# PROCEEDINGS OF SPIE

# Dimensional Optical Metrology and Inspection for Practical Applications XIV

Kevin G. Harding Song Zhang Jae-Sang Hyun Beiwen Li Andrés G. Marrugo Editors

16–17 April 2025 Orlando, Florida, United States

Sponsored and Published by SPIE

**Volume 13462** 

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 *Dimensional Optical Metrology and Inspection for Practical Applications XIV*, edited by Kevin G. Harding, Song Zhang, Jae-Sang Hyun, Beiwen Li, Andrés G. Marrugo, Proc. of SPIE 13462, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510687134

ISBN: 9781510687141 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2025 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.



**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 Conference Committee

	METROLOGY CALIBRATION AND ANALYSIS
13462 03	Single-shot 3D surface reconstruction with dual frequency composite pattern and multiview system [13462-2]
13462 04	Enhanced absolute phase unwrapping method for multiview structured-light system using deep learning [13462-3]
13462 05	Freeform surface metrology using calibrated multispot shear-interferometry [13462-6]
	METROLOGY APPLICATIONS I
13462 06	Using far field diffraction for roller gap setting [13462-7]
13462 07	Reflection-based active alignment for off-axis optical systems with powered mirrors [13462-8]
	METROLOGY APPLICATIONS II
13462 09	Tree height measurement with smartphone embedded sensors [13462-12]
13462 0A	Characterization of window materials using out-of-plane BSDF measurements, combining resolution of small-angle scattering and low level background scattering [13462-14]
13462 OB	Investigating the factors that influence 3D stereo depth sensor noise [13462-15]
	NEW METROLOGY METHODS
13462 OC	A phase-shift triangulation gage [13462-16]
13462 0D	A mapping autocollimator using phase measurement [13462-17]
13462 OE	Line-scan hyperspectral 4D imaging across visible to shortwave infrared spectral range [13462-18]
13462 OF	High-resolution tactile sensor for 3D surface measurement using structured light system [13462-19]

### **POSTER SESSION**

13462 OG **3-dimensional plenoptic microscopy using a stacked microlens array** [13462-20]