PROCEEDINGS OF SPIE

Image and Signal Processing for Remote Sensing XXVII

Lorenzo Bruzzone Francesca Bovolo Jon Atli Benediktsson Editors

13–17 September 2021 Online Only, Spain

Sponsored by SPIE

Cooperating Organisations
European Optical Society
EARSeL—European Association of Remote Sensing Laboratories (Germany)
ISPRS—International Society for Photogrammetry and Remote Sensing
CENSIS (United Kingdom)
SEDOPTICA

Supporting Organisation INEUSTAR/INDUCIENCIA

Published by SPIE

Volume 11862

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 *Image and Signal Processing for Remote Sensing XXVII*, edited by Lorenzo Bruzzone, Francesca Bovolo, Jon Atli Benediktsson, Proc. of SPIE 11862, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510645684

ISBN: 9781510645691 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time)

SFIL.UIY

Copyright © 2021 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.



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

	CALIBRATION, IMAGE ENHANCEMENT, AND PANSHARPENING
11862 04	Cross-sensor radiometric normalization of Planet smallsat data using Sentinel-2 to improve consistency across scenes and environments [11862-1]
11862 05	Video stabilization method corresponding to various imagery for geostationary optical Earth observation satellite [11862-2]
11862 06	The discrete system of Fibonacci functions for the construction of a global automated system for monitoring objects littering the environment using remote sensing [11862-3]
11862 07	An object-based fuzzy prior knowledge sparse coding algorithm for image fusion [11862-4]
11862 08	Performance of pansharpening methods varying with input data formats [11862-5]
	DEEP LEARNING FOR THE ANALYSIS OF MULTISPECTRAL IMAGES I
11862 09	A new method for geomorphological studies on aerial images and land-cover classification using machine learning techniques [11862-6]
11862 0A	Stereo matching of remote sensing images using deep stereo matching [11862-7]
11862 OB	Object detection with noisy annotations in high-resolution remote sensing images using robust EfficientDet [11862-8]
11862 OC	Few shot object detection in remote sensing images [11862-9]
11862 0D	Fire segmentation using a SqueezeSegv2 [11862-10]
	DEEP LEARNING FOR THE ANALYSIS OF MULTISPECTRAL IMAGES II
11862 OE	Deep-learning-based remote sensing video super-resolution for Jilin-1 satellite [11862-11]
11862 OF	Useable machine learning for Sentinel-2 multispectral satellite imagery [11862-12]
11862 0G	Self-supervised multi-task learning for semantic segmentation of urban scenes [11862-13]

DEEP LEARNING FOR THE ANALYSIS OF HYPERSPECTRAL AND SAR IMAGES

11862 OH	Impact of different compression rates for hyperspectral data compression based on a convolutional autoencoder [11862-16]
11862 OI	Hyperspectral image classification using spectral-spatial hypergraph convolution neural network [11862-17]
11862 OJ	A new data augmentation technique for the CNN-based classification of hyperspectral imagery [11862-18]
11862 OK	Superpixel based graph convolutional neural network for SAR image segmentation [11862-19]
11862 OL	Multi-scale attention guided recurrent neural network for deformation map forecasting [11862-20]
	CHANGE DETECTION AND MULTITEMPORAL ANALYSIS
11862 0M	Multimodal change monitoring using multitemporal satellite images [11862-21]
11862 0O	Multi-year crop type mapping using pre-trained deep long-short term memory and Sentinel 2 image time series [11862-23]
11862 OP	Change detection method for intensity VHF wavelength-resolution SAR images [11862-24]
	COMPRESSION AND RADAR DATA ANALYSIS
11862 OQ	Discrete atomic compression of satellite images: a comprehensive efficiency research [11862-25]
11862 OR	Lossy compression of three-channel remote sensing images with controllable quality [11862-26]
11862 OS	Multifractal classification of Sentinel-1 SAR images of ice-covered sea areas [11862-27]
11862 OT	Transfer learning for the semantic segmentation of cryoshpere radargrams [11862-28]
11862 OU	A novel integrated radar sounder simulation technique for modelling large and small-scale surface scattering phenomena [11862-29]
	POSTER SESSION
11862 OW	Feature profiles for semisupervised hyperspectral image classification with limited labeled training samples [11862-31]

11862 0X	High spatial-resolution has little impact on NDVI mean value of UAV-based individual tree-level mapping: evidence from 9 field tests and implications [11862-32]
11862 OY	Detection of industrial storage tanks at the city-level from optical satellite remote sensing images [11862-33]
11862 OZ	Research of compression characteristics of modulated ultra-wideband signals formed on the basis of circulants of quasi-orthogonal matrices [11862-34]
11862 10	Airbus ship detection from satellite imagery using frequency domain learning [11862-35]
11862 13	Robust anomaly detection algorithm for hyperspectral images using spectral unmixing [11862-38]
11862 15	Hyperspectral image change detection based on intrinsic image decomposition feature extraction [11862-40]