

PROCEEDINGS OF SPIE

Optics and Photonics for Information Processing XIV

A. A. S. Awwal
K. M. Iftakharuddin
V. H. Diaz-Ramirez
A. Márquez
Editors

24 August – 4 September 2020
Online Only, United States

Sponsored and Published by
SPIE

Volume 11509

Proceedings of SPIE 0277-786X, V. 11509

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 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 *Optics and Photonics for Information Processing XIV*, edited by A. A. S. Awwal, K. M. Iftekharruddin, V. H. Diaz-Ramirez, A. Márquez, Proceedings of SPIE Vol. 11509 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510638242

ISBN: 9781510638259 (electronic)

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 © 2020, 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 \$21.00 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/20/\$21.00.

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: *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article 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

COMPUTER VISION ALGORITHMS

- 11509 03 **Autonomous navigation for a holonomic drive robot in an unknown environment using a depth camera** [11509-1]
- 11509 04 **Gender classification of full-body biological motion of aperiodic actions using machine learning** [11509-2]
- 11509 05 **Mapping and navigation in an unknown environment using LiDAR for mobile service robots** [11509-3]
- 11509 06 **Stereo vision parallelization for three-dimensional reconstruction** [11509-4]
- 11509 07 **A method of registering point cloud with CAD model based on line contour matching** [11509-5]
- 11509 08 **Characterization of biomedical images using Walsh filters followed by convolution** [11509-6]

DIGITAL OPTICS PROCESSING

- 11509 09 **Thermal transient stepping: a powerful thermal-based approach for evaluating the stress field by using digital photoelasticity** [11509-7]
- 11509 0A **Analysis of algebraic and geometric distances for projective transformation estimation** [11509-8]
- 11509 0B **Stresses analysis through digital photoelasticity and infrared thermography in an epoxy sample affected by cyclic loads: a cost-effective proposal** [11509-9]
- 11509 0C **Asymmetric color image encryption using singular value decomposition and chaotic Tinkerbell map in fractional Fourier domain** [11509-10]

IMAGING TECHNOLOGIES AND APPLICATIONS

- 11509 0E **Analysis of three-dimensional object reconstruction algorithms based on multi-camera arrays** [11509-12]

IMAGING ANALYSIS AND OPTICAL COMMUNICATIONS

- 11509 OI **Pattern recognition based strategy to evaluate the stress field from dynamic photoelasticity experiments** [11509-16]
- 11509 OJ **Pose estimation from projective transformations for visual guidance of a wheeled mobile robot** [11509-17]
- 11509 OK **Improving free-space optical communication with adaptive optics for higher order modulation** [11509-18]
- 11509 OL **Mitigating polarisation mode dispersion for enhanced capacity in polarisation division multiplexed (PDM-QAM) optical fiber communication link using hybrid optical amplifier** [11509-19]
- 11509 OM **Color imaging through a scattering layer from one grayscale speckle pattern** [11509-20]

POSTER SESSION

- 11509 ON **Using carbon nanoparticles for reconstruction of optical speckle field structure** [11509-21]
- 11509 OO **Development of drowsiness predicting system using respiration curve on image information processing** [11509-22]
- 11509 OP **Polarization reconstruction of birefringence of the polycrystalline component of biological tissues with different damage durations** [11509-23]
- 11509 OQ **Higher-order numerical derivatives for photonic applications** [11509-24]
- 11509 OS **Electrical equivalent circuit of bistable serially connected PIN diodes** [11509-26]
- 11509 OT **Azimuthally invariant Mueller-matrix microscopy in the differential diagnosis of cerebral infraction** [11509-27]
- 11509 OU **Diagnosis and differentiation of joint pathology by spectral polarimetry of the parameters of the Stokes vector microscopic images of the optically active component of the synovial fluid** [11509-28]
- 11509 OV **3D Stokes correlometry of the polycrystalline structure of biological tissues** [11509-29]
- 11509 OW **Methods and means of Fourier Stokes polarimetry of networks of biological crystals** [11509-30]
- 11509 OX **Differential diagnostics of aseptic and septic loosening of the cup of the endoprosthesis of the artificial hip joint by the methods of polarization tomography** [11509-31]

- 11509 0Z **Comparison of melanin content of tiny moles versus normal skin sites using diffuse reflectance spectroscopy** [11509-33]
- 11509 10 **Imaging an extended object through a thin scattering layer via various point spread functions** [11509-34]