PROCEEDINGS OF SPIE

Third International Conference on Advanced Algorithms and Signal Image Processing (AASIP 2023)

Kannimuthu Subramaniam Pavel Loskot Editors

30 June – 2 July 2023 Kuala Lumpur, Malaysia

Organized by University of Malaya (Malaysia)

Sponsored by
National Taipei University of Technology (China)
AEIC—Academic Exchange Information Centre (China)

Published by SPIE

Volume 12799

Part One of Two Parts

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 Conference on Advanced Algorithms and Signal Image Processing (AASIP 2023)*, edited by Kannimuthu Subramaniam, Pavel Loskot, Proc. of SPIE 12799, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510668522

ISBN: 9781510668539 (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

xv Conference Committee

Part One

ADVANCED ALGORITHM AND INTELLIGENT DATA FUSION

12799 02	Particle swarm optimization algorithm variant: applying to the parameter identification of the projectile [12799-236]
12799 03	FC-NT: a crime prediction algorithm incorporating formal context and neural networks [12799-145]
12799 04	Wind identification of rotating projectile using improved multi-objective particle swarm optimization [12799-240]
12799 05	Cross-network node alignment algorithm based on following relationship and username similarity [12799-170]
12799 06	A review of intelligent vehicle motion planning algorithms [12799-107]
12799 07	A light pollution risk intervention strategy optimization model based on improved PCA clustering algorithm [12799-138]
12799 08	An FPGA routing algorithm to improve efficiency and quality [12799-69]
12799 09	An error verification design of DDC based on MATLAB and FPGA [12799-210]
12799 OA	Research progress and prospects of intelligent planning algorithms in navigation collision avoidance [12799-117]
12799 OB	Research on determining the end point of carbon kneading based on LSTM algorithm [12799-113]
12799 OC	Pavement grade recognition algorithm based on sprung mass acceleration [12799-13]
12799 0D	Research on distributed network information security diagnosis method based on matrix algorithm [12799-165]
12799 OE	Two-dimensional array antenna directional pattern optimization method based on genetic simulated annealing algorithm [12799-47]

12799 OF	Air defense target allocation based on improved genetic algorithm [12799-22]
12799 0G	Research on visible and infrared binocular image fusion algorithm based on improved NSCT [12799-135]
12799 OH	Study and application of migration technology in ground penetrating radar (GPR) data processing [12799-78]
12799 01	Load forecasting analysis based on the residential electricity consumption data of BP neural network [12799-259]
12799 OJ	Performance of BOK-MPSK chirp modulation for data transmission [12799-184]
12799 OK	Anomaly detection method of power purchase material data based on BIRCH clustering algorithm and time series [12799-153]
12799 OL	The underwater dynamic environment RSSI ranging filtering algorithm [12799-262]
12799 OM	Research on voice print feature extraction technology of GIS equipment based on speech signal processing [12799-258]
12799 ON	Infrared small target recognition based on Yolov5 and centriod tracking algorithm [12799-204]
12799 00	The proposal and application of an intelligent algorithm: lion swarm algorithm [12799-127]
12799 OP	Fault identification method for substation power equipment based on infrared, visible light images, and YOLOv5 algorithm [12799-130]
12799 0Q	Real-time traffic sign detection algorithm based on improved YOLOv7 [12799-16]
12799 OR	Predictive modeling of gasoline octane loss based on RFE, XGBoost, and LightGBM algorithm features [12799-93]
12799 OS	Food adulteration identification framework via unsupervised anomaly detection algorithm: applied to camel milk (FIAD) [12799-95]
12799 OT	Adaptive density peaking clustering algorithm combined with sparrow search algorithm [12799-190]
12799 OU	Fish-eye image effective region segmentation algorithm based on circle fitting [12799-70]
12799 0V	Research on cloud server double end vulnerability detection based on heuristic genetic algorithm [12799-91]
12799 OW	Research on improved YOLOv5-based defect detection algorithm for cigarette air thinning head [12799-25]
12799 OX	Image enhancement algorithm for crystallization state detection of penicillin salt solution [12799-63]

