

PROCEEDINGS OF SPIE

***Fifth International Conference on  
Advanced Algorithms and Signal  
Image Processing (AASIP 2025)***

**Jianan Lin  
Yanglong Sun**  
*Editors*

**8–10 August 2025  
Xiamen, China**

*Organized by*  
Jimei University (China)

*Sponsored by*  
Xiamen University (China)  
Guizhou University (China)  
AEIC—Academic Exchange Information Centre (China)

*Published by*  
SPIE

**Volume 13967**

Proceedings of SPIE 0277-786X, V. 13967

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](http://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 *Fifth International Conference on Advanced Algorithms and Signal Image Processing (AASIP 2025)*, edited by Jianan Lin, Yanglong Sun, Proc. of SPIE 13967, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510698789

ISBN: 9781510698796 (electronic)

Published by

**SPIE**

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

Telephone +1 360 676 3290 (Pacific Time)

[SPIE.org](http://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](http://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](http://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*

---

## IMAGE ENHANCEMENT, RESTORATION AND FUSION

---

- 13967 02 **Low-light image enhancement based on a dual-branch architecture** [13967-83]
- 13967 03 **AnimeGAN++: enhancing photo-to-anime translation with optimized AnimeGAN** [13967-23]
- 13967 04 **Image denoising-based Mamba cross-level method for underwater object detection**  
[13967-25]
- 13967 05 **ResFuseGCN-SA: multilabel weather image recognition method combining spatial  
attention and multiaggregate graph convolution** [13967-72]
- 13967 06 **Research on multimodal large-scale cigarette image comparative learning** [13967-29]
- 13967 07 **Research on construction of image denoising algorithm based on transformer** [13967-61]
- 13967 08 **Terrain model representation for linear corridor project by geometry image** [13967-38]
- 13967 09 **Nondestructive identification of insulation weak points of electric energy meter based on  
image and leakage current feature TLS extraction algorithm** [13967-71]
- 13967 0A **Multimodal enhanced synthetic CT generation from brain MRI using 3D transformer  
denoising diffusion model** [13967-3]
- 13967 0B **3D point cloud reconstruction of cardiac ventricles from magnetic resonance imaging**  
[13967-5]
- 13967 0C **Characterization and compensation of NVG nonlinear response to NIR-LED displays in night  
vision flight simulation training** [13967-13]
- 13967 0D **LM-APD LiDAR image processing: adaptive restoration and tracking via local-global  
feature fusion** [13967-62]
- 13967 0E **Medical image fusion method based on Fourier-pulse neural collaborative feature  
decomposition** [13967-98]
- 13967 0F **Exploiting chaotic map and frequency-classified compression for multilevel image privacy  
protection** [13967-28]
- 13967 0G **Slope feature recognition technology based on AI image analysis technology** [13967-113]

- 13967 OH **Innovative design of trendy toy blind boxes based on stable diffusion and ControlNet** [13967-12]
- 13967 OI **The format conversion of human motion capture data** [13967-33]
- 13967 OJ **Early fault feature extraction method for RV reducers based on IAO-MNAD-BP** [13967-52]
- 13967 OK **Diffusion model-based medical image generation** [13967-86]
- 13967 OL **Research on silent facial anti-spoofing algorithm based on temporal information** [13967-63]
- 13967 OM **Application of UAV close-range photogrammetry technology in slope stability assessment during construction phase-highway rock slope, China** [13967-40]
- 13967 ON **Research on defect detection algorithm of welded joints in body-in-white based on improved YOLOv8** [13967-46]
- 13967 OO **Pose-assisted adaptive monocular depth estimation for safety distance assessment in welding scenes** [13967-66]
- 13967 OP **The improvement of DeepLabv3+ for steel strip surface defect segmentation** [13967-85]
- 13967 OQ **GELNO-FD: gauge-equivariant Fourier liquid neural operators for interpretable Markovian Bayesian dynamics** [13967-59]
- 13967 OR **A robust data hiding scheme combining Latin square permutation and QR code embedding for multiattack scenarios** [13967-18]
- 13967 OS **Automatic geometric and color correction of multiprojector** [13967-90]
- 13967 OT **GTDN: exploration on constructing graph-transformer dense network for underwater image enhancement** [13967-82]
- 13967 OU **HiDe-FogNet: a lightweight high-fidelity dehazing network with detail enhancement and color adjustment** [13967-11]
- 13967 OV **JND-based HEVC multiple description coding with information reuse** [13967-79]
- 13967 OW **Design of efficient data fusion algorithm for fiber Bragg grating sensor network** [13967-121]

