PROCEEDINGS OF SPIE

International Conference on Cloud Computing, Performance Computing, and Deep Learning (CCPCDL 2022)

Sandeep Saxena Editor

11–13 March 2022 Wuhan, China

Organized by Chongqing University (China) Dalian University of Technology (China) Nanjing University of Science and Technology (China) Sichuan University (China) Wuhan University (China)

Sponsored by Academic Exchange Information Center (China)

Published by SPIE

Volume 12287

Proceedings of SPIE 0277-786X, V. 12287 SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

International Conference on Cloud Computing, Performance Computing, and Deep Learning (CCPCDL 2022), edited by Sandeep Saxena, Proc. of SPIE Vol. 12287, 1228701 · © 2022 SPIE · 0277-786X · doi: 10.1117/12.2655734

Proc. of SPIE Vol. 12287 1228701-1

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 Cloud Computing, Performance Computing, and Deep Learning (CCPCDL 2022), edited by Sandeep Saxena, Proc. of SPIE 12287, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510655867 ISBN: 9781510655874 (electronic)

Published by **SPIE** P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.org Copyright © 2022 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 Committee

CLOUD COMPUTING TECHNOLOGY AND ALGORITHM TARGET DETECTION

12287 02	Object detection algorithms based on deep learning [12287-98]
12287 03	Mask detection and classification with different convolutional neural networks [12287-48]
12287 04	Basic search algorithms in Python [12287-1]
12287 05	A review of key algorithms for network security situation awareness research [12287-31]
12287 06	Research on PCB defect detection based on YOLOv3 network [12287-16]
12287 07	An improved RANSAC algorithm for detection, extraction, and enhancement of noisy indoor house type image lines [12287-18]
12287 08	Deployment algorithms of UAV flying base stations based on 5G [12287-30]
12287 09	The construction of a virtual simulation training platform for computer-aided teaching and research courses [12287-35]
12287 0A	An efficient automatic testing framework for NFV systems [12287-41]
12287 OB	Recognition for American Sign Language letters based on AutoML platform [12287-94]
12287 OC	An efficient federated learning optimization algorithm on non-IID data [12287-66]
12287 0D	Label-only membership inference attack based on the transferability of adversarial sample [12287-21]
12287 OE	Research on real-time identification method of pig number based on 5G and convolutional neural network [12287-17]
12287 OF	TextC/R/RCNN for multi-label classification based ICD coding [12287-5]
12287 0G	Network security situation prediction model based on grey wolf optimization algorithm to optimize support vector machine [12287-29]
12287 OH	A scoring algorithm based on retrieval term expansion [12287-83]

12287 OI	Resource allocation algorithm for energy efficiency optimization of multicarrier NOMA
	downlink system [12287-72]

- 12287 0J The application of the mask detection based on automatic machine learning [12287-56]
- 12287 0K Research on the parking planning algorithm based on DDPG and TD3 [12287-52]
- 12287 OL Bearing fault diagnosis based on convolution gated recurrent neural network [12287-80]
- 12287 0M Cluster head selection algorithm based on levy flight butterfly optimization algorithm in WSN [12287-73]
- 12287 ON Real time road sign detection based on YOLO and Swift [12287-46]
- 12287 00 Optimization method for distributed energy access to distribution network based on chaotic genetic simulated annealing algorithm [12287-70]
- 12287 0P Unsupervised confident co-promoting: refinery for pseudo labels on unsupervised person re-identification [12287-39]
- 12287 0Q Research on the application of cloud computing technology in computer laboratory construction and management [12287-8]
- 12287 OR Lightweight application management architecture based on container cloud [12287-77]
- 12287 0S Malaria cell classification with residual neural network [12287-79]
- 12287 0T Design and implementation of small private cloud system with highly reliable management and monitoring [12287-19]
- 12287 0U Some typical algorithms of Chinese handwriting text recognition in history [12287-69]
- 12287 0V Multi-scale weighted image enhancement algorithm based on HSV space [12287-6]
- 12287 0W Small object detection in remote sensing images based on target cluster and multi-scale prediction [12287-93]

