

2023 8th International Conference on Image, Vision and Computing (ICIVC 2023)

**Dalian, China
27-29 July 2023**

Pages 1-482



**IEEE Catalog Number: CFP23G62-POD
ISBN: 979-8-3503-3524-8**

**Copyright © 2023 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP23G62-POD
ISBN (Print-On-Demand):	979-8-3503-3524-8
ISBN (Online):	979-8-3503-3523-1

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2023 8th International Conference on Image, Vision and Computing (ICIVC 2023)

Table of Contents

Preface	xv
Conference Committees	xvi

❖ Target Tracking and Algorithm

Vehicle Tracking Algorithm Based on Full Attention Mechanism	1
<i>Hong Zhu, Hui Zhou, Minghua Chen</i>	
Road Motion Vehicle Tracking Algorithm Based on Improved Camshift	7
<i>Bingqing Niu, Hongtao Wu, Ying Meng, Xiao Han, Junyi Ren</i>	
Multi-vehicle Speed Measurement Based on Monitoring Video Using Improved Multi-object Tracking Algorithm	12
<i>Xinwen Gao, Zhiyuan Gan, Zhuo Shen, Li Teng</i>	
An Autonomous Vehicle Approach Based on Improved Target Detection and Trajectory Tracking	18
<i>Ning Han, Shuai Dong, Minfeng Zhu, Shiyu Xiao, Junjie Liu</i>	
Correlation Filter Tracking Algorithm Based on Filter Space Constraint and Object Re-detection	25
<i>Yan Tian, Sixi Ren, Zhaohui Xu, Yongkang Zhang</i>	

❖ Target Detection and Model Design

Adaptive Hue Threshold for Zanthoxylum Bungeanum Fruit Detection	33
<i>Longke He, Aying Jiwa, Dan Li, Zhengcong Du</i>	
Research on Natural Scene Rice Pest Detection Method Based on YOLOv5	39
<i>Jianhui Shi</i>	
Multi-level Evidence Active Learning for Water Surface Object Detection	45
<i>Wanjun Zhong, Tianyu Han, Haohao Hu, Yuerong Wang, Li Li, Peng Zan</i>	
SF-YOLO: RGB-T Fusion Object Detection in UAV Scenes	51
<i>Shoulong Zhang, Ting Xie, Yiqi Wang, Yingying Liu, Yuling Dou, Shengke Wang</i>	
Dual Attention and Edge Refinement Network for Camouflaged Object Detection	60
<i>Bo Fan, Kuochen Cong, Wenjie Zou</i>	

Lumbar Disc Herniation Detection Based on Gait Analysis.....	66
<i>Wenlong Liang, Haojun Sun, Yahui Zhao, Zhenguo Zhang, Yuan Zong, Fei Yin</i>	
Human Target Detection Model in Dense Traffic Scenes Based on Attention Mechanism.....	72
<i>Zheng Ren, Yingqiu Li, Yujun Shen, Yanxin Xu</i>	
Analyzing Spatial Distribution Patterns of Wheat Ears.....	76
<i>Geng Xia, Zuo Changzhen, Zhao Qikun, Hao Jinyu, Wang Yongzhen, Tang Zhongzhen, Sun Xiaoyong</i>	
Attention-Based Fusion Factor to FPN for Small Object Detection.....	87
<i>Zhen Wang, Yang Zou, Qifei Wang, Jian Zhou, Huiyi Liu</i>	
Drone-YOLO: Improved YOLO for Small Object Detection in UAV.....	93
<i>Hamza Faraji, Bingcai Chen</i>	
❖ Face Recognition and Gesture Recognition	
Research on A Gesture Recognition Method of Arc Curve.....	101
<i>Yiliang Xing, Huajun Lei</i>	
Modal Fusion Sign Language Recognition Based on Swin Transformer Architecture.....	107
<i>Yujie Gao, Yadong Li, Bin Liu, Yifan Tian, Minfeng Zhu, Jian Luo</i>	
A High-Resolution Approach for Dynamic Traffic Police Gestures Recognition Based on Spatial Context and Temporal Features Fusion	114
<i>Jian He, Shengsheng Jiang, Xin Wei, Cheng Zhang, Ruihai Dong</i>	
Face Recognition Using the Improved SRGAN.....	120
<i>Yan Zhao, Chunlong Yao, Xu Li, Lan Shen</i>	
Review of Cross-Age Face Recognition in Discriminative Models.....	124
<i>Liu Ermao, Zhi Min</i>	
Person Re-identification based on Multi-spectrum Information Aggregation Transformers.....	131
<i>Yuxuan Zhang, Huibin Tan, Long Lan, Jing Ren, Xiao Teng</i>	
Facial Expression Recognition Based on An Improved Data Augmentation Method and A Multichannel Convolutional Neural Network Model.....	136
<i>Xiuling Wang, Xiao Lu, Yingying Wang, Haixia Wang, Zhiguo Zhang</i>	
❖ Defect/Anomaly Detection and Algorithms	
Ship Detection in Maritime Surveillance System Based on YOLOX	146
<i>Yang Ransheng, Hu Ying, Zhang Hongfei</i>	
A Method for Detecting Road Spills under the Constraint of Short Term-Long Term Dual Background Model	154
<i>Ying Meng, Hongtao Wu, Bingqing Niu, Junyi Ren, Mingshu Shen</i>	