12799 OY	A binary particle swarm optimization algorithm based on Cauchy mutation operator and inertia weight dynamic adjustment [12799-60]
12799 OZ	Missing identification of glass insulators based on YOLOv5 algorithm [12799-222]
12799 10	Traffic sign detection algorithm for foggy weather scenarios [12799-20]
12799 11	Modified DeepLabV3+ algorithm for casting defect detection [12799-136]
12799 12	Research on pedestrian flow detection algorithm based on Ghostnetv2 lightweight network [12799-162]
12799 13	Improved Harris corner point algorithm for anti-vibration hammer line clip gap detection [12799-163]
12799 14	A new algorithm for image edge detection based on phase stretch transform [12799-201]
12799 15	Large-scale taxi trajectory data processing based on spark distributed computing [12799-197]
12799 16	Eight-direction least-square phase unwrapping algorithm for optical three-dimensional measurement [12799-97]
12799 17	Research on Raft and PBFT algorithms in consortium blockchain application [12799-38]
12799 18	The reading recognition algorithm of pointer meter in unmanned pumping station based on YOLOv5 [12799-72]
12799 19	An image defog iteration algorithm for optimal estimation of atmospheric light direction [12799-150]
12799 1A	Autocorrelation phase retrieval function of light field for improving rendering quality [12799-106]
	MACHINE LEARNING AND NATURAL LANGUAGE PROCESSING
12799 1B	A high throughput cyclic redundancy check VLSI architecture for VVC intra block copy [12799-83]
12799 1C	Design and implementation of algorithm execution time predictor for remote sensing product workflow [12799-147]
12799 1D	Deep learning based secreted protein prediction [12799-191]
12799 1E	No-reference image quality assessment based on deep learning [12799-180]
12799 1F	Trusted authentication method for privacy information [12799-198]

12799 1G	Dual-channel interaction learning with a span-level for aspect sentiment triplet extraction [12799-94]
12799 1H	Dual-stream high-dimensional features implicit augmentation for micro-expression recognition [12799-42]
12799 11	A new type of knowledge distance in approximation space [12799-67]
12799 1J	Few-shot graph and SMILES learning for molecular property prediction [12799-26]
12799 1K	Classification of word difficulty using M-SVM algorithm [12799-51]
12799 1L	Power line time transfer technology based on LFM-OFDM and DS-OFDM modulation [12799-216]
12799 1M	A DOA estimation method for array signals based on deep learning [12799-92]
12799 1N	Comparison of cow face target detection algorithms based on deep learning [12799-174]
12799 10	Design of embedded identification system for motor vehicle engine fault based on deep learning [12799-179]
12799 1P	Tor traffic identification based on federated learning using data temporal series [12799-235]
12799 1Q	A review of stealth technology for flying targets [12799-146]
12799 1R	MHViTPose: multiscale hybrid vision transformer for human pose estimation [12799-257]
12799 1S	Application of rifling comparison technology based on deep learning [12799-169]
12799 1T	Deep learning fault diagnosis method for rolling bearings in rolling mills based on improved optimization algorithm [12799-101]
12799 1U	Research on embroidery image recognition based on deep learning [12799-61]
12799 1V	Surface defect detection of the power machinery based on deep learning [12799-79]
12799 1W	Intelligent diagnosis of vascular diseases with deep learning [12799-64]
12799 1X	Knowledge graph construction for power grid systems based on fuzzy matching algorithm [12799-205]
12799 1Y	Multi-TransPathoNet: a transfer learning-based neural network for pathology image classification with multi-task learning [12799-88]
12799 1Z	Research on deep learning-based facial expression recognition and its application in online learning state monitoring [12799-39]