INTELLIGENT PERFORMANCE COMPUTING AND IOT BIG DATA

12287 OX	Research on calculation methods of taxi passenger volume based on satellite positioning data [12287-24]
12287 OY	Trusted regulatory technology for blockchain data privacy protection [12287-90]
12287 OZ	Convolutional neural networks' efficiency on binary classification of damaged building on post hurricane satellite imagery [12287-81]

12287 10	Performance of cloud native network function date plane [12287-7]
12287 11	Context-based interactive multimodal sentiment analysis [12287-40]
12287 12	Research on intelligent warehouse digital twin system based on digital twin [12287-97]
12287 13	Effectiveness of data augmentation on deep based post-hurricane building classification using satellite images [12287-62]
12287 14	Damaged buildings classification using residual network [12287-50]
12287 15	SECure: SE block-based classification of buildings post hurricane [12287-89]
12287 16	Overview of mobile communication network architecture based on federated learning [12287-9]
12287 17	The research on inspection technology of transmission channel based on high resolution satellite image data [12287-92]
12287 18	Attention-based multi-scale network for hyperspectral image classification [12287-38]
12287 19	Research on task-driven edge computing system in V2X scenarios [12287-33]
12287 1A	Image sentiment analysis method based on multi-level feature fusion [12287-26]
12287 1B	Data enhancement analysis for deep-based image classification [12287-53]
12287 1C	Mutual learning graph convolutional network for hyperspectral image classification [12287-34]
12287 1D	Image steganography based on least bias generative adversarial network [12287-12]
12287 1E	Multi-objective vehicle path planning based on DQN [12287-4]
12287 1F	Study on ergonomic design of artificial intelligence lower limb assist brace for the elderly [12287-49]
12287 1G	Anomaly detection based on multi-source heterogeneous data fusion [12287-45]
12287 1H	A brief analysis on damaged building classification: optimizer and learning rate [12287-71]
12287 11	Adaptive computation offloading and resource allocation method for mobile edge computing [12287-55]
12287 1J	Classifying buildings post hurricane with contrast enhancement [12287-99]
12287 1K	Measurement of distance between vehicles based on monocular vision [12287-85]

۷

- 12287 1L Research on distributed collaboration framework for BIM big data model [12287-22]
- 12287 1M The CreateML-based compared to the AutoML-based approach to animal image classification [12287-57]

DEEP LEARNING AND COMPUTER MODELING PREDICTION

- 12287 1N Classifying buildings post hurricane based on transfer learning [12287-67]
- 12287 10 Search and application of gas load prediction method based on LSTM [12287-86]
- 12287 1P Research and application of integrated power system based on deep learning [12287-14]
- 12287 1Q Time-aware QoS prediction for multi-task graph attention networks [12287-96]
- 12287 1R Drug quality re-inspection based on YOLO deep learning [12287-82]
- 12287 1S Power control of spectrum sharing for USVs via deep Q-networks [12287-44]
- 12287 11 Research on medical named entity recognition based on DB-MA-BiLSTM-CRF [12287-25]
- 12287 1U The application of deep learning-based face recognition system in public safety [12287-3]
- 12287 1V Small sample datasets build powerful image classification models [12287-78]
- 12287 1W PM2.5 concentration prediction based on temporal convolutional network [12287-43]
- 12287 1X Chinese text paraphrase recognition based on OpenPrompt introducing hybrid prompts [12287-27]
- 12287 1Y COVID-19 pandemic prediction using machine learning methods [12287-84]
- 12287 1Z Attention based spatio-temporal generative adversarial network for sparse traffic forecasting [12287-15]
- 12287 20 Study on IC₅₀ prediction of targeted drugs for hepatoma cells based on SSA-BP neural network [12287-91]
- 12287 21 Mask classification using deep learning methods [12287-59]
- 12287 22 Research on fire detection algorithm based on deep learning [12287-76]
- 12287 23 Improved varifocal net: a deep learning approach for rice pest detection [12287-10]