Road Defect Detection Based on Dual-Scale Wavelet Transform	160
<i>Yuheng Shen, Yihai Wei, Zouzhou Jiang, Rui Ding</i>	
A Leak Detection Method for Heat Network Pipes Based on YOLOv5 and Automatic Region Growing Algorithm	166
<i>Zhiqian Li, Shuai Kong, Ping Tang, Jiansheng Hu, Jiayan Chen, Qiang Wang</i>	
Monitoring Effluent Water Quality in Wastewater Treatment Process Based on Multi-model Online Soft Sensing Method	172
<i>Zhaozhao Zhang, Juan Wu, Lei Yang, Yingqin Zhu</i>	
PCB Defect Detection Algorithm of Improved YOLOv8	178
<i>Hong Lan, Huasheng Zhu, Rui Luo, Qiaofeng Ren, Cong Chen</i>	
Cigarette Authentication by Using Deep Learning-Based Anomaly Detection of Adhesive Mark Images	184
<i>Zhouyuan Liang, Dan Li, Bingbing He, Zeping Chen, Ningtao Zhang, Yufeng Zhang</i>	
Fusion and Inpainting: A Novel Salient Object Detection Network	189
<i>Yongli Lin, Yang Lu, Zhiyang Li, Zhaobin Liu, Weijing Liu</i>	
Surface Defect Detection Method for Steel Materials Based on Improved YOLOv7	194
<i>ShuYuan Luo, Bin Jia, Jun Zhao, QingSong Niu</i>	
Enhancing Road Pothole Detection Algorithm of YOLOv5	200
<i>Hongpeng Tian, Miao Zhang</i>	
JADE OWL: JPEG 2000 Forensics by Wavelet Offset Consistency Analysis	206
<i>Quentin Bammey</i>	
Few-Shot Steel Defect Detection Method Based on Improved Meta-Learning Model.....	213
<i>Fengkai Luo, Ruirui Ji, Kehao Deng, Qiliang Sha</i>	
❖ Image Denoising and Image Analysis	
Hierarchical Dilated Graph Convolutional Network for Point Cloud Analysis	219
<i>Anshun Xue, Chen Li, Chongkun Xia, Houde Liu, Bin Liang</i>	
Lightweight Human Pose Estimation with Attention Mechanism	227
<i>Fangrui Han, Meng Dai, XiaoWei Chen</i>	
SALiCLIP: Generating Speech-Conditioned Images by Aligning Speech with CLIP Latents.....	231
<i>Prajwal Gupta C.R., Vishisht Srihari Rao, Rithvik G, R.L. Sameeksha, Badri Prasad V.R.</i>	
Missing-Modal Face Anti-Spoofing: A Benchmark	239
<i>Xuan Li, Chen Li, Jia Hu</i>	
Dual-branch Contrastive Learning for Image Enhancement of Underwater Internet of Things	245
<i>Yifan Xiang, Zhikui Chen</i>	

