

PROCEEDINGS OF SPIE

Second International Conference on Informatics, Networking, and Computing (ICINC 2023)

**Yonghua Li
Hanbing Yao
Xing Liu**
Editors

**27–29 October 2023
Wuhan, China**

Organized by
Wuhan University of Technology (China)

Sponsored by
University of Evora (Portugal)
AEIC—Academic Exchange Information Centre (China)

Published by
SPIE

Volume 13078

Proceedings of SPIE 0277-786X, V. 13078

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 *Second International Conference on Informatics, Networking, and Computing (ICINC 2023)*, edited by Yonghua Li, Hanbing Yao, Xing Liu, Proc. of SPIE 13078, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510674745

ISBN: 9781510674752 (electronic)

Published by

SPIE

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

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

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.

**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

vii *Conference Committee*

WIRELESS COMMUNICATION AND INTELLIGENT INFORMATION PROCESSING

- 13078 02 **Calligraphy font text detection based on attention mechanism feature fusion and enhancement** [13078-35]
- 13078 03 **Transmission delay control technology of low voltage carrier reading system based on micro power wireless communication** [13078-18]
- 13078 04 **Multi-branch fusion module for siamese object tracking** [13078-23]
- 13078 05 **Joint optimization of STAR-RIS assisted SWIPT communication systems** [13078-42]
- 13078 06 **Research and application of satellite communication rainfall attenuation management system** [13078-24]
- 13078 07 **Safety adaptive oversampling method combined with radial-based undersampling** [13078-46]
- 13078 08 **Pyramid convolution and multi-frequency spatial attention for fine-grained visual categorization** [13078-10]
- 13078 09 **VGG16 hardware design and implementation for CNN in image recognition** [13078-32]
- 13078 0A **IGPPM: interface grouped probabilistic packet marking scheme for IP traceback** [13078-44]
- 13078 0B **A lightweight image super-resolution network based on large receptive field information distillation** [13078-6]
- 13078 0C **A classification model for signals of seismic events based on vision transformer** [13078-21]
- 13078 0D **Improved UNILM model based on keyword technique** [13078-3]
- 13078 0E **A hospital positioning system based on BLE beacons** [13078-37]
- 13078 0F **Personalized differential privacy approach in the federated learning scenario** [13078-8]
- 13078 0G **A power communication scheme integrating 5G network and SD-WAN** [13078-11]
- 13078 0H **Research on dynamic robust visual SLAM method based on deep learning** [13078-26]

- 13078 OI **Position control of mobile robot based on deep reinforcement learning** [13078-36]
- 13078 OJ **Multi-modal deep feature fusion for superheat identification in aluminum electrolysis** [13078-38]
- 13078 OK **Joint decision-making of communication waveform and power based on Q-learning** [13078-2]
- 13078 OL **Study on communication system fault prediction based on multivariate grey model** [13078-47]
- 13078 OM **Research on sensor dirt recognition of autonomous vehicle camera based on deep learning** [13078-27]
- 13078 ON **Intelligent anti-jamming scheme of UAV swarm based on DQN** [13078-48]
- 13078 OO **UL-TDOA airport baggage positioning system based on UWB and Wi-Fi technologies** [13078-30]

HIGH PERFORMANCE ALGORITHM AND DATA DETECTION MODEL

- 13078 OP **Accelerating convolutional neural network models based on wavelet transform** [13078-34]
- 13078 OQ **Multi-task traffic scene detection algorithm based on large kernel attention** [13078-13]
- 13078 OR **A new multistrategy fusion-based slime mould algorithm** [13078-16]
- 13078 OS **Bearing temperature prediction of hydroelectric unit based on PSO-SVR** [13078-14]
- 13078 OT **Risk detection method for power grid equipment operation based on deep Q-learning algorithm** [13078-17]
- 13078 OU **Dual-carbon data fusion cleaning model based on Kafka cluster** [13078-51]
- 13078 OV **Research on real-time storage of hybrid data for multi-task dispatching of power grid supported by new mining method** [13078-50]
- 13078 OW **A hardware Trojan detection method based on sensor chains for post-quantum classic McEliece circuits** [13078-31]
- 13078 OX **Research on vertical handoff decision algorithm for heterogeneous wireless networks considering terminal preference in the high-density access environment** [13078-15]
- 13078 OY **Research and implementation of heterogeneous database synchronization technology based on cloud-native architecture** [13078-43]
- 13078 OZ **A reinforcement learning model for the knowledge graph of imperial Guangdong maritime customs archival translation** [13078-53]

- 13078 10 **SSA-LSTM high-speed railway track irregularity prediction model based on dual-stage decomposition** [13078-41]
- 13078 11 **Research on authentication methods for video devices based on embedded MCU** [13078-9]
- 13078 12 **Electrolyzer performance prediction method based on knowledge graph** [13078-12]
- 13078 13 **Network traffic anomaly detection based on attention mechanism with LSTM** [13078-7]
- 13078 14 **A deep fuzzy multiple kernel classification algorithm based on improved class mean distance fuzzy membership function** [13078-45]
- 13078 15 **Research on buffer overflow vulnerability detection model based on Bi-GRU and attention mechanism** [13078-20]
- 13078 16 **Design and implementation of flight simulation visual database based on worldwide database of Mantis** [13078-33]
- 13078 17 **Smart education case: a detection method of the driver's smoking behavior** [13078-4]
- 13078 18 **Log anomaly detection method based on CNN and LSTM fusion** [13078-5]