

PROCEEDINGS OF SPIE

Sixth International Conference on Digital Signal and Computer Communications (DSCC 2026)

**Zoran Bojkovic
Gordana Jovanovic Dolecek**
Editors

**10–12 April 2026
Kunming, China**

Organized by
Kunming University of Science and Technology (China)

Sponsored by
AEIC—Academic Exchange Information Centre (China)

Published by
SPIE

Volume 14294

Proceedings of SPIE 0277-786X, V. 14294

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 SPIDigitalLibrary.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 *Sixth International Conference on Digital Signal and Computer Communications (DSCC 2026)*, edited by Zoran Bojkovic, Gordana Jovanovic Dolecek, Proc. of SPIE 14294, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9798902326861

ISBN: 9798902326878 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2026 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**

SPIDigitalLibrary.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

ix *Conference Committee*

SIGNAL PROCESSING AND COMMUNICATION TECHNOLOGIES

- 14294 02 **Teleportation with dense coding** [14294-41]
- 14294 03 **Outage probability of the UAV-based RF-THz network** [14294-24]
- 14294 04 **A precise electrical control method for cigarette weight in cigarette machines based on adaptive correction Smith algorithm** [14294-75]
- 14294 05 **A nonlinear trajectory tracking method for AGV robot inspection based on the Kalman filter algorithm** [14294-72]
- 14294 06 **Method of seismic signal denoising and decomposition based on DeepDenoiser deep neural network** [14294-78]
- 14294 07 **A two-stage coarse-to-fine robust localization scheme for 3D target nodes in underwater acoustic IoT networks** [14294-59]
- 14294 08 **Absorption-loss-aware localization algorithm for underwater wireless sensor networks** [14294-69]
- 14294 09 **Moss growth optimization-driven online parameter calibration method for wind farm digital twins** [14294-21]
- 14294 0A **A rigorous investigation of wavelet transform methodologies for signal denoising in submarine tunnel structural health monitoring systems** [14294-81]
- 14294 0B **Improved octopus optimization algorithm based on multistrategy fusion** [14294-68]
- 14294 0C **Comparative analysis of rotational and translational signals generated by high-speed rail** [14294-3]
- 14294 0D **Effectiveness evaluation of air-ground cooperative radar countermeasure reconnaissance system architecture based on complex network theory** [14294-23]
- 14294 0E **Joint power and channel resource allocation in NOMA-based 5G/6G wireless networks** [14294-31]
- 14294 0F **Research on satellite attitude prediction based on LSTM-attention mechanism** [14294-30]
- 14294 0G **Resource optimization for cooperative sensing tasks in V2X ISCC systems based on attention-DRL** [14294-4]

- 14294 OH **Design and performance optimization of a dual-band Doherty power amplifier using Schottky diode rectification** [14294-76]
- 14294 OI **An integrated framework for submarine pipeline routing suitability evaluation with underwater scene-assisted seabed interpretation** [14294-5]
- 14294 OJ **Bit error rate characteristics of a free-space optical system under the combined effects of aperture, wavelength, and turbulence intensity** [14294-82]
- 14294 OK **A digital twin-driven framework for full lifecycle operation and maintenance of smart production lines** [14294-28]
- 14294 OL **A review of the technological development and performance of optical fiber communication transmission media** [14294-19]
- 14294 OM **A study on deep reinforcement learning algorithms for inter-satellite communication link scheduling in low-Earth orbit** [14294-70]
- 14294 ON **Research on UAV self-organizing network coverage optimization based on an improved Hippo algorithm** [14294-10]
- 14294 OO **Joint optimization of 3D deployment and power allocation for multi-UAV base stations** [14294-32]
- 14294 OP **Task allocation and joint resource optimization for multi-UAV integrated sensing and communication based on the MDP-PPO algorithm** [14294-42]
- 14294 OQ **Graph reinforcement learning-enhanced joint optimization of user grouping, subcarrier allocation, and power allocation for MIMO-NOMA systems** [14294-15]

IMAGE PROCESSING AND PATTERN RECOGNITION

- 14294 OR **Frequency-aware dynamic channel splitting and heterogeneous quantization for data-free vision transformers** [14294-20]
- 14294 OS **A robot localization method based on fusion between 2D laser planes and double fisheye cameras** [14294-33]
- 14294 OT **CAGFusion: infrared-visible image fusion based on a cross-axial gating architecture and a differential complementarity mechanism** [14294-6]
- 14294 OU **Dual-constrained semi-supervised concept factorization for multiview clustering** [14294-58]
- 14294 OV **An efficient OAM recognition method via graph convolutional network and MELM** [14294-14]
- 14294 OW **CL-RTDETR: an improved RT-DETR-based small object detection algorithm for UAV remote sensing imagery** [14294-52]