12799 20	Deep learning algorithm of clustering analysis in IUR teaching system [12799-166]
12799 21	Personalized book recommendation algorithm based on fusion of content and improved collaborative filtering [12799-167]
12799 22	Research on intelligent aided design of architectural space based on deep learning [12799-68]
12799 23	Area localization of leaf diseases under complex environments [12799-212]
12799 24	Machine learning based wordle difficulty analysis [12799-234]
12799 25	Feature distillation with mixup for unsupervised continual learning [12799-40]
12799 26	2D to 3D pedestrian detection algorithm based on deep learning [12799-53]
12799 27	Research on landslide spatial prediction method based on knowledge graph [12799-253]
12799 28	Fully connected-based nonnegative matrix factorization neural network [12799-122]
12799 29	Research and implementation of Chinese lip recognition technology based on pinyin features [12799-223]
12799 2A	Research on the efficiency of combined convolutional neural network and traditional optimization methods [12799-238]
12799 2B	Quantum image encryption based on hyper-chaotic system and double-random phase encoding [12799-59]
12799 2C	A classroom student behavior detection model based on coordinate attention and fused residual networks along with its talent evaluation system [12799-148]
12799 2D	Robust network based on embedded convolutional block attention module and earth mover's distance for few-shot learning [12799-17]
	ADAPTIVE SYSTEM AND MULTIMODAL ANALYSIS
12799 2E	A new feature extraction method for short wave signal [12799-81]
12799 2F	Wavelet transform of vibration signal of CNC machine tool based on python [12799-98]
12799 2G	Narrowband target tracking method based on Gaussian mixture model [12799-224]
12799 2H	A semantic SLAM system for low texture and dynamic environments [12799-36]
12799 2I	Android malware detection method based on improved genetic algorithm [12799-82]

12799 2J	Joint prediction of discrete and continuous emotions from dance videos based on FFN [12799-24]
12799 2K	Conditional adversarial domain adaptation based on sample weight [12799-143]
12799 2L	Application development and technical analysis of rider helmet wearing monitoring system [12799-196]
12799 2M	A uniform network flow feature aggregation method based on parallel LSTM [12799-29]
12799 2N	Research on multi-objective fire station location algorithm based on risk classification [12799-33]
12799 20	Human activity recognition based on CSI in multiple scenarios [12799-254]
12799 2P	Research on optimal scheduling strategy of regional integrated energy system based on improved genetic algorithm [12799-21]
12799 2Q	A malicious programs detection method incorporating transformer and co-occurrence matrix [12799-56]
12799 2R	Digital signal processing techniques for image enhancement and restoration [12799-62]
12799 2S	Research on information recommendation method of online education platform based on user preference model [12799-225]
12799 2T	Study on maximum efficiency of wireless charging system for electric moped [12799-207]
12799 2U	Layout optimization and signal integrity analysis of high-speed differential via [12799-173]
12799 2V	Sparse-representation-based signal separation for high-speed train bearing fault diagnosis [12799-9]
12799 2W	Transient extraction from Doppler-shifted signal for track-side acoustic bearing fault diagnosis [12799-134]
12799 2X	Maximum flattened fractional delay filter based on Farrow structure [12799-183]
12799 2Y	Design of optimization method for vertical profile of large civil aircraft based on genetic algorithm: pattern search algorithm [12799-221]

Part Two

12799 2Z	Design and implementation of a new type of signal modulation measuring device [12799-112]
12799 30	Site optimization study of emergency material centre based on improved particle swarm algorithm [12799-108]
12799 31	SEL-Net: a multimodal image segmentation method based on spatial attention mechanism [12799-109]
12799 32	Transplantation and optimization calculation of power inspection image matching application based on the ARM platform $[12799\hbox{-}245]$
12799 33	Ensemble feature selection with adaptive weights [12799-202]
12799 34	Primary signal phase suppression technique based on mutual information improved variational mode decomposition [12799-239]
12799 35	Video stabilization algorithm based on multiple cameras [12799-10]
12799 36	Design of case error prevention system based on infinite frame decoding and heat map location algorithm technology [12799-157]
12799 37	VPN encrypted traffic identification model based on improved residual network [12799-102]
12799 38	A pixel affinity adaptive expansion weakly supervised skin image segmentation method [12799-244]
12799 39	Expert matrix of GFSES and its application in decision-making [12799-158]
12799 3A	Light field saliency object detection based on self-selected multi-modal fusion [12799-75]
12799 3B	Residual-based feature enhancement for forgery audio detection [12799-44]
12799 3C	Adaptive blockage detection and prevention for radar chip-based autonomous driving systems [12799-164]
12799 3D	An estimation method for gas extraction meets standards based on LSTM with adaptive step [12799-8]
12799 3E	Adaptive biogeography based optimizer evolution depth convolutional neural network for image classification [12799-76]
12799 3F	Particle swarm algorithm-based optimal scheduling of reservoirs in the middle line of South-North water diversion [12799-243]

