

PROCEEDINGS OF SPIE

*2021 International Conference on Optical
Instruments and Technology*

Optoelectronic Imaging/Spectroscopy and Signal Processing Technology

Guohai Situ
Xun Cao
Xiaopeng Shao
Chao Zuo
Wolfgang Osten
Editors

8–10 April 2022
Online Only, China

Sponsored by
CIS – China Instrument and Control Society (China)

Cosponsored and Published by
SPIE

Volume 12281

Proceedings of SPIE 0277-786X, V. 12281

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 *2021 International Conference on Optical Instruments and Technology: Optoelectronic Imaging/Spectroscopy and Signal Processing Technology*, edited by Guohai Situ, Xun Cao, Xiaopeng Shao, Chao Zuo, Wolfgang Osten, Proc. of SPIE 12281, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510655676

ISBN: 9781510655683 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2022 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

v	<i>Symposium Committee</i>
vii	<i>Conference Committee</i>
ix	<i>Introduction</i>
xi	<i>Organizers</i>

OPTOELECTRONIC IMAGING/SPECTROSCOPY AND SIGNAL PROCESSING TECHNOLOGY I

12281 02	Improvement of imaging quality of SPIDER by dictionary learning [12281-2]
12281 03	Adaptive compressive coding method based on spectral image region segmentation [12281-30]
12281 04	Ethylene sensor for plant maturity monitoring based on photoacoustic spectroscopy [12281-15]

OPTOELECTRONIC IMAGING/SPECTROSCOPY AND SIGNAL PROCESSING TECHNOLOGY II

12281 05	Instant inpainting using multiscale prior conditioned propagation optimization [12281-22]
12281 06	Attention-based denoising for polarimetric images [12281-32]

POSTER SESSION

12281 07	A moving weak and small target detection algorithm for multispectral image sequences [12281-1]
12281 08	Design and implementation of dual-software dual-light imaging system and fusion algorithm [12281-3]
12281 0A	Video super-resolution reconstruction of weak and small target in sea background based on channel attention mechanism [12281-6]
12281 0B	An optimized gray-scale stretch imaging correction method for contact image sensor line array camera [12281-8]
12281 0C	Optical field reconstruction by self-referenced interference and its application in the orbital angular momentum spectrum measurement [12281-9]

- 12281 0D **Development of hardware circuit for a long-wave infrared detector based on Xilinx Zynq with SOPC architecture** [12281-13]
- 12281 0E **Research on infrared sequence image denoising based on multi-frame averaging and improved bilateral filtering** [12281-18]
- 12281 0F **Super-resolution network for x-ray security inspection** [12281-19]
- 12281 0G **Advanced deep learning enhancement algorithm based on retinex model guidance** [12281-21]
- 12281 0H **SAR image target recognition based on non-local operation** [12281-26]
- 12281 0I **SAR image despeckling algorithm using enhanced edge detection in bandelet domain** [12281-31]
- 12281 0J **Rapid automatic underwater image recovery method based on polarimetric imaging** [12281-100]