PROCEEDINGS OF SPIE

Third International Seminar on Artificial Intelligence, Networking, and Information Technology (AINIT 2022)

Naijing Hu Guanglin Zhang Editors

23–25 September 2022 Shanghai, China

Organized by Shanghai Pudong New Area Association for Computer (China)

Sponsored by
Shanghai Lixin University of Accounting and Finance (China)
AEIC Academic Exchange Information Centre (China)

Published by SPIE

Volume 12587

Proceedings of SPIE 0277-786X, V. 12587

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

Third International Seminar on Artificial Intelligence, Networking, and Information Technology (AINIT 2022), edited by Naijing Hu, Guanglin Zhang, Proc. of SPIE Vol. 12587, 1258701 © 2023 SPIE · 0277-786X · doi: 10.1117/12.2672809

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 Third International Seminar on Artificial Intelligence, Networking, and Information Technology (AINIT 2022), edited by Naijing Hu, Guanglin Zhang, Proc. of SPIE 12587, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510662964

ISBN: 9781510662971 (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

ix Conference Committees

RESEARCH ON ELECTROMECHANICAL CONTROL AND INFORMATION TECHNOLOGY

12587 02	Research on multi-channel interaction optimization design of household intelligent clothes hanger based on Kano-QFD [12587-3]
12587 03	Research on the design technology of mobile Mix-YOLOv5s model [12587-83]
12587 04	Household occupancy and energy consumption prediction for energy data big data mining [12587-64]
12587 05	A service load interval prediction method for cloud-edge collaborations based on type identification and SVMs [12587-6]
12587 06	Target high precision horizontal region detection based on improved faster R-CNN [12587-45]
12587 07	Technology research of micro air-launched decoy [12587-72]
12587 08	An efficient differential privacy federated learning scheme with optimal adaptive client number K [12587-27]
12587 09	Research on the layout of electromagnetic radiation measurement points for explosion of energetic materials [12587-16]
12587 0A	Application design of the time-based access control system [12587-56]
12587 OB	Prediction model of disease and pest epidemic of jujube based on Internet of Things [12587-81]
12587 OC	Effect of two typical wing forms on aerodynamic characteristics of mid-cylindrical airship [12587-78]
12587 0D	Advantage policy update based on proximal policy optimization [12587-15]
12587 OE	Anti-noise kinematic controller for redundant manipulators based on model driven neural network [12587-77]
12587 OF	Modeling and optimization design for RF humidity perception in storage environment [12587-82]
12587 OG	Heterogeneous database integration method of electric power enterprise based on XML [12587-25]

12587 OH	DOA estimation of rail transit tunnel far field signals based on reconstructive subspace MUSIC [12587-26]
12587 01	Wind power prediction method based on multi-loop improved gradient boosting decision tree [12587-74]
12587 OJ	An intrusion detection model using smote and ensemble learning [12587-36]
12587 OK	Application of the compressed sensing theory in the IR-UWB system channel estimation [12587-46]
12587 OL	A simple semantic ranking approach for entity linking [12587-43]
12587 OM	Event entity alignment for multi-source encyclopedia knowledge bases with the similarity of event element sets [12587-4]
12587 ON	Research on Bitcoin address classification based on transaction history features [12587-21]
12587 00	Research on grain yield prediction model based on wavelet transform and LSTM [12587-53]
12587 OP	Research on marketing intelligence inspection based on RPA technology [12587-69]
12587 0Q	Incidence trend and prediction of hepatitis C based on stacked LSTM [12587-80]
12587 OR	Analysis of maritime unmanned combat cluster employment in the context of anti-intervention/area denial [12587-55]
12587 0\$	Support samples guided adversarial generalization [12587-67]
12587 OT	Class-wise knowledge distillation [12587-59]
	NETWORK SYSTEM MONITORING AND IMAGE RECOGNITION
12587 OU	Normalization method of encryption source in mimicry simulation system [12587-65]
12587 0V	Target scale information detection based on improved Faster R-CNN [12587-23]
12587 OW	A lightweight model for encrypted traffic classification through sequence modeling [12587-33]
12587 0X	Face and gesture recognition system based on OpenCV [12587-58]
12587 OY	Research on image captioning based on LSTM and YOLOv5 fusion attention mechanism [12587-73]
12587 OZ	Research on chest x-ray image diagnosis of COVID-19 based on improved ResNet [12587-63]

12587 10	BMSAD: behavior feature and multi-scenario-based Sybil attack detection method in vehicular networks [12587-71]
12587 11	Click-through rate prediction based on behavioral sequences [12587-20]
12587 12	Dynamic environment monitoring system of digital twin computer room based on Drools inference engine [12587-7]
12587 13	The design of an experimental cloud resource provisioning language [12587-10]
12587 14	Accelerating real-time music beat tracking based on hidden Markov model by using genre information [12587-51]
12587 15	Research on melanoma image segmentation method based on improved SwinUNet [12587-19]
12587 16	A lightweight hyperspectral image classification framework based on spectral domain discretization [12587-13]
12587 17	Early warning method of power supply enterprise service network public opinion based on fuzzy reasoning [12587-54]
12587 18	Design of gesture recognition system based on machine vision [12587-31]
12587 19	Reference aware attention based medical image diagnosis [12587-60]
12587 1A	Analysis and prediction of network connection behavior anomaly based on knowledge graph features [12587-44]
12587 1B	Reversible data hiding in encrypted domain based on color image channel correlation [12587-35]
12587 1C	Automatic keyword extraction based on dependency parsing and BERT semantic weighting [12587-17]
12587 1D	Multi-scale feature fusion network with spatial-temporal alignment for video denoising [12587-32]
12587 1E	Dormancy strategy for temporal-spatial correlated nodes in wireless sensor networks [12587-14]
12587 1F	A keyword extraction method for Chinese professional field text based on improved RAKE [12587-22]
12587 1G	Emotion recognition research of eye-movement feature extraction classification network in online video learning environment $[12587-40]$
12587 1H	Signal recognition methods in motor imagery BCI [12587-84]
12587 11	FFG feature extraction methods in motor imagery brain computer interface [12587-85]