SENSOR ARRAY AND MULTI-CHANNEL EMULATION

12799 3G	A dynamic aggregation method of distributed resources based on cloud edge collaboration [12799-248]
12799 3H	Research on improved design of QL2000 boom bucket wheel reclaimer [12799-73]
12799 31	HCT-Det: a hybrid CNN-transformer architecture for 3D object detection from point clouds [12799-43]
12799 3J	Research on accurate location algorithm of mine moving target based on UWB Information vector and CNN-LSTM [12799-23]
12799 3K	Research on M-ary spread spectrum communication system in ice-covered water based on energy monitoring technology [12799-247]
12799 3L	Collaborative attack task assignment for distributed UAV swarm using competition cooperation mechanism [12799-256]
12799 3M	Indoor object recognition based on YOLOv5 with EIOU loss function [12799-46]
12799 3N	Prediction model of dissolved oxygen concentration in sewage treatment based on CNN-LSTM network and DBSCAN [12799-15]
12799 30	Lidar 3D object semi-automatic annotation tool [12799-208]
12799 3P	Study on fracture of zirconia and alumina ceramics based on acoustic emission technology [12799-195]
12799 3Q	Equipment anomaly detection method under cloud-edge collaboration model based bi-directional long short-term memory and variational autoencoder [12799-128]
12799 3R	Identification modeling of neural network activity under stimulation [12799-249]
12799 3S	Time optimal trajectory planning of robot based on honey badger algorithm [12799-213]
12799 3T	A novel heating load forecasting method based on information entropy attention mechanism [12799-237]
12799 3U	The inversion of ocean current extraction by along-track interferometric SAR based on sea surface model [12799-178]
12799 3V	Research on power line carrier communication technology based on intelligent well completion [12799-11]
12799 3W	FPGA architecture for convolutional neural network training [12799-159]
12799 3X	Deep domain generalization method via low-rank category constraint for multi-site ASD identification [12799-260]

12799 3Y	Optimal planning algorithm for hierarchical zoning of microgrids under cooperative dispatch of multiple energy storage devices [12799-14]
12799 3Z	Optimization of single-phase inverter control algorithm for EMU [12799-233]
12799 40	The application of super-resolution image recognition technology in large-scale vehicle-to-vehicle communication [12799-220]
12799 41	Security authentication method for power monitoring system operation and maintenance scenarios based on face recognition and fingerprint recognition [12799-200]
12799 42	A hierarchical path planning algorithm based on graphical search and optimization methods [12799-175]
12799 43	Hardware acceleration for real-time vehicle object detection based on MPSoC * [12799-263]
12799 44	Research on load forecasting method for electric vehicle cluster charging in distribution network [12799-89]
12799 45	Design and implementation of a scenario classification system for the Internet of Things application [12799-120]
12799 46	Research on local point cloud map restoration based on laser SLAM [12799-181]
12799 47	A study based on weed image recognition of a corn-weed control robot [12799-28]
12799 48	A three-dimensional DV-Hop algorithm based on the improved grey wolf algorithm for wireless sensor networks [12799-77]
12799 49	Active identification method of power network topology anomaly based on graph database [12799-203]
12799 4A	DummyMAE: automatic encoder based on edge-to-vertex transformation [12799-114]
12799 4B	DCS secure communication scheme based on national cipher algorithm [12799-189]
12799 4C	Harmonic frequency and direction joint estimation for airborne acoustic target localization [12799-48]
12799 4D	Entropy-based layered evacuation strategy and simulation for multi-storey building fire scene [12799-27]
12799 4E	Research and application based on simulation of ESM model [12799-226]
12799 4F	Application of PSO optimization algorithm in power communication network security situation prediction [12799-199]
12799 4G	Identification of safety violations of overhead transmission lines based on stationing drones and YOLOv5 algorithm [12799-74]

12799 4H	A text-driven image style transfer model based on CLIP and SCBAM [12799-246]
12799 41	UAV image stabilization algorithm based on improved Shi-Tomasi [12799-211]
12799 4J	Based on the comprehensive effect model of light pollution [12799-124]
12799 4K	Multi-objective path planning for mobile robot based on ACO -APF fusion algorithm [12799-155]
12799 4L	The grab tracking method for 3D reconstruction of a waste pool [12799-31]

