

PROCEEDINGS OF SPIE

International Conference on Optics and Image Processing (ICOIP 2021)

**Xizheng Ke
Fengxin Cen**
Editors

**4–6 June 2021
Guilin, China**

Organized by
Xi'an University of Technology (China)
Global Scientific Research Association (China)

Published by
SPIE

Volume 11915

Proceedings of SPIE 0277-786X, V. 11915

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

International Conference on Optics and Image Processing (ICOIP 2021), edited by Xizheng Ke,
Fengxin Cen, Proc. of SPIE Vol. 11915, 1191501 · © 2021 SPIE · CCC code: 0277-786X/21/\$21
doi: 10.1117/12.2608454

Proc. of SPIE Vol. 11915 1191501-1

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 *International Conference on Optics and Image Processing (ICOIP 2021)*, edited by Xizheng Ke, Fengxin Cen, Proc. of SPIE 11915, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X
ISSN: 1996-756X (electronic)

ISBN: 9781510646957
ISBN: 9781510646964 (electronic)

Published by
SPIE
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.

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

OPTICAL INFRARED DEVICE AND LASER TECHNOLOGY

- 11915 02 **Research progress and application of air refractive index measurement technology based on laser interference** [11915-20]
- 11915 03 **Research on packaging appearance based on visual communication and laser 3D printing technology** [11915-1]
- 11915 04 **Modeling and simulation for infrared radiation of global background** [11915-8]
- 11915 05 **Research progress and application of 6-DOF laser measurement technology** [11915-18]
- 11915 06 **Bifurcation in two spatial coupled different semiconductor lasers** [11915-19]
- 11915 07 **Wave-front restoration of orbital-angular-momentum beam based on phase diversity with GRNN** [11915-12]
- 11915 08 **Progress of NUV and FUV MCP-based photon-counting imaging detectors** [11915-16]
- 11915 09 **Multiple-dynamics behavior of two coupling semiconductor lasers synchronizes with that of another laser** [11915-21]
- 11915 0A **Small-scale pedestrian detection based on feature fusion refinement and improved Faster R-CNN** [11915-22]

APPLICATION OF IMAGE PROCESSING AND REMOTE SENSING IMAGING

- 11915 0B **Research on image preprocessing method of long-wave infrared polarization imaging** [11915-30]
- 11915 0C **Anti-counterfeiting image generation algorithm based on microstructure dots** [11915-6]
- 11915 0D **A robust extraction method for railway using sequential line detection** [11915-31]
- 11915 0E **Fusion method of multispectral and panchromatic images based on NSST and improved PCNN** [11915-15]
- 11915 0F **Millimeter wave and terahertz imaging technology** [11915-3]
- 11915 0G **Infrared image target recognition based on multiple matching methods** [11915-2]
- 11915 0H **Canopy recognition of cherry fruit tree based on SegNet network model** [11915-11]

- 11915 OI **Research on mixed type wafer map based on deep convolutional neural network** [11915-10]
- 11915 OJ **Application of edge detection algorithm in ink droplet forming process** [11915-4]
- 11915 OK **Correlation filter tracking based on multi-peak detection and adaptive coefficient** [11915-26]
- 11915 OL **Image inpainting based on priority values** [11915-28]
- 11915 OM **Horizontal drift correction by trajectory of sinogram centroid fitting for laboratory x-ray nanotomography** [11915-7]
- 11915 ON **Weld bead extraction based on point cloud segmentation** [11915-29]
- 11915 OO **Research on visual positioning based on dual UAV collaboration** [11915-25]
- 11915 OP **Fast acquisition system for laser communication based on beam splitting and expanding** [11915-27]
- 11915 OQ **Research on QR code image processing on the LED screen** [11915-5]
- 11915 OR **Underwater optical communication characteristics, current situation and prospects** [11915-13]
- 11915 OS **Research on classification method of food packaging character defects** [11915-23]