PROCEEDINGS OF SPIE

Seventh Global Intelligent Industry Conference (GIIC 2024)

Xingjun Wang *Editor*

30 March – 1April 2024 Shenzhen, China

Organized by Peng Cheng Laboratory (China)

Sponsored by The Chinese Society for Optical Engineering (China)

Published by SPIE

Volume 13278

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 Seventh Global Intelligent Industry Conference (GIIC 2024), edited by Xingjun Wang, Proc. of SPIE 13278, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510682986

ISBN: 9781510682993 (electronic)

Published by

SPIE

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

SPIE.ora

Copyright © 2024 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

vii Conference Committee

SEVENTH GLOBAL INTELLIGENT INDUSTRY CONFERENCE (GIIC 2024)

	,
13278 02	Optimization method of scanning strategy for reactive ion beam etching of large aperture grating elements [13278-1]
13278 03	Theory and method of pulsed ion beam single crystal silicon reshaping based on controllable time-varying removal function [13278-2]
13278 04	Data generation for nighttime infrared scenes using enhanced domain migration learning [13278-3]
13278 05	Design of double-layer MoSi superconducting microstrip single-photon detector with a high-light absorption [13278-4]
13278 06	Beam shaping of photon spin Hall effect based on single-layer dielectric metasurface [13278-6]
13278 07	Structural and epsilon-near-zero characteristics of titanium carbide films with different carbon content [13278-7]
13278 08	Research on vector optimization of laser beam splitter grating [13278-8]
13278 09	Numerical investigation of the spectral transmission characteristics of T-shaped metal nanohole array [13278-9]
13278 0A	Simulation and analysis of wavelength-tunability dispersion compensating concentric core photonic crystal fiber with low-confinement loss [13278-10]
13278 OB	Fast convergence of shapes using atmospheric inductively coupled plasma [13278-13]
13278 0D	Design of achromatic metalens based on dielectric metasurface [13278-18]
13278 OE	A lightweight reconfigurable hardware accelerator for depthwise separable convolution [13278-20]
13278 OF	An intelligent classification method for remote sensing images based on hyperspectral imaging technology [13278-22]
13278 0G	Aerosol extinction hygroscopic growth proxy based on visibility in Hefei during the winter [13278-23]

13278 0H	MTF compensation of baseline adjustable optical sparse aperture imaging system [13278-26]
13278 01	Advanced equalization technology with pulse amplitude modulation (PAM) in short reach direct-detection optical link [13278-27]
13278 OJ	Omni-digital reconfigurable intelligent surfaces enhanced visible light communications [13278-35]
13278 OK	Anomaly detection of EMU trains based on line-scan image registration [13278-37]
13278 OL	Hardware-efficient integration of communication and vibration sensing in DSCM system using commercial 100 kHz ECL [13278-38]
13278 OM	Photonics millimeter-wave joint radar-communication signal generation based on frequency permutations [13278-39]
13278 ON	Adversarial patch attacks multispectral aerial object detectors system [13278-42]
13278 00	Application of floating imaging and interaction in safety accident simulation [13278-43]
13278 OP	Sequences pattern effects on the time and space united coding single photon counting imaging method $[13278-44]$
13278 OQ	Efficient light management of ultra-thin perovskite silicon tandem cells based on plasmonic nanoring [13278-48]
13278 OR	Monte Carlo simulation of sphere-cylinder scattering medium for double Stokes-Mueller polarimetry [13278-51]
13278 OS	Optical short-time Fourier transformation based on a bidirectional CFBG [13278-53]
13278 OT	On-chip reconfigurable mode converter by rectangle Sb ₂ S ₃ inlaid in 4H-SiC [13278-54]
13278 OU	Study on the intelligent valuation technique of step height standards based on atomic force microscopy [13278-55]
13278 0V	Dataset augmentation method for milling tool breakage monitoring based on auxiliary classifier generative adversarial networks [13278-62]
13278 OW	Liquid-core long-period grating temperature sensor based on femtosecond writing [13278-63]
13278 0X	Optical processing strategies for microimaging small-aperture Wolter mirrors [13278-69]
13278 OY	Adaptive wavefront interferometry for large surface figure error utilizing convolutional neural networks [13278-70]

13278 OZ	Detecting adversarial examples via an orthogonal knowledge-distillation-based approach [13278-76]
13278 10	Pre-trained transformer for photonic compressive sampling [13278-80]
13278 11	Optical design and spectral calibration of a laser scanning confocal microscopy spectral imaging system based on filters [13278-11]
13278 12	A 10-b 500KS/s low-power SAR ADC for smart sensing in 40nm CMOS [13278-19]
13278 13	Efficient perovskite solar cells based on self-assembled monolayers as hole transport layer [13278-25]
13278 14	Advanced modulation formats, method, and equalization schemes in optical short to medium reach link $[13278-28]$
13278 15	Multispectral photoacoustic imaging for detection of ischemia in skeletal muscle [13278-29]
13278 16	A physical guided data-driven tool condition monitoring model for high-speed vertical milling of carbon fiber reinforced polymer [13278-30]
13278 17	Computational imaging of moving hidden objects through random scattering layers by speckle cross-correlation method [13278-32]
13278 18	Stable wavelength tunable photoacoustic imaging platform [13278-33]
13278 19	Laser beam homogenization and shaping with metasurfaces [13278-34]
13278 1A	Knowledge graph error detection with unsupervised triplet network [13278-36]
13278 1B	Fiber Bragg grating sensing multiplexing based on LP_{01} and LP_{11} spatial mode diversity $[13278\text{-}40]$
13278 1C	Analysis and investigation of photon coordinate system transformation invariants in backscattering Mueller matrix computational polarimetry [13278-45]
13278 1D	Optical path design facing θ/θ reflectance measurement of test targets for autonomous vehicles [13278-46]
13278 1E	A survey of physical-domain adversarial attack methods against object detection models [13278-47]
13278 1F	Characterization of microlenses by transport of intensity equation [13278-50]
13278 1G	Research of underwater 3D imaging based on single-slit streak tube imaging lidar [13278-52]

13278 1H	Design of optical system for space-based space debris detection [13278-56]
13278 11	Imaging of objects submerged in random media [13278-57]
13278 1J	A threshold-based and neural network approach for multi-tooth milling cutter tool breakage monitoring [13278-61]
13278 1K	Curvature and temperature sensing based on liquid-core fiber Bragg grating [13278-67]
13278 1L	A simple method for demodulation of long-period fiber grating signals [13278-68]
13278 1M	Curved CGH design techniques for aligning reflective optical system [13278-72]
13278 1N	Optical adaptive multi-path wideband self-interference cancellation system based on the particle swarm optimization [13278-75]
13278 10	Simulation and analysis of far-field single-photon response model in Geiger avalanche mode [13278-79]