## PROCEEDINGS OF SPIE

# International Conference on Electronic Information Engineering and Data Processing (EIEDP 2023)

Zeashan Hameed Khan Valentina E. Balas Editors

17–19 March 2023 Nanchang, China

Organized by National Polytechnic School (Algeria) Nanchang University (China)

Sponsored by Sichuan University (China)

Published by SPIE

Volume 12700

Proceedings of SPIE 0277-786X, V. 12700

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

International Conference on Electronic Information Engineering and Data Processing (EIEDP 2023), edited by Zeashan Hameed Khan, Valentina E. Balas, Proc. of SPIE Vol. 12700, 1270001 © 2023 SPIE · 0277-786X · doi: 10.1117/12.2686441

Proc. of SPIE Vol. 12700 1270001-1

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 International Conference on Electronic Information Engineering and Data Processing (EIEDP 2023), edited by Zeashan Hameed Khan, Valentina E. Balas, Proc. of SPIE 12700, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X ISSN: 1996-756X (electronic)

ISBN: 9781510666160 ISBN: 9781510666177 (electronic)

Published by **SPIE** P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.org Copyright © 2023 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

xi Conference Committee

## **BIG DATA MINING AND INFORMATION MANAGEMENT**

12700 02	Information selection optimized design of distributed GRS codes in coded cooperative communication [12700-59]
12700 03	A survey on event connections and their discovery for cloud service [12700-100]
12700 04	Enterprise carbon emission prediction algorithm based on multidimensional characteristic data [12700-61]
12700 05	An IoTService modelling approach with the capability of binding to business processes [12700-21]
12700 06	Weighted k-core community search on heterogeneous information networks [12700-27]
12700 07	Design of double-encrypted data transmission device with multiple concurrent communication methods [12700-71]
12700 08	Aspect-level sentiment classification based on aspect-oriented information and inter-aspect relations [12700-106]
12700 09	Efficient multi-dimensional dynamic aggregation scheme for location security [12700-23]
12700 0A	Analysis of seismic anomalies in northern state of New Zealand based on Schumann resonance time-frequency diagram [12700-19]
12700 OB	Multi-feature Chinese semantic role labeling combined with global information [12700-121]
12700 OC	Design of real-time distributed data collection and analysis system [12700-26]
12700 OD	Knowledge graph-assisted collaborative filtering for course recommendation in Mooc [12700-118]
12700 OE	Design of forest fire risk meteorological forecast model based on data superposition [12700-124]
12700 OF	A blockchain-based intelligent transportation devices and data management method [12700-90]
12700 0G	Design of data acquisition and monitoring system for motor battery of new energy site test vehicle based on CAN [12700-14]

12700 OH	Research on fusion evaluation of numerical and real tests based on prior information reliability [12700-123]
12700 01	Method of uncertainty analysis and error evaluation of wind-wind output [12700-6]
12700 OJ	Two-stage attentional temporal convolution and LSTM model for financial data forecasting [12700-135]
12700 OK	Tracking the prevalence of compromised passwords using long-term honeypot data [12700-20]
12700 OL	Research and optimization of massive small file processing performance based on Ceph [12700-127]
12700 OM	Evaluation and application of light pollution level based on multivariate linear method and entropy weight method [12700-87]
12700 ON	A new network segmentation method integrating branch cutting and node splitting [12700-40]
12700 00	Research on pricing mechanism of data products based on game theory [12700-52]
12700 OP	Exploring load disaggregation method for industrial loads considering economy-climate- production factors based on clustering technologies [12700-64]
12700 0Q	Analysis of the number of diners based on time series model [12700-31]
12700 OR	Review rating model based on subjective vocabulary in user reviews [12700-70]
12700 OS	Design of low-frequency phase meter based on STM32 single chip microcomputer [12700-63]
12700 OT	Anti-collision alarm system of crane against high-voltage lines based on multimodal information [12700-125]
12700 OU	Research on the evaluation of English teaching quality based on grey relational analysis [12700-79]
12700 OV	Causality between violations and failure factors in cloud service and its analysis methods: a survey [12700-108]
12700 OW	Equipment maintenance data mining based on FP-growth algorithm [12700-148]
12700 OX	The research on irregular volume measurement is based on image gray normalization method and brightness restoration method [12700-149]
	ELECTRONIC COMMUNICATION AND DIGITAL SIGNAL MONITORING
12700 OY	Maximum current speed distribution of ocean surface currents measured with high frequency surface wave radar during the period of severe tropical storm Lionrock [12700-91]