- 14294 0X **Infrared multi-UAV detection via multiscale residual context and high-resolution feature pyramid** [14294-53]
- 14294 0Y **LC-YOLO: long-tailed infrared UAV detection based on local contrast** [14294-45]
- 14294 0Z **QDP-YOLOv5: enhanced HIC-YOLOv5 architecture for detecting small objects** [14294-80]
- 14294 10 **A method of feature selection and weighting scheme based on text set density** [14294-61]
- 14294 11 **AI detection method for multiple anomalies inside gearboxes based on improved convolutional neural networks** [14294-73]
- 14294 12 **Research on text restoration technology of cultural relics rubbing based on image processing** [14294-26]
- 14294 13 **Deep learning-based detection technology for railway track surface defects** [14294-22]
- 14294 14 **Learning discriminative features from enhanced images for cross-frame object tracking in tactical combat scenarios** [14294-27]
- 14294 15 **RSEA-YOLO: a lightweight improved YOLO model for remote sensing scenes** [14294-7]
- 14294 16 **A third-party behavior recognition method for oil and gas pipelines based on soft sparse shape learning** [14294-62]
- 14294 17 **Lightweight deep learning model for efficient diabetic retinopathy screening** [14294-36]
- 14294 18 **A lightweight detection method for defects of transmission line insulators and accessories based on improved YOLOv11n** [14294-12]
- 14294 19 **Improved YOLOv11 for transmission line foreign object detection based on multibranch feature fusion and hybrid attention** [14294-16]
- 14294 1A **Adversarial and focal loss optimized joint extraction for marine diesel engine faults** [14294-18]
- 14294 1B **Improved YOLOv13 based on MVit and RepLKNet fusion for substation meter defect detection** [14294-44]
- 14294 1C **A lightweight and high-precision road defect detection method based on improved YOLO11** [14294-13]
- 14294 1D **CMFNet: RGB-T semantic segmentation with complementary enhancement and bidirectional interactive fusion** [14294-46]
- 14294 1E **Foggy vehicle detection with a multibranch attentive feature refinement module** [14294-48]

- 14294 1F **FSC-Net: frequency-spatial synergetic dual-branch network for remote sensing object detection in complex aerial scenarios** [14294-50]
- 14294 1G **TAMsNet: a target-adaptive multiscale detection network for fine-grained ship recognition in remote sensing images** [14294-47]
- 14294 1H **MoESparseSegNet: anatomy-pathology-aware mixture of experts with sparse attention for meibomian gland segmentation in dry eye disease** [14294-9]
- 14294 1I **From understanding to rendering: multimodal LLM-guided green retrofitting of urban street views** [14294-79]

NETWORK SECURITY AND INTELLIGENT SYSTEMS

- 14294 1J **Semantic segmentation-guided adaptive digital watermarking for face images** [14294-17]
- 14294 1K **Short-term prediction and co-evolutionary genetic algorithm for dynamic bus scheduling** [14294-8]
- 14294 1L **A secure storage method for massive network cloud data based on CP-ABE algorithm** [14294-71]
- 14294 1M **Cooperative perception at urban signalized intersections: challenges, paradigms, and operational implications** [14294-11]
- 14294 1N **Risk-aware dynamic sharding via multilabel propagation and LSTM prediction** [14294-25]
- 14294 1O **Research on confidentiality method of computer information systems based on DES algorithm** [14294-77]
- 14294 1P **Simulation experiment research on data security encryption method for computer information system based on ABE algorithm** [14294-63]
- 14294 1Q **Pilot-aided codebook-based non-orthogonal artificial noise for secrecy capacity enhancement** [14294-39]
- 14294 1R **Power allocation for non-orthogonal artificial noise in small-scale MIMO secure communication systems** [14294-34]
- 14294 1S **A lightweight and trustworthy authentication protocol for industrial IoT using channel-assisted hyperelliptic-curve cryptography** [14294-35]
- 14294 1T **Secrecy capacity optimization in MIMO systems via optimal power allocation and artificial noise** [14294-49]
- 14294 1U **Enhancing IIoT data security with OTK-based non-orthogonal artificial noise** [14294-54]
- 14294 1V **Physical layer security of MIMO systems with SOC-AN under imperfect channel state information** [14294-55]

- 14294 1W **Enhancing physical layer security in MA-enabled MIMO systems via pilot-aided codebook-based artificial noise** [14294-56]
- 14294 1X **Secure MIMO communication via pilot-based codebook artificial noise under unknown eavesdropper channel conditions** [14294-40]
- 14294 1Y **Research on in-vehicle video cloud forensics security based on AIC-RDHEIV algorithm** [14294-57]