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

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 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 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 \$18.00 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/\$18.00.

Printed in the United States of America Vm7 i ffUb 5ggc WUHY gz & Wzi bXYf"]Wy bgY Zfca GD-9.

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

v vii	Authors Conference Committee
SESSION 1	DIGITAL OPTICS FOR AR AND VR SYSTEMS
11350 02	Effects of polarisation and spatial coherence in the pupil expansion with crossed gratings in an AR display [11350-1]
11350 04	Double-pass HOE operation for compact AR glasses design [11350-4]
11350 05	Wide-field-of-view augmented reality eyeglasses using curved wedge waveguide [11350-5]
SESSION 2	DIGITAL OPTICS FABRICATION AND TESTING FOR IMMERSIVE DISPLAYS
11350 06	Curved microdisplay, from optical design to mechanical study: impact on form-factor and light efficiency in visual systems (Invited Paper) [11350-6]
11350 08	Evaluation of augmented reality (AR) displays performance based on human visual perception [11350-8]
SESSION 3	DIGITAL OPTICS FOR 3D IMAGING AND 3D DISPLAY
11350 0A	XSlit cameras for free navigation with depth image-based rendering [11350-10]
11350 OC	EEG based assessment of user performance for a volumetric multiplanar display [11350-13]
	11350 ADDITIONAL PRESENTATIONS
11350 OF	
11330 UL	Wide field of view HOE-based waveguides system for AR display [11350-14]