12700 OZ	A review of abnormal behavior research based on motion characteristics [12700-60]
12700 10	Cross-modal deformable DETR for RGB-D object detection [12700-140]
12700 11	<b>Research on prediction of air pollutant composition change based on deep learning</b> [12700-24]
12700 12	Research on radar servo identification system based on particle swarm optimization [12700-99]
12700 13	Zero-trust security monitoring of intelligent distribution network terminals based on 5G communication technology [12700-158]
12700 14	Scene text detection with gradient guidance [12700-150]
12700 15	IPDF: directed fuzzer for input parsing program [12700-146]
12700 16	Pipeline running state prediction based on optical fiber sensing and optimized long short-term memory learning network [12700-47]
12700 17	<b>Research on abnormal power consumption detection based on artificial intelligence</b> [12700-126]
12700 18	Wireless monitoring of transformer bushing dielectric loss based on space laser communication technology [12700-38]
12700 19	Curvature-based segmental sampling for point cloud registration [12700-88]
12700 1A	5G access selection strategy based on low-delay power service [12700-30]
12700 1B	CNN-BiLSTM sewage treatment dissolved oxygen concentration prediction model based on attention mechanism [12700-34]
12700 1C	EMD decomposition-based signal denoising method for DC electrical methods [12700-155]
12700 1D	Fault diagnosis of three-level active power filter based on hybrid logic model [12700-85]
12700 1E	Optimal scheduling of virtual power plant considering demand side response [12700-120]
12700 1F	Research on comprehensive energy metering acquisition and monitoring based on feature detector [12700-39]
12700 1G	A multi-targets simulation method based on single channel [12700-45]
12700 1H	Temperature analysis of lithium iron phosphate battery during operation based on electrochemical-thermal full coupling model [12700-101]
12700 11	A full parameter estimation method of LFM pulse signal [12700-105]

12700 1J	Simulation research on the whole process of spaceborne XTI-SAR oceanic eddy detection [12700-5]
12700 1K	Optimization model for two-level microgrid operation with demand response [12700-84]
12700 1L	Improved reverse-time migration for electromagnetic waves imaging [12700-44]
12700 1M	Prairie mouse hole target detection technology based on deep learning [12700-15]
12700 1N	Analysis of the spatial-temporal characteristics of residents' commuting trips under the impact of COVID-19: a case study in Shenzhen [12700-57]
12700 10	Intelligent broadband detection method of communication signal based on deep learning [12700-69]
12700 1P	Application of laser ultrasound in the detection of metal microstructure [12700-9]
12700 1Q	Research and exploration of digital watermarking technology based on BP neural network [12700-81]
12700 1R	Exploring the factors affecting the communication transmission performance of LORA technology [12700-80]
12700 15	A study on finite false target jamming for radar track generation [12700-112]

## COMPUTER ALGORITHM AND VISUAL PROCESSING

12700 IT	Commodity classification based on feature enhancement [12700-119]
----------	---

- 12700 IU Research on ink style image generation based on deep learning [12700-133]
- 12700 IV Improved timing synchronization algorithm for OFDM system based on ZC sequence [12700-42]
- 12700 IW Abnormal sound detection based on composite autoencoder Gaussian mixture model [12700-12]
- 12700 1X Intelligent garbage classification system based on vision and speech recognition [12700-117]
- 12700 1Y A vector compression coding algorithm based on SIMD(VCABSIMD) [12700-7]
- 12700 1Z Research on binocular stereo matching algorithm based on dynamic tilt window [12700-113]
- 12700 20 A text sentiment multi-classification method based on dual graph convolutional network [12700-58]
- 12700 21 Defect detection algorithm of lightweight chip based on improved YOLOv5s [12700-94]