- 12287 24 AlexNet based facial expression classification [12287-74]
- 12287 25 Modified BERT-based end-to-end Chinese named entity recognition model [12287-95]
- 12287 26 Dynamic network representation learning based on temporal neighborhood aggregation [12287-51]
- 12287 27 A study of sentiment classification methods with dual model decision fusion [12287-32]
- 12287 28 Comparative analysis of mask detection models and mobile device deployment based on different automated machine learning platforms [12287-65]
- 12287 29 A segmentation method for building in remote sensing image based on deep learning [12287-28]
- 12287 2A Research on emotion recognition in network video [12287-61]
- 12287 28 Day-ahead load forecasting based on Spearman-MultiTaskLasso-MLP [12287-58]
- 12287 2C COVID-19 infection prediction using physical signs [12287-75]
- 12287 2D Link prediction based on collaborative filtering [12287-23]
- 12287 2E AGC: automated machine learning for garbage classification on mobile devices [12287-64]
- 12287 2F Identification of industrial control devices based on CNN-PCA hybrid feature extraction [12287-13]
- 12287 2G Research on credit assessment and prediction based on deep learning [12287-42]
- 12287 2H Target detection models based on deep learning [12287-87]
- 12287 21 Prediction of thermal insulation performance of vacuum glass based on extreme random forest model [12287-11]
- 12287 2J SINS/DVL integrated based on interacting multiple model approach by integrating feedback particle filter for ship navigation [12287-20]
- 12287 2K Falling detection based on deep learning and video classifier [12287-88]

Conference Committees

Conference Chair

Bakshi Hardeep Vaid, School of Marine Sciences, Nanjing University of Information Science and Technology (China)

Committee Chair

Yuanzhu Chen, School of Computing, Queen's University (Canada)

Academic Committees

Sandeep Saxena, Department of Information Technology
Galgotias College of Engineering and Technology (India)
Rajesh S. Bansode, in IT Department at TCET w.e.f (India)
Noreddine Gherabi, Sultan Moulay Slimane University (Morocco)
Zhihan Lv, Qingdao University, Haier IoC Research Institute (China)
Chengyuan He, Asia University (China)
Rajeev Tiwari, Department of Virtualization School of Computer
Science, University of Petroleum and Energy Studies (India)
Sahil Verma, Lovely Professional University (India)
Marina Yusoff, Faculty of Computer and Mathematical Sciences
University Teknologi (Malaysia)
Khaja Mohiddin, Bhilai Institute of Technology (India)
Wan nor Shuhadan Wan Nik, University Sulatan Zainal Abidin
Terengganu (Malaysia)
Attlee Munyaradzi Gamundani, Namibia University of Science and Technology (South Africa)

Program Committees

 Ling Cen, South China University of Technology (China)
Johan Debayle, Ecole Nationale Supérieure des Mines de Saint-Etienne (France)
Nirmalya Thakur, University of Cincinnati (United States) Ziyan Zhang, Hainan Tropical Ocean University (China)

- **D. Jude Hemanth**, Karunya University, Department of Electronics and Communication Engineering (India)
- **Omar Dib**, The College of Science and Technology at Wenzhou-Kean University (China)
- **Muhammad Aslam**, School of Cyber Science and Engineering Wuhan University (China)
- **Prateek Saurabh Srivastav**, Institute of Microelectronics of Chinese Academy of Sciences, University of Chinese Academy of Sciences (China)
- Azim Zaliha Abd Aziz, Faculty of Informatics and Computing University Sultan Zainal Abidin (Malaysia)
- Vijayakumar Varadarajan, ARPA Digital Technology Co., Ltd. (China)
- Aslina Baharum, User Experience Research Lab, University Malaysia Sabah (Malaysia)