

PROCEEDINGS OF SPIE

International Symposium on Artificial Intelligence Innovations (IS-AII 2025)

Xin Xu
Weihua Ou
Editors

11–14 January 2025
Guiyang, China

Organized by
Guizhou Normal University (China)

Sponsored by
Guizhou Normal University (China)
Guizhou Institute of Technology (China)
Qiannan Normal University for Nationalities (China)
Changchun University of Science and Technology (China)
Guizhou Association of Artificial Intelligence (China)
Guizhou Automatic Association (China)

Published by
SPIE

Volume 13681

Proceedings of SPIE 0277-786X, V. 13681

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 *International Symposium on Artificial Intelligence Innovations (IS-AII 2025)*, edited by Xin Xu, Weihua Ou, Proc. of SPIE 13681, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510693081

ISBN: 9781510693098 (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**

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*

ARTIFICIAL INTELLIGENCE

- 13681 02 **Time series classification-based anomaly detection for train passage health monitoring**
[13681-1]
- 13681 03 **Few-shot cross-modal time series prediction by pretrained large time series model**
[13681-3]
- 13681 04 **An effective transformer-based model for semantic segmentation** [13681-4]
- 13681 05 **Graph-guided and deep feature fusion hashing for unsupervised cross-modal retrieval**
[13681-5]
- 13681 06 **Event knowledge enhanced network for weakly supervised phrase grounding** [13681-6]
- 13681 07 **Clustered federated learning based on fuzzy time series morphology** [13681-7]
- 13681 08 **Orthogonalization-guided sparse transformer for signal time series classification** [13681-8]
- 13681 09 **Research on large language model fusion medical knowledge graph question and answer system** [13681-9]
- 13681 0A **Deep-learning-based methods for font collection and image processing** [13681-10]
- 13681 0B **A collaborative filtering recommendation algorithm based on quantum SVD decomposition**
[13681-11]
- 13681 0C **Weakly supervised airport luggage segmentation method based on target priors** [13681-12]
- 13681 0D **Hybrid CNN-transformer attentive network for single image deraining** [13681-13]
- 13681 0E **Afcode LLM: large language model for code generation used for the AFSIM simulation platform** [13681-14]
- 13681 0F **Design and construction of a multimodal Chinese character knowledge graph for Chinese character reading and writing** [13681-15]
- 13681 0G **An automated function and type extraction method based on CodeBERT** [13681-16]

- 13681 OH **A feature-enhanced GCN approach for document-level relation extraction** [13681-17]
- 13681 OI **Unsupervised semantic segmentation using adversarial and self-supervised domain adaptation** [13681-18]
- 13681 OJ **Optimizing RAG systems with query intent analysis and hybrid retrieval strategies** [13681-21]
- 13681 OK **An open-world object detection model based on multiscale feature orthogonalization** [13681-22]
- 13681 OL **Research on the application of machine learning algorithms based on BP neural networks in the field of machine vision** [13681-23]
- 13681 OM **EDRN: an enhanced network for person re-identification under extreme illumination** [13681-24]
- 13681 ON **Handwritten digit recognition system based on improved LENET5** [13681-26]
- 13681 OO **Research and application of dialogue system based on ChatGLM3-6B** [13681-27]
- 13681 OP **An advanced deep learning framework for emotion recognition based on EEG signals** [13681-28]
- 13681 OQ **SST-LLM: time series forecasting based on large language models** [13681-29]
- 13681 OR **PatchDual: a study on medium- and long-term interval prediction of parking flow with temporal differential privacy** [13681-30]
- 13681 OS **Fault tolerance optimization of YOLOv5 for satellite-based target recognition** [13681-31]
- 13681 OT **A survey on SAM-based methods for medical image segmentation** [13681-32]
- 13681 OU **Research on self-training-based low-resource parallel sentence pair extraction** [13681-34]
- 13681 OV **Adversarial security for hyperspectral object detection** [13681-35]
- 13681 OW **Active evidence learning for named entity recognition with limited annotation resources** [13681-39]
- 13681 OX **Adaptive personalized federated learning for the power Internet of Things** [13681-40]
- 13681 OY **Unsupervised hyperspectral image classification with few samples based on multiview features clustering** [13681-41]
- 13681 OZ **The leader-follower consensus of conformable fractional-order multiagent systems with switched topology under a dynamic event-triggered mechanism** [13681-42]