12700 22	Real-time image processing of space camera based on FPGA [12700-33]
12700 23	Abnormal behavior recognition of experimental process based on improved YOLOV4 [12700-76]
12700 24	Research on improving pedestrian detection algorithm based on YOLOv5 [12700-37]
12700 25	Multi-feature extraction network cross-resolution person re-identification based on SR technology [12700-36]
12700 26	Object detection algorithm based on attention mechanism in foggy weather [12700-82]
12700 27	Clustering ensemble based on sample's representation [12700-97]
12700 28	Four-channel convolutional Chinese handwriting recognition based on MobileNetV2 [12700-74]
12700 29	Using a region-restrictive erasing method for one-stage weakly-supervised semantic segmentation [12700-75]
12700 2A	Research and optimization of RFID tag anti-collision algorithm [12700-107]
12700 2B	Research on news text classification based on TextCNN [12700-22]
12700 2C	Dimension reduction algorithm of battlefield situation data based on local preserving discriminant projection [12700-130]
12700 2D	A method to improve Ripley's function to analyze spatial pattern by factor analysis [12700-13]
12700 2E	A robust audio watermarking algorithm based on graph Fourier transform and singular value decomposition [12700-109]
12700 2F	Feature extraction based on improved ORB algorithm [12700-28]
12700 2G	Image stitching based on deep learning [12700-96]
12700 2H	Research on network security detection based on image encryption algorithm [12700-156]
12700 21	Identification of self-synchronous scrambler of error-correcting codes under BER conditions [12700-41]
12700 2J	VRDF: a network slicing algorithm based on VRF and VDF [12700-78]
12700 2K	Improved CBS algorithm based on the idea of pre-planning [12700-136]
12700 2L	Video summarization with local and global attention [12700-89]

12700 2M	Algorithm for polyp segmentation with local encoding and decoding fusion and multi-scale attention [12700-145]
12700 2N	Underwater image enhancement based on residual network and image formation model [12700-86]
12700 20	Infrared image fall detection for the elderly based on improved residual network [12700-29]
12700 2P	Research on risk identification and early warning technology of transmission line settlement in goaf [12700-143]
12700 2Q	Fault diagnosis of electric vehicle drive motor system based on BP neural network algorithm [12700-160]
12700 2R	An artificial intelligence algorithm-based house drawing recognition system for earthquake risk survey [12700-32]
12700 2S	Adaptive dynamic double-threshold signal detection algorithm [12700-137]

## AUTOMATION SOFTWARE AND SYSTEM MODELING

12700 2T	Research on fault detection of power company computer room information management automation operation and maintenance platform based on big data [12700-8]
12700 2U	Water quality detection and purification system based on STM32 [12700-138]
12700 2V	Reinforced model-agnostic counterfactual explanations for recommender systems [12700-4]
12700 2W	Two-step heterogeneous fusion hashing network for unpaired cross-modal retrieval [12700-2]
12700 2X	Design of dynamic carbon emission reduction effect evaluation model for the whole life cycle of power grid [12700-62]
12700 2Y	OpenCL-based programming library for heterogeneous computing on ReWorks operating system [12700-131]
12700 2Z	Research on the construction and application of translation memory system in computer- aided translation [12700-103]
12700 30	Evaluation model of metacognitive ability based on multi-channel self-attention and BiGRU [12700-46]
12700 31	RGB-D SLAM in dynamic environments with deep learning [12700-153]
12700 32	Design of intelligent wheelchair obstacle detection system based on multiple ultrasonic waves [12700-77]
12700 33	Intelligent space disinfection system based on microcontroller [12700-134]