---

#### OBJECT DETECTION, RECOGNITION AND SEGMENTATION

---

- 13967 OX **Research on similar image search algorithm** [13967-115]
- 13967 OY **Target detection algorithm of seed-slots based on YOLOv11** [13967-81]

- 13967 0Z **A study on the identification of pavement cracks based on improved Yolov8** [13967-96]
- 13967 10 **YOLOv5-enabled intelligent detection and B/S-based management system for highway pavement damages** [13967-99]
- 13967 11 **Hull plate weld defect detection algorithm based on YOLOv8n-PDB** [13967-45]
- 13967 12 **Multilevel classification of vision transformer images based on feature fusion** [13967-53]
- 13967 13 **Defect measurement technology based on skeleton extraction** [13967-64]
- 13967 14 **Tomato maturity classification based on federated neural architecture search in cloud-edge model** [13967-116]
- 13967 15 **DCB-YOLO: lightweight Uyghur text detection in natural scenes** [13967-58]
- 13967 16 **VS-RTDETR: an enhanced framework for Uyghur text detection in low-light** [13967-105]
- 13967 17 **Progressive dilated convolutional network with squeeze-and-excitation attention for epileptic seizure detection** [13967-65]
- 13967 18 **A lightweight framework for collaborative optimization of algorithms and neural networks in e-commerce image-text retrieval** [13967-68]
- 13967 19 **Automatic segmentation method of lake sediment sequence based on improved U-Net3D algorithm** [13967-36]
- 13967 1A **Research on multilabel image classification algorithm based on DenseNet and attention mechanism** [13967-110]
- 13967 1B **Geotechnical profile image recognition and lithology classification based on vision transformer** [13967-120]
- 13967 1C **A study of human body model registration based on improved non-rigid ICP algorithm** [13967-92]
- 13967 1D **Research on dual-spectrum image fusion and defect recognition based on deep learning** [13967-15]
- 13967 1E **IPL-CD-ViT: iterative pseudo-labeling for cross-domain few-shot object detection** [13967-88]
- 13967 1F **A class incremental learning method for ground and low altitude radar target classification** [13967-39]
- 13967 1G **Rolling bearing fault diagnosis method based on YOLOV8-EWA network** [13967-35]

- 13967 1H **PSD-YOLO: an optimized and improved UAV image small-target detection method based on YOLOv11** [13967-89]
- 13967 1I **YOLOv12-pig enhanced detection of pig behaviors with structural optimization** [13967-42]
- 13967 1J **A study on 3D tracking algorithm for highly maneuverable targets detected by radar** [13967-41]
- 13967 1K **Research on ginseng image recognition method based on improved YOLOv8 algorithm** [13967-109]
- 13967 1L **Dense pedestrian detection based on multibranch convolution and multiscale background suppression** [13967-51]
- 13967 1M **Multimodal forgery detection framework integrating frequency domain, facial landmarks and appearance** [13967-21]
- 13967 1N **Fine maturity grading of bananas based on yolov8-DBD** [13967-14]
- 13967 1O **Target detection and ring number recognition in shooting sports based on YOLOv11 algorithm** [13967-16]
- 13967 1P **A dense pedestrian detection network model based on multiscale feature fusion** [13967-80]
- 13967 1Q **An easy-to-deploy lightweight fruit detection algorithm with improved YOLOv8n** [13967-32]

