PROCEEDINGS OF SPIE

2024 International Conference on Photonics Solutions (ICPS2024)

Apichai Bhatranand
Editor

9–11 December 2024
Bangkok, Thailand

Organized by
Electrical Engineering Academic Association (Thailand)
King Mongkut's University of Technology Thonburi (Thailand)

Sponsored by
Electrical Engineering Academic Association (Thailand)
King Mongkut's University of Technology Thonburi (Thailand)
Optical Society of Japan (Japan)
Thailand Optics and Photonics Society (Thailand)
IEEE Thailand Chapter Photonics Society (Thailand)
Optica Thailand Chapter (Thailand)
Furukawa FITEL (Thailand)
Yokokawa (Thailand)
Fuyuan Communication Technology (Thailand)
Digital Instrument (Thailand)
AML Technology (Thailand)
CADFEM (Thailand)
F. E. S. (Thailand)
OptoSigma (Singapore)

Published by
SPIE

Volume 13518

Proceedings of SPIE 0277-786X, V. 13518

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 *2024 International Conference on Photonics Solutions (ICPS2024)*, edited by Apichai Bhatranand, Proc. of SPIE 13518, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510688292
ISBN: 9781510688308 (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.

SPIE. DIGITAL LIBRARY
SPIEDigitalLibrary.org

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

vii *Conference Committee*

INTERNATIONAL CONFERENCE ON PHOTONICS SOLUTIONS

13518 02 **Parallel phase-shifting digital holography for 3D recording of dynamic object (Invited Paper)** [13518-1]

13518 03 **Plasmonic effect-based dual-core PCF sensor for refractive index sensing** [13518-2]

13518 04 **Optical solutions based on computational frameworks (Invited Paper)** [13518-3]

13518 05 **Development of 3D-printed THz metasurfaces with digital light processing technique** [13518-4]

13518 06 **Optical sensing architecture for classifying glutinous, non-glutinous, and red-shell rice seeds** [13518-5]

13518 07 **Multiple optical knotting with multi-foci metalens** [13518-6]

13518 08 **Wide-band multispectral imaging system for classification of durian maturity** [13518-7]

13518 09 **Enhancing optical transmission link for O-RAN fronthaul with PAM-4 using FFE/DFE compensation** [13518-8]

13518 0A **SVM machine learning model for bandgap estimation of doped TiO_2 for numerical modelling of perovskite solar cell applications** [13518-9]

13518 0B **Characteristic of single Cooper pair transistor used as sensitive supercurrent sensor** [13518-10]

13518 0C **Development of optical alignment digital twin and its deployment to semiconductor laser optical sub-assembly** [13518-11]

13518 0D **Angle-polished fiber assembled to grating coupler of silicon photonics** [13518-12]

13518 0E **Intrinsic property-based soft biometric classification using wavelet CNNs and LRP** [13518-13]

13518 0F **Amplitude stabilization of frequency-tunable biquad digital oscillator using zero-input response analysis** [13518-14]

13518 0G **High offset tolerance fiber to waveguide coupling solution for 3D printed coupling device** [13518-15]

13518 0H **Interferometric vibration measurement of electromechanical devices using vision technique** [13518-16]

13518 0I **Machine learning-based fingerprint pattern recognition with Mach-Zehnder interferometer** [13518-17]

13518 0J **Embedded hardware implementation of noise gate on STM32 processor using MATLAB/Simulink** [13518-18]

13518 0K **Quantitative refractive index analysis of thermal and non-thermal curing of polymeric holographic material** [13518-19]

13518 0L **Generalized frequency division multiplexing decoders under imperfect channel estimation** [13518-20]

13518 0M **Validation of perfectly rotating polarized light using Sagnac interferometry: a comparison of Python simulations and machine learning technique** [13518-21]

13518 0N **Correcting instrument shifts in solar spectroscopy with telluric lines: a study with an in-house Fourier transform spectrograph** [13518-22]

13518 0O **Visualization of sound propagating in multiple directions in a single recording using digital holography** [13518-23]

13518 0P **Pulse wave measurement system by rPPG from human and animal soles (Invited Paper)** [13518-24]

13518 0Q **Application-optimized FPGAs design using RTL-designed FPGAs architectures** [13518-25]

13518 0R **Attenuation error of variable optical attenuator at NIMT** [13518-26]

13518 0S **Laser calorimeter as a laser power standard for low power calibration systems at NIMT** [13518-27]

13518 0T **Enhancing noise suppression and signal detection in Fourier transform spectrograph using lock-in amplifier** [13518-28]

13518 0U **CAD development and routing analysis for RTL-designed FPGAs** [13518-29]

13518 0V **Event-related potential reveals partial face cognitive mechanisms through machine learning** [13518-30]

13518 0W **Investigation variable star classification through light curve analysis using machine learning approach** [13518-31]

13518 0X **Characterization of refractive index of polydimethylsiloxane and titanium dioxide particles composite for tissue phantom application in 0.2–0.5 THz range** [13518-32]

13518 0Y **Differences in the electronic and optical properties between hexagonal boron nitride monolayer and carbon-doped hexagonal boron nitride monolayer: a DFT study** [13518-33]

13518 0Z **3D fluorescence imaging through scattering medium and bioapplications (Invited Paper)** [13518-34]

13518 10 **Development of crispness measurement system based on fiber optic sensor** [13518-35]