PROCEEDINGS OF SPIE

Multimodal Image Exploitation and Learning 2021

Sos S. Agaian Vijayan K. Asari Stephen P. DelMarco Sabah A. Jassim Editors

12–16 April 2021 Online Only, United States

Sponsored and Published by SPIE

Volume 11734

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 Multimodal Image Exploitation and Learning 2021, edited by Sos S. Agaian, Vijayan K. Asari, Stephen P. DelMarco, Sabah A. Jassim, Proc. of SPIE 11734, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510643055

ISBN: 9781510643062 (electronic)

Published by

SPIF

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

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

INNOVATIVE IMAGING TECHNIQUES 11734 02 Land cover analysis using satellite imagery for humanitarian mine action and ERW survey **(Invited Paper)** [11734-1] 11734 03 Adaptive inertia weight particle swarm algorithm for optimized hyperspectral image enhancement [11734-2] 11734 04 Multi-template multi-channel image matching using tensor products of low-dimensional Clifford algebras [11734-3] 11734 05 No-reference transform-based quality assessment for imaging applications [11734-4] DATA REGISTRATION AND FUSION 11734 07 A multi-camera system for vision-based altitude estimation [11734-6] 11734 09 FEAR: feature extraction for aerial registration in large-scale LiDAR point clouds [11734-8] Determination of tool cutting surface quality from analysis on a group of images and the 11734 0A combined data [11734-9] **DEEP LEARNING APPLICATIONS** Sensitivity and stability of pretrained CNN filters [11734-10] 11734 OB 11734 0D Cybersecurity enhancement using recurrent neural networks and keystroke dynamics [11734-12] 11734 OE Diagnosing COVID-19 pneumonia from x-ray and CT images using deep learning and transfer learning algorithms [11734-26] MEDICAL IMAGING PROCESSING 11734 0G Towards optimal cropping: breast and liver tumor classification using ultrasound images [11734-15] 11734 OI Lung infection region quantification, recognition, and virtual reality rendering of CT scan of **COVID-19** [11734-16]

A model-based adaptive method for speckle noise reduction in ultrasound images of ovarian tumours: a new approach [11734-17]

POSTER SESSION

11734 OK	A block-based method for the remote sensing images cloud detection and removal [11734-18]
11734 OL	COVID-19 detection in CT images using custom weighted filter-based CNN [11734-19]
11734 OM	COVID-19 face mask detection in a crowd using multi-model based on YOLOv3 and hand-crafted features [11734-20]
11734 0O	Semi-supervised learning for improved post-disaster damage assessment from satellite imagery [11734-22]
11734 OP	A deep neural network approach for detecting wrong-way driving incidents on highway roads [11734-23]
11734 OQ	Joint image enhancement and localization framework for vehicle model recognition in the presence of non-uniform lighting conditions [11734-24]
11734 OR	Block-based contrast enhancement method for medical application [11734-25]