Study of the Weighted Chan-Kalman Fusion Algorithm under Heterogeneous Conditions	251
<i>Junjun Tian, Xiaoqiang Yu, Taiya Wang, Tengpeng Cheng</i>	
AT-CycleGAN: Historical Tibetan Document Characters Generation Using Attention and Triplet Loss's CycleGAN.....	256
<i>Yueyang Yu, Weilan Wang, Leer Mao, Qiaoqiao Li</i>	
Fast Pre-training Kernel Estimation Network for ISAR Space Target Image Deblurring.....	262
<i>Mingyao Chen, Zhixiong Yang, Huaizhang Liao, Jingyuan Xia, Tianpeng Liu, Li Liu</i>	
A Self-Supervised Denoising Method for pCLE Images	268
<i>Kun Yang, Haojie Zhang, Zhiguo Zhang, Qingge Sang, Tong Zhai, Yufei Qiu</i>	
An Autocorrelation Function-Based Method Used for Image Denoising with Accuracy and Efficiency	273
<i>Shengnan Zuo, Chenguang Cai, Zhihua Liu, Ming Yang, Haihui Huang, Huinan Gong</i>	
A Two-Step Algorithm for Denoising Peach Tree Leaf Images.....	277
<i>Haixin Wang, Chunxian Chen</i>	
❖ Image Classification	
Radar Target Recognition and Classification Based on Preprocessing and Improved DenseNet.....	286
<i>Yue Geng, Jun Zhang, Zhuo Li, Yan Zhou</i>	
Learning Class-Aware Prototypical Representations for Few-Shot Learning	291
<i>Xiaoying Chen, Weijie Ye</i>	
A Non-invasive Computer-Based Pomelo Grade Classifier Using Multiclass Support Vector Machine	297
<i>Kim Ravida, Ramon Garcia</i>	
An Efficient CNN-BiLSTM-Based Model for Multi-class Intracranial Hemorrhage Classification.....	303
<i>Kevin Genereux, Thangarajah Akilan</i>	
Detection and Classification of Pole-Like Landmarks for Domain-Invariant 3D Point Cloud Map Matching	310
<i>Sun Yifei, Li Dingrui, Ye Minying, Tanaka Kanji</i>	
❖ Image Segmentation	
DeMerge Transformer: A Learnable Decoder for Near-infrared Blurred Vessel Segmentation with Domain Adaptation	315
<i>Jiazhe Wang, Yoshie Osamu, Koichi Shimizu</i>	
ASAHmap: An Adaptive Chinese Handwritten Character Segmentation Algorithm for Large-Scale Ancient Handwritten Document Based on Histogram Projection and Gaussian Kernel Convolution Map.....	322
<i>Ruiyang Song, Fuhao Guo, Yunchang Wang, Hongqi Han, Jishou Ruan, Cihan Ruan</i>	