- 13681 10 **Ensemble learning for glioma classification based on radiomics: a multimodal study** [13681-43]
- 13681 11 **A novel granular-ball streaming feature selection** [13681-45]
- 13681 12 **Neighborhood-aware adapter for vision-language models** [13681-47]
- 13681 13 **Research on data mining technology based on improved dual-chain quantum genetic algorithm** [13681-48]
- 13681 14 **A Fourier transform multiobjective genetic programming neural architecture search approach for image classification** [13681-49]
- 13681 15 **Multilevel feature mutual reconstruction network for fine-grained few-shot image classification** [13681-51]
- 13681 16 **A worse-case boosting algorithm-based intelligent cervical cancer cell image classification approach** [13681-52]
- 13681 17 **A granular-ball vague set model for classification** [13681-53]
- 13681 18 **Medical image fusion method based on relative total variation decomposition and deep convolutional neural networks** [13681-54]
- 13681 19 **Three-way granular-ball clustering based on density peaks** [13681-55]
- 13681 1A **RCD-DETR: a lightweight transformer-based model for object detection in high-resolution remote sensing images** [13681-57]
- 13681 1B **Real-time detection of small object for UAV based on YOLOv7 optimization** [13681-58]
- 13681 1C **Infrared small target detection algorithm based on symmetric fusion dual coding network** [13681-61]
- 13681 1D **Research on the food recognition technology of computer vision-based smart microwave oven** [13681-62]
- 13681 1E **Pothole detection and recognition based on the YOLOv5s model** [13681-63]
- 13681 1F **Epileptic EEG signal detection mode based on convolutional neural network and multiattention mechanism** [13681-64]
- 13681 1G **Image detection based on deep learning algorithms** [13681-65]
- 13681 1H **Optimizing wastewater treatment plant effluent quality prediction with different neural networks** [13681-66]

- 13681 1I **Goat object detection method based on deep learning** [13681-67]
- 13681 1J **Dual-attention metric network for few-shot fine-grained image classification** [13681-68]
- 13681 1K **Applications of concentration inequalities in machine learning algorithms under the background of data science** [13681-69]
- 13681 1L **Novel data-driven model based on capsule network for fault detection in chillers** [13681-71]
- 13681 1M **Mobile robot face mask detection in indoor public area** [13681-72]
- 13681 1N **Research on automatic confluence control strategy under reinforcement learning framework** [13681-73]
- 13681 1O **Improved top-looking animal pose estimation method with StarNet** [13681-74]
- 13681 1P **A multiobjective community detection algorithm based on node belonging degree migration** [13681-76]
- 13681 1Q **A universal approach for extracting interpretable neuro-symbols** [13681-78]
- 13681 1R **Open-world occluded object detection based on multilevel feature fusion and enhanced feature representation** [13681-79]
- 13681 1S **Dual attention-based cloud virtualization security using machine learning and big data** [13681-80]
- 13681 1T **Research on the anthropomorphic game testing method using artificial intelligence** [13681-81]
- 13681 1U **Design of a machine learning-based blood pressure prediction system** [13681-82]
- 13681 1V **Failure probability study of gas storage injection-production wells based on Monte-Carlo and BP neural networks** [13681-84]
- 13681 1W **Feature reconstruction module with enhanced selective kernel mechanism for few-shot image classification** [13681-86]
- 13681 1X **Channel-aware dual reconstruction for few-shot image classification** [13681-87]
- 13681 1Y **Research on generating highway lane change scenarios based on enhanced time-series networks** [13681-88]
- 13681 1Z **Ocean noise classification model based on multisource data fusion** [13681-89]
- 13681 20 **Instance and task-level improvements to DN4 for fine-grained few-shot image classification** [13681-90]

- 13681 21 **Cross-modal pedestrian detection algorithm based on attention feature fusion** [13681-96]
- 13681 22 **Three-dimensional multitarget detection of long-range, occluded targets** [13681-98]
- 13681 23 **MIAP: considering multi-interest for personalized music recommendation across multiple online platforms** [13681-99]
- 13681 24 **An assembly quality control system for the complex product using the knowledge-guided generative artificial intelligence** [13681-102]
- 13681 25 **Semantic segmentation algorithm for external mechanical damage to power transmission lines based on improved Swin-UNet network** [13681-103]
- 13681 26 **Lightweight apple leaf disease recognition model based on improved ShuffleNet V2** [13681-104]
- 13681 27 **Dynamic graph convolution with graph sparsification for power load forecasting** [13681-105]
- 13681 28 **Optimal scheduling of a multienergy microgrid using modified NSGA-II** [13681-107]
- 13681 29 **Real-time steel surface defect detection using RT-LSM-DETR** [13681-108]
- 13681 2A **Graph representation learning with multidimensional edges for prohibited item detection in x-ray images** [13681-110]
- 13681 2B **Multi-topology pattern routing for minimizing the number of vias by giving attribute quantities based on RMST** [13681-114]
- 13681 2C **Domain-adaptive few-shot histopathological image classification algorithm** [13681-116]
- 13681 2D **Research on data quality evaluation rules matching method based on improved Eclat algorithm** [13681-117]
- 13681 2E **A lightweight structure as C2f_GhostDynamic for YOLO algorithm** [13681-118]
- 13681 2F **A multimodal meme sentiment analysis method based on contrastive method with metaphorical information** [13681-120]
- 13681 2G **Clearsight: enhanced vision transformers for metal surface quality assurance** [13681-121]
- 13681 2H **A novel multivariate implicit relation mining method based on deep auto-encoder** [13681-122]
- 13681 2I **Detect multiple defects on bridge surfaces with improved YOLOv8** [13681-123]

- 13681 2J **Research on meme sentiment classification based on cross-modal feature fusion**
[13681-124]
- 13681 2K **Combinatorial multiarmed bandit: concave rewards and multidimensional arms**
[13681-125]
- 13681 2L **Region context enhanced hybrid convolutional and attention networks for fine-grained pest recognition** [13681-126]
- 13681 2M **Multiperson creation network based on GAN for text-to-image generation** [13681-127]