PROCEEDINGS OF SPIE

Third Advanced Imaging and Information Processing Conference (AIIP 2025)

Xinzhu Sang

Editor

22–26 July 2025 Xinjiang, China

Organized by
Chinese Laser Press (China)
China Optical Society Holographic and Optical Information Processing Committee (China)

Sponsored by
Kashi University (China)
Xinjiang Technical Institute of Physics and Chemistry, CAS (China)

Technical Co-Sponsor and Publisher SPIE

Volume 13817

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 *Third Advanced Imaging and Information Processing Conference (AIIP 2025)*, edited by Xinzhu Sang, Proc. of SPIE 13817, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510695320

ISBN: 9781510695337 (electronic)

Published by

SPIF

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

THIRD ADVANCED IMAGING AND INFORMATION PROCESSING CONFERENCE (AIIP 2025)

	THIRD ADVANCED IMAGING AND INFORMATION PROCESSING CONFERENCE (AIIP 2025)
13817 02	Analysis and comparison of state-of-the-art methods in image super-resolution reconstruction [13817-2]
13817 03	Research on image feature extraction method based on principal component analysis [13817-5]
13817 04	Deep-learning-based single-image super-resolution in practice [13817-6]
13817 05	A single-pixel imaging method for multimode fibers with low sampling rates [13817-8]
13817 06	Broadband wide-field optical edge detection imaging enabled by helical metalens [13817-9]
13817 07	Multi-parameter sensor based on femtosecond laser pulses inscribed EFBG [13817-16]
13817 08	OIRD: a multi-scenario dataset for intelligent laser interference image restoration [13817-18]
13817 09	Robust single-shot fringe analysis via deep learning for extended depth [13817-26]
13817 0A	Research on the computational imaging method of full-visible-spectrum achromatic diffractive lens based on improved enumeration search algorithm [13817-27]
13817 OB	Space debris detection and positioning method based on star map recognition [13817-30]
13817 OC	Effect of driving electric field parameters on the output of nematic liquid crystal cell [13817-32]
13817 OD	A femtosecond optical frequency comb for space-ground time and frequency comparison links [13817-33]
13817 OE	Single-photon depth super-resolution 3D imaging [13817-39]
1381 <i>7</i> 0F	Analyses of the influences of camera parameters of relay-projection microscopic telescopy [13817-41]
13817 0G	Stability study of full polarization maintaining electro-optical frequency comb system based on chirped fiber Bragg grating [13817-42]

- 13817 0H Proximity lithography simulation: from shadow printing to holographic lithography [13817-48]
- Design and simulation-based optimization of an ion optical focusing structure for a chipscale time-of-flight mass spectrometer [13817-49]