PROCEEDINGS OF SPIE

Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XXI

Miguel Velez-Reyes
Fred A. Kruse
Editors

21–23 April 2015
Baltimore, Maryland, United States

Sponsored and Published by
SPIE

Volume 9472

Proceedings of SPIE 0277-786X, V. 9472

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

Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XXI,
edited by Miguel Velez-Reyes, Fred A. Kruse, Proc. of SPIE Vol. 9472, 947201
© 2015 SPIE · CCC code: 0277-786X/15/$18 · doi: 10.1117/12.2202198

The papers included 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. The papers published in these proceedings 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 this book:
Author(s), "Title of Paper," in *Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XXI*, edited by Miguel Velez-Reyes, Fred A. Kruse, Proceedings of SPIE Vol. 9472 (SPIE, Bellingham, WA, 2015) Article CID Number.

ISSN: 0277-786X
ISBN: 9781628415889

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445
SPIE.org

Copyright © 2015, Society of Photo-Optical Instrumentation Engineers.

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 copying fees. The Transactional Reporting Service base fee for this volume is $18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online 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. The CCC fee code is 0277-786X/15/$18.00.

Printed in the United States of America.

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

SPIE Digital Library
SPIEDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print. Papers are published as they are submitted and meet publication criteria. A unique citation identifier (CID) number is assigned to each article at the time of the first 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, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four 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. The complete citation is used on the first page, and an abbreviated version on subsequent pages.

Contents

Authors

Numbers in the index correspond to the last two digits of the six-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first four digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Conference Committee

Symposium Chairs

Nils R. Sandell Jr., Strategic Technology Office, DARPA (United States)

Symposium Co-chair

David A. Logan, BAE Systems (United States)

Conference Chairs

Miguel Velez-Reyes, The University of Texas at El Paso (United States)
Fred A. Kruse, Naval Postgraduate School (United States)

Conference Program Committee

Eustace L. Dereniak, College of Optical Sciences, The University of Arizona (United States)
Michael T. Eismann, Air Force Research Laboratory (United States)
Glenn E. Healey, University of California, Irvine (United States)
Jacqueline J. Le Moigne, NASA Goddard Space Flight Center (United States)
David W. Messinger, Rochester Institute of Technology (United States)
Dalton S. Rosario, U.S. Army Research Laboratory (United States)
Alan P. Schaum, U.S. Naval Research Laboratory (United States)
James Theiler, Los Alamos National Laboratory (United States)
Grady Tuell, Georgia Tech Research Institute (United States)

Session Chairs

1 Spectral Detection, Identification, and Quantification
Miguel Velez-Reyes, The University of Texas at El Paso (United States)
Fred A. Kruse, Naval Postgraduate School (United States)

2 Spectral Data Compression and Dimensionality Reduction
Dalton S. Rosario, U.S. Army Research Laboratory (United States)

3 Spectral Signature Modeling, Measurements, and Applications I
Michael T. Eismann, Air Force Research Laboratory (United States)

4 SHARE 2012 Analysis Results
John Kerekes, Rochester Institute of Technology (United States)