

Jon Atli Benediktsson, University of Iceland (Iceland)

Conference Programme Committee

Selim Aksoy, Bilkent University (Turkey)

Luciano Alparone, University degli Studi di Firenze (Italy)

Abdourrahmane M. Atto, University Savoie Mont Blanc (France)

Gustavo Camps-Valls, University de València (Spain)

Jocelyn Chanussot, Laboratory des Images et des Signaux (France)

Chi-Hau Chen, University of Massachusetts Dartmouth (United States)

B. S. Daya Sagar, Indian Statistical Institute, Bangalore (India)

Fabio Dell'Acqua, University degli Studi di Pavia (Italy)

Begüm Demir, Technische University Berlin (Germany)

Peijun Du, Nanjing University (China)

Andrea Garzelli, University degli Studi di Siena (Italy)

Jordi Inglada, Center d'Etudes Spatiales de la Biosphère (France)

Manolis Koubarakis, National and Kapodistrian University of Athens
(Greece)

Jun Li, Sun Yat-Sen University (China)

Sicong Liu, Tongji University (China)

José M. P. Nascimento, Instituto de Telecomunicações (Portugal)

Claudia Paris, University Twente (Netherlands)

Charlotte Pelletier, University de Bretagne Sud (France)

David Small, University Zürich (Switzerland)

Florence Tupin, Télécom ParisTech (France)

Benoit Vozel, University de Rennes 1 (France)

Josiane B. Zerubia, INRIA Sophia Antipolis - Méditerranée (France)