12700 34	Implementation of script system based on recording and playback with EventBus in industrial software [12700-17]
12700 35	Study on the joint fresh-keeping of fresh product supply chain system considering fresh- keeping effort [12700-93]
12700 36	HKIT-Trans: Huber-KNN and improved tab-transformer model for network security situation prediction [12700-50]
12700 37	Intelligent safety production monitoring system based on UWB [12700-92]
12700 38	On the design of decentralized control of linear time-varying interconnected systems with unmeasurable states via Riccati equations [12700-141]
12700 39	Simulation analysis and evaluation of the effect of jammer shielding aircraft [12700-115]
12700 3A	Application of error prevention system for distribution network [12700-154]
12700 3B	Research on UAV video motion target detection method based on optical flow network [12700-116]
12700 3C	Application of machine learning in anti-pancreatic cancer drugs [12700-68]
12700 3D	An effective model based on machine learning for water quality prediction after desalination [12700-3]
12700 3E	Edge network intrusion detection method based on feature selection and TextCNN [12700-122]
12700 3F	Image-based method to defend against Android malware adversarial examples [12700-98]
12700 3G	Construction of user abnormal behavior detection model based on smart charging platform for electric vehicles [12700-10]
12700 3H	Research on heterogeneous network fusion of industrial internet [12700-132]
12700 31	Graph neural network-based light-weight recommendation system [12700-48]
12700 3J	Automatic road disaster detection technologies: a comprehensive review of developmental progress [12700-157]
12700 3K	A vulnerability automation exploitation method based on symbolic execution [12700-56]
12700 3L	Adaptive HELLO interval based on neural network and multicriteria for UANET [12700-83]
12700 3M	Simplified evaluation method of measurement uncertainty of automatic testing system of twin-wheel side force coefficient [12700-35]

- 12700 3N Analysis of domestic LoRa application based on bibliometry [12700-128]
- 12700 30 Design and implementation of fire alarm module for smart home [12700-18]
- 12700 3P Multimodal MRI brain tumor image segmentation network based on U-Net [12700-16]
- 12700 3Q Design and implementation of 4K ultra HD video recording and playback system based on HI3531D [12700-104]
- 12700 3R Study on financial internal control strategies of SMEs in the context of big data [12700-142]

## **Conference Committee**

### General Conference Chairs

Yongjin Zhou, Shanghai University (China) Hao Pan, Wuhan University of Technology (China) Samir Ladaci, National Polytechnic School (Algeria)

## Technical Program Committee Chairs

 Haiquan Zhao, Southwest Jiaotong University (China)
Zeashan Hameed Khan, National University of Sciences and Technology (Pakistan)

## **Publication Chairs**

Junhua Li, Nanchang Hangkong University (China) Valentina Emilia Balas, Aurel Vlaicu University of Arad (Romania)

#### Local Chairs

Xianxi Luo, East China University of Technology (China) Lisu Yu, Nanchang University (China)

#### Technical Program Committee Members

Imran Ahmed, IMSciences Peshawar, Centre for Excellence in Information Technology (Pakistan) Shuanghua Yang, Southern University of Science and Technology (China) Xiangbin Yu, Nanjing University of Aeronautics and Astronautics (China) Shuren Zhu, GuangDong University of Finance & Economics (Ching) **Zhongjun Ma**, Guilin University of Electronic Technology (China) Hejin Xiong, Wuhan University of Technology (China) Ali Ukasha, Sebha University (Libya) Bin Zi, Hefei University of Technology (China) Zhanwen Liu, Chang'an University (China) Zhaoxia Guo, Sichuan University (China) K. P. N. Jayasena, Sabaragamuwa University of Sri Lanka (Sri Lanka) Naruephorn Tengtrairat, Payap University (Thailand) Koh You Beng, University of Malaya (Malaysia)

Eyad M. Alazam, Yarmouk University (Jordan) Zeyneb Kurt, Northumbria University (United Kingdom) V. Rossano, University of Bari (Italy)

Academic Committee Members

**Georgios Theodoropoulos**, Southern University of Science and Technology (United Kingdom)

Jinwei Wang, Nanjing University of Information Science & Technology (China)

Gong Zhang, Nanjing University of Aeronautics and Astronautics (China)

Abdel-Badeeh M. Salem, Ain Shams University (Egypt) Phaklen Ehkan, University Malaysia Perlis (Malaysia) Ahrar Husain, Jamia Millia Islamia (India) Chunbo Xiu, Tianjin University of Technology (China) Xiaodi Li, Shandong Normal University (China) Yan Zhang, Shandong Jiaotong University (China) Peng Chen, Southwest Jiaotong University (China)