## AOPC 2020: Display Technology; Photonic MEMS, THz MEMS, and Metamaterials; and AI in Optics and Photonics

Z. Y. Xu Y. T. Wang Q. H. Wang L. C. Cao H. K. Xie C. K. Lee Y. H. Wang B. Yang H. B. Luo J. Cheng L. Fang Editors

30 November – 2 December 2020 Beijing, China

Sponsored by Chinese Society for Optical Engineering (CSOE) (China)

Technical Sponsor SPIE

Organized by

Chinese Society for Optical Engineering (CSOE) (China) • Academy of Opto-Electronics of Electronics Technology of China (China) • Science and Technology on Low-light-level Night Vision Laboratory (China) • Science and Technology on Electro-Optical Information Security Control (China)

Published by SPIE

Volume 11565

Proceedings of SPIE 0277-786X, V. 11565

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

AOPC 2020: Display Technology; Photonic MEMS, THz MEMS, and Metamaterials; and Al in Optics and Photonics, edited by Z. Y. Xu, Y. T. Wang, Q. H. Wang, L. C. Cao, H. K. Xie, C. K. Lee, Y. H. Wang, B. Yang, H. B. Luo, J. Cheng, L. Fang, Proc. of SPIE Vol. 11565, 1156501 · © 2020 SPIE · CCC code: 0277-786X/20/\$21 · doi: 10.1117/12.2586004

Proc. of SPIE Vol. 11565 1156501-1

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 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 AOPC 2020: Display Technology; Photonic MEMS, THz MEMS, and Metamaterials; and Al in Optics and Photonics, edited by Z. Y. Xu, Y. T. Wang, Q. H. Wang, L. C. Cao, H. K. Xie, C. K. Lee, Y. H. Wang, B. Yang, H. B. Luo, J. Cheng, L. Fang, Proceedings of SPIE Vol. 11565 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

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

ISBN: 9781510639515 ISBN: 9781510639522 (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.



**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

## DISPLAY TECHNOLOGY; PHOTONIC MEMS, THZ MEMS, AND METAMATERIALS; AND AI IN OPTICS AND PHOTONICS

11565 02 Parallax enhancement 3D integral imaging display from the commercial Lytro standard **camera** [11565-1] 11565 03 Research on technology of panoramic projection [11565-2] 11565 04 Study on projection screen and speckle contrast in laser display technology [11565-3] 11565 05 Effective speckle reduction method based on a rotating ball lens [11565-4] 11565 06 Retinal projection display system based on MEMS scanning projector and conicoid curved semi-reflective mirror [11565-5] 11565 07 Design of an off-axis four-mirror system for automotive head-up display [11565-6] 11565 08 Design of a zoom projection optical system for high resolution projector [11565-7] 11565 09 A multiview autostereoscopic display system using holographic projection [11565-8] 11565 OA Poly-capillary x-ray collimating lens composed with channels of different diameters for medical imaging [11565-9] 11565 OB Quantitative analysis of effect of tilted misalignment on image quality in integral imaging system [11565-10] Research on radiation damage of fiber optical fiber ring for fiber optic gyroscope [11565-11] 11565 OC 11565 OD Influence analysis of magnetic field coil on interior electric field of bounded-wave simulator based on circuit model [11565-21] 11565 OE Research on industrial robot reducer state monitoring cloud platform [11565-22] 11565 OF Simulation analysis of radiation field characteristic of low frequency wide pulse electric field simulator using in the chamber [11565-23] 11565 0G Attenuation characteristics experiment research of low frequency pulse magnetic field penetrating through reinforcement nets [11565-24] 11565 OH Research on construction method of electromagnetic scene suitable for intelligent connected **vehicle** [11565-25]

11565 01	Inductively coupled plasma (ICP) dry etching of type II InAs/GaSb superlattice for focal plane arrays [11565-26]
11565 OJ	Failure mechanism of integrated circuits investigated experimentally and theoretically under electrical fast transient [11565-27]
11565 OK	Depth image based on rehabilitation human behavior recognition [11565-28]
11565 OL	Dual-tunable metamaterial absorber based on solid ion gel-graphene sandwich structure [11565-29]
11565 OM	Prediction method of equipment maintenance time based on deep learning [11565-32]
11565 ON	GPU parallel implementation of improved noise adaptive principal component algorithm for feature extraction of hyperspectral images [11565-33]
11565 OO	Design of a built-in baffle for a Ritchey-Chretien optical system [11565-34]
11565 OP	Deep learning approach for nonlinear structured illumination microscopy [11565-35]
11565 0Q	Hyperspectral image open set recognition based on the extreme value machine [11565-36]
11565 OR	Monocular recognition measurement method based on the geometric model of the drogue [11565-37]
11565 OS	Study on knowledge discovery algorithm of automatic control system combined with optical sensor [11565-38]
11565 OT	Remote sensing object detection based on YOLO and embedded systems [11565-39]
11565 OU	Transparent electromagnetic shielding film based on additive electrohydrodynamic jet printing technology [11565-210]
11565 OV	Data augmentation method of remote sensing image based on transfer learning and VGG model [11565-310]
11565 OW	A novel bottom-up keypoints based hexagon bolts detection method [11565-311]
11565 OX	Fiber bundle image restoration using conditional generative adversarial network [11565-312]
11565 OY	An auxiliary intelligent identification system for contraband of x-ray machine [11565-313]
11565 OZ	Color-guided depth map super resolution using joint convolutional neural network [11565-314]
11565 10	Learning-based short-coherence digital holographic imaging through scattering media [11565-315]
11565 11	Space-time adaptive super resolution imaging [11565-316]

- 11565 12 CT local reconstruction method based on truncated data extrapolation network [11565-317]
- 11565 13 Low dose x-ray CT image denoising via U-net in projection domain [11565-319]
- 11565 14 A manufacture-friendly design framework for optical neural networks [11565-320]