---

#### SIGNAL PROCESSING, NAVIGATION AND INTELLIGENT SYSTEMS

- 13967 1R **A trustworthy 5G federated learning method based on contrastive loss function** [13967-74]
- 13967 1S **Construction of a resource allocation efficiency evaluation model based on the self-organizing map (SOM) neural network** [13967-108]
- 13967 1T **Intelligent compilation algorithm for new equipment commissioning plan based on knowledge rule reasoning** [13967-97]
- 13967 1U **Design of water meter remote monitoring and payment system based on Internet of Things** [13967-49]
- 13967 1V **Design of a three-axis visual gimbal for drones** [13967-94]
- 13967 1W **Group-theoretic modeling and residual alignment for PET/CT respiratory motion registration** [13967-10]
- 13967 1X **Research on the optimization of BP neural network PID control algorithm based on whale optimization algorithm** [13967-60]

- 13967 1Y **Classification and grading method for sensitive data in digital power grid based on hybrid feature ranking algorithm** [13967-93]
- 13967 1Z **TV-L1 model based on fractional power for ill-posed problem in planar array capacitance sensor imaging** [13967-47]
- 13967 20 **Thermal simulation design of magnetic core for a high-temperature and high-current integrated open-loop hall current sensor** [13967-75]
- 13967 21 **AdaTriDiff: a novel text-to-image diffusion model** [13967-57]
- 13967 22 **Research on improved variable step-size FxLMS algorithm based on sigmoid-tanh function** [13967-8]
- 13967 23 **Multimodal feature fusion for UAVs and birds classification** [13967-50]
- 13967 24 **Research on margin annotation detection in Chinese ancient books based on Star-YOLO** [13967-54]
- 13967 25 **Dynamic identification technology of abnormal production behavior based on fast POCS and power big data** [13967-30]
- 13967 26 **Research on in-vehicle integrated navigation algorithm based on improved zero-velocity detection** [13967-48]
- 13967 27 **Spatial position recognition method for co-existence of multiple readers in the same frequency band using FMCW radar** [13967-69]
- 13967 28 **Design of state space algorithm for rural development based on artificial intelligence** [13967-2]
- 13967 29 **Construction of spatiotemporal adaptive federated graph learning algorithm model based on AIOT** [13967-6]
- 13967 2A **Identification method of RSSI tag tilt state under near-field beamforming of RFID reader** [13967-70]
- 13967 2B **Control of refrigerant charge of unit air conditioner in salt-making workshop based on improved causal reasoning algorithm** [13967-26]
- 13967 2C **Research on dynamic fine-grained models and algorithms for task scheduling in container cloud platforms** [13967-55]
- 13967 2D **Human motion analysis for at-home rehabilitation based on WiFi posture perception** [13967-22]
- 13967 2E **Robust arctangent adaptive filtering via momentum adaptation** [13967-95]
- 13967 2F **Design and implementation of flatness compensation for wideband radar target simulator** [13967-117]

- 13967 2G **A digital map generation method based on Canny optimization and image segmentation**  
[13967-107]
- 13967 2H **Research and implementation of a multithreaded segment tree algorithm optimized by DFS order** [13967-44]
- 13967 2I **FPGA prototype verification system for calibration algorithm of optoelectronic computing chips** [13967-37]
- 13967 2J **SPN-MFE-a novel embedded detection system for sweet potato stem nematodes based on multimodal fusion** [13967-43]
- 13967 2K **DQN-based behavior tree modeling and simulation for laser counter-UAV systems**  
[13967-114]
- 13967 2L **Optimization design of wellbore trajectory based on multistrategy fusion particle swarm algorithm under Gauss-Cauchy mutation mechanism** [13967-106]