IMAGE FEATURE EXTRACTION AND INTELLIGENT DETECTION

12799 4M	Small sample prediction research based on optimized convolutional neural networks [12799-144]
12799 4N	Rotating stomata detection based on anchor-free networks [12799-194]
12799 40	Graph neural networks for protein-protein interactions [12799-187]
12799 4P	A method to measure similarity between semantic graphs and its applications [12799-99]
12799 4Q	Clothing Image retrieval method based on ConvNeXt [12799-123]
12799 4R	Hypergraph neural network for gait recognition based on event camera [12799-232]
12799 4S	GABP neural network identity recognition based on cross correlation method [12799-192]
12799 4T	Intelligent detection and identification method of radar moving target [12799-125]
12799 4U	Dance motion recognition method based on feature fusion [12799-90]
12799 4V	Detection of Parkinson's cognitive impairment patients based on motor and non-motor symptoms [12799-80]
12799 4W	Research and implementation of image edge detection based on Db4 wavelet transform [12799-129]
12799 4X	Research on infrared image classification of power equipment based on YOLOv7 [12799-171]
12799 4Y	A rumor detection model combining propagation structure and content features [12799-37]
12799 4Z	A novel blind medical image watermarking scheme In NSST domain based on Schur decomposition and DWT [12799-186]

12799 50	Advancing ultrasound image segmentation with a hybrid framework: integrating convolutional neural networks and active contours [12799-214]
12799 51	Experimental and theoretical research on the vibration and spectral characteristics of alumina in various states [12799-57]
12799 52	Mal-Net: multi-scale feature extraction and attention mechanism lightweight network for CSI feedback [12799-126]
12799 53	Classification of skin cancer based on composite scaling and attention [12799-12]
12799 54	Classification of x-ray images of COVID-19 based on CNN and improved swin transformer model [12799-52]
12799 55	Research on lightweight detection model of spontaneous combustion of electric vehicles [12799-84]
12799 56	Faster R-CNN-based pedestrian detection and tracking [12799-154]
12799 57	MFAD: a graph anomaly detection framework based on multi-frequency reconstruction [12799-133]
12799 58	Applying multi-modal magnetic resonance imaging radiomics in differentiating benign and malignant ovarian tumors [12799-206]
12799 59	Applying multiparametric magnetic resonance imaging in differentiating benign and malignant ovarian tumors [12799-218]
12799 5A	A visual window convolutional attention mechanism based building extraction method for remote sensing images [12799-34]
12799 5B	Spectral continuous tuning technique based on liquid crystal [12799-250]
12799 5C	Low-light image enhancement combining dehazing and auxiliary channels [12799-65]
12799 5D	Computer simulation and prediction of coordination capture of Pb $^{2+}$ and Hg $^{2+}$ by the Salophen [12799-104]
12799 5E	Low illumination image enhancement based on retinex theory [12799-35]
12799 5F	Transformer-based brightness correction for finger vein images [12799-132]
12799 5G	Speech visualization for hearing impairments: from speech to colour image sequence combining text and meaning [12799-252]
12799 5H	EZSN: efficient zero-shot network for blind super-resolution [12799-177]
12799 51	Research on uterus endometrial gland opening labeling algorithm based on medical information technology [12799-66]

12799 5J	Feature enhancement based detection of traffic signs in foggy environment [12799-18]
12799 5K	Thyroid cancer pathological classification in ultrasound images based on faster R-CNN network [12799-85]
12799 5L	Full-scale feature fusion dark-light image enhancement network [12799-71]
12799 5M	UAV image object detection network based on Yolov7 [12799-116]
12799 5N	Terahertz security detection of hazardous materials based on Unet [12799-41]
12799 50	Dehua porcelain product defect recognition based on image processing [12799-140]
12799 5P	Visualization method of BIM model based on WebGIS [12799-160]
12799 5Q	GRU-based chaotic sequence generation and its application in image encryption [12799-185]
12799 5R	Wheat ear detection based on one-stage object detector [12799-118]
12799 5S	Ensemble of deep convolutional neural networks using multi-spectral vision transformer for diabetic macular edema classification from multicolor image [12799-32]
12799 5T	An image retrieval method based on fusion of multiple features [12799-50]
12799 5U	Qualitative identification of fluorescence immunochromatography strips based on residual networks [12799-219]
12799 5V	Research on recognition method of ferrographic image wear particle based on image segmentation [12799-19]