ARTIFICIAL INTELLIGENCE ALGORITHMS AND DEEP LEARNING

12587 1J	Deep learning captcha recognition for mobile based on TensorFlow [12587-79]
12587 1K	Research on feature extraction algorithm based on meta-learning [12587-41]
12587 1L	Video-text cross-modal retrieval algorithm based on multiple coding [12587-75]
12587 1M	Improved foggy pedestrian detection algorithm based on YOLOv5s [12587-42]
12587 1N	UAV 3D route planning algorithm based on improved RRT [12587-61]
12587 10	A labeling algorithm to solve the shortest path problem with additional constraints [12587-12]
12587 1P	UAV path planning algorithm based on improved RRT [12587-68]
12587 1Q	Research on health bracelet based on BP neural network algorithm [12587-28]
12587 1R	Research on key technologies of network public opinion warning based on improved stacking algorithm [12587-52]
12587 1\$	Emotion recognition of multimodal face images based on convolutional neural network [12587-34]
12587 1T	Nonradiative infrared thermography detection based on artificial intelligence analysis replaces traditional CT detection [12587-9]
12587 1U	Research on multimodal online learning status evaluation based on video camera [12587-49]
12587 1V	A continual encrypted traffic classification algorithm based on WGAN [12587-11]
12587 1W	Distributed machine learning framework and algorithm implementation in Ps-Lite [12587-38]
12587 1X	A bi-level structured classifier integrating unsupervised and supervised machine learning models [12587-8]
12587 1Y	An infrared small vehicle target detection method based on deep learning [12587-30]
12587 1Z	An optimized hybrid evolutionary algorithm for accelerating automatic code optimization [12587-39]
12587 20	Flexible production line product research and development and manufacturing cloud platform based on intelligent data collaboration [12587-5]

12587 21	Intelligent robot navigation system based on data mining algorithm [12587-76]
12587 22	Fraudulent promotion detection on GitHub using heterogeneous neural network [12587-57]
12587 23	Growing neural networks using orthogonal initialization [12587-70]
12587 24	Multiclass malicious URL attack type detection via capsule-based neural network [12587-18]
12587 25	Research on the identification method of poor students based on SVM and decision tree algorithm [12587-2]
12587 26	T-S fuzzy model identification based on improved interval type-2 fuzzy c-means clustering algorithm [12587-66]
12587 27	Research on the prediction of drag and torque based on BP algorithm [12587-47]
12587 28	A Bayesian deep learning method for credit card fraud detection with uncertainty quantification [12587-37]

Conference Committees

Conference General Chair

Naijing Hu, Shanghai Lixin University of Accounting and Finance (China)

Technical Program Committee Chair

Yang Yang, Terminus Technology Group (China)

Publication Chairs

Guanglin Zhang, Donghua University (China) **Arun Balodi**, Visvesvaraya Technological University (India)

Organizing Committee Chair

Ling Xiao, Guangzhou Sport University (China)

Organizing Committees

Nan Wang, Shanghai Nokia Bell Co., (China)

Yanliang Jin, Shanghai University (China)

Lisu Yu, Nanchang University (China)

Ke-Jun Li, Shandong University (China)

Mariofanna Milanova, University of Arkansas at Little Rock (United States)

Badrul Hisham bin Ahmad, Universiti Teknikal Malaysia Melaka (Malaysia)

Jie Zheng, ShanghaiTech University (China)

Lin Gui, Shanghai Polytechnic University (China)

Shivani Dhall, DAV College (India)

Rahul Vishwanath Dandage, Rajendra Mane College of Engineering & Technology (Devrukh)

Surej Rajan C, Toc H Institute of Science and Technology (Arakunnam)

Liping Xi, Shanghai Pudong New Area Association for Computer (China)

Guohua Yang, Shanghai Internet Software (Group) Co., (China)

Zhifeng He, Shanghai Hongdi Information Technology Co., (China)

Bin Xue, National University of Defense Technology (China)

Technical Program Committees

Zhiyong Zhang, Henan University of Science and Technology (China)
Michal Feckan, Comenius University in Bratislava (Slovakia)
Shuanghua Yang, Southern University of Science and Technology, (China)
Tao Wang, Sun Yat-Sen University (China)
Nada M. Al Hakkak, Baghdad College (Iraq)
Babu George, Fort Hays State University (United States)
Juliaqing Zheng, California Baptist University (United States)
Ayush Dogra, Panjab University (India)