PROCEEDINGS OF SPIE

Digital Optics for Immersive Displays II

Bernard C. Kress
Christophe Peroz
Editors

6–10 April 2020
Online Only, France

Sponsored by
SPIE

Cosponsored by
City of Strasbourg (France)
Eurometropole (France)
CNRS (France)
iCube (France)
Université de Strasbourg (France)

Cooperating Organisations
Photonics 21 (Germany)
EOS—European Optical Society (Germany)
Photonics Public Private Partnership (Belgium)
Photonics France (France)

Published by
SPIE

Volume 11350

Proceedings of SPIE 0277-786X, V. 11350

Digital Optics for Immersive Displays II, edited by Bernard C. Kress, Christophe Peroz, Proc. of SPIE
Vol. 11350, 1135001 · © 2020 SPIE · CCC code: 0277-786X/20/$21 · doi: 10.1117/12.2571790

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 *Digital Optics for Immersive Displays II*, edited by Bernard C. Kress, Christophe Peroz, Proceedings of SPIE Vol. 11350 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

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

ISBN: 9781510634725
ISBN: 9781510634732 (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

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
SPIEDigitalLibrary.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

Authors

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Conference Committee

Symposium Chairs

Francis Berghmans, Vrije Universiteit Brussel (Belgium)
Thierry Georges, Oxxius SA (France)
Paul Montgomery, Université de Strasbourg (France)
Lluis Torner, ICFO Barcelona (Spain)

Conference Chairs

Bernard C. Kress, Microsoft Corporation (United States)
Christophe Peroz, Magic Leap, Inc. (United States)

Conference Programme Committee

Tibor Balogh, Holografika Kft. (Hungary)
Christian Bosshard, Centre Suisse d' Electronique et de Microtechnique SA (Switzerland)
Federico Capasso, Harvard School of Engineering and Applied Sciences (United States)
Dan Curticapean, Hochschule Offenburg (Germany)
Arie den Boef, ASML Netherlands B.V. (Netherlands)
Andreas Hermerschmidt, HOLOEYE Photonics AG (Germany)
Hong Hua, James C. Wyant College of Optical Sciences (United States)
Norbert Kerwien, Carl Zeiss AG (Germany)
Stan Larroque
Byoungho Lee, Seoul National University (Korea, Republic of)
Scott McEldowney, Oculus VR, LLC (United States)
Darran Milne
Juan C. Miñano, Limbak 4PI S.L. (Spain)
Ilmars Osmanis, Lightspace Technologies, SIA (Latvia)
Silvania F. Pereira, Technische Universiteit Delft (Netherlands)
Pascal Picart, Le Mans Université (France)
Demetri Psaltis, Ecole Polytechnique Fédérale de Lausanne (Switzerland)
Monika Ritsch-Marte, Medizinische Universität Innsbruck (Austria)
Peter Schelkens, Vrije Universiteit Brussel (Belgium)
Robert Stevens, Adlens Ltd (United Kingdom)
Hagen Stolle, SeeReal Technologies GmbH (Germany)
Hugo Thienpont, Vrije Universiteit Brussel (Belgium)
Reinhard Voelkel, SUSS MicroOptics SA (Switzerland)

Session Chairs

1 Digital Optics for AR and VR Systems
Bernard C. Kress, Microsoft Corporation (United States)

2 Digital Optics Fabrication and Testing for Immersive Displays
Christophe Peroz, Magic Leap, Inc. (United States)

3 Digital Optics for 3D Imaging and 3D Display
Maria Pace, Microsoft Corporation (United States)