An Image Segmentation Method Based on Transformer and Multi-scale Feature Fusion for UAV Marine Environment Monitoring	328
<i>Yingying Liu, Fengqin Yao, Laihui Ding, Zhiwei Xu, Xiaogang Yang, Shengke Wang</i>	
A Novel Self-Adaptive Vehicle Segmentation Method in Traffic Video with Symmetric Frame Difference Constraints	337
<i>Hongtao Wu, Ying Meng, Bingqing Niu, Junyi Ren, Mingshu Shen</i>	
SkyCloud: Neural Network-Based Sky and Cloud Segmentation from Natural Images	343
<i>Christoph Gerhardt, Florian Weidner, Wolfgang Broll</i>	
MADA: Multi-level Alignment in Domain Adaptation Network for Nighttime Semantic Segmentation	352
<i>Mengfan Xu, Wei Huang, Rui Huang</i>	
Panoptic Segmentation for Seasonal River Scene Based on Spatial Context Prior and DenseASPP.....	358
<i>Yiqi Wang, Ning Liu, Laihui Ding, Zhiwei Xu, Xiaogang Yang, Shengke Wang</i>	
Gaussian Transformer and CNN Segmentation Method Based on Contrastive Learning of Boundary	368
<i>Pan Pan, Yanfeng Li, Houjin Chen, Xuzhi Zhao, Luyifu Chen, Chong Zhang</i>	
❖ Super Resolution Image and Image Quality Assessment	
FPGA-Based Implementation of the Quantized Neural Network for Image Super-Resolution	374
<i>Zhihao Ruan, Shanzhu Xiao, Qiuqun Deng, Huamin Tao, Jiadong Wu, Huan Zhang</i>	
Image Super-Resolution Algorithm Based UAV Forensics Method.....	380
<i>Liwen Peng</i>	
Deep Learning-Based Scene Text Image Super-Resolution Methods: A Survey.....	384
<i>Shuo Jiang, Bo Ning, Yunpeng Wang, Haocheng Zhang, Yingying Diao, Peize Yang</i>	
Research on Efficient Pyramid Attention Back-Projection Network for Medical Image Super-Resolution ...	390
<i>Xiqiao Jing, Bin Wu</i>	
Hybrid Coefficient Fusion in Multi-resolution Singular Value Decomposition Domain for Medical Images...	397
<i>Zihua Jin, Kangjian He, Dan Xu</i>	
❖ Image Detection Method and Application	
A Bolt Rust Detection System for Smart Construction Sites.....	403
<i>Yu Sun, Linxiao Zheng, Zijun Lu, Qiufang Lian, Lin Zhou</i>	
U-shaped Parts Grasping Detection Method Based on Rotated-Yolov5.....	409
<i>He Cui</i>	
Eye State Detection Based on EAR and HOG PSO-Support Vector Machine	414
<i>Liang Chen, Wei Zheng</i>	

Safety Helmet Wearing Detection Based on Particle Swarm Optimization YOLOv7	419
<i>Ziteng Zhang</i>	
Vehicle-Infrastructure Cooperative 3D Detection via Point Cloud Filtering	424
<i>Wenchao Yan, Hua Cao, Jiazhong Chen</i>	
A Vehicle Detection Method Based on the Decision-Level Fusion of LiDAR and Camera	432
<i>Hao Luo, Hao Li, Yimou Chen, Miaohang Su</i>	
❖ Medical Image Processing and Imaging Analysis	
Palm Vein Imaging Enhancement in Highly Reflective Hand Scenarios	438
<i>Shiyou Sun, Zheng'ao Wang, Fanglin Chen, Kai Xia</i>	
How to Explore the CV Screening Spatial Location: Towards an Eye Movement Experiment	443
<i>Liangliang Ma, Xiaomeng Qu, Shu Yu</i>	
Edge-Enhanced Dense Network Based on Attention for Low-Dose CT Denoising	449
<i>Lei Zhang, Jianshe Xiong, Yuezhong Zhou</i>	
Multimodal U-Net Breast Cancer Tumor Algorithm Based on Radio Frequency (RF) Data and Ultrasound Images	455
<i>Zeping Chen, Bingbing He, Zhouyuan Liang, Hong Tang, Yangchen Fu, Yufeng Zhang</i>	
Automated Fundus Image Standardization Using a Dynamic Global Foreground Threshold Algorithm	460
<i>Riley Kiefer, Muhammad Abid, Mahsa Raeisi Ardali, Jessica Steen, Ehsan Amjadian</i>	
❖ Satellite Image Monitoring and Digital Remote Sensing Imaging Technology	
A New Approach of Combined Block Adjustment of Multi-source Satellite Images Based on Existing DOM and DSM	466
<i>Liting Dong, Li Guo, Xia Wang, Mingyu Yue, Pengfei Huang, Chuanjie Yu</i>	
Man-Made Target Extraction Based on Multi-aspect SAR Images	472
<i>Jia Zhao, Daoxiang An, Leping Chen</i>	
Delineation of Surface Water Bodies from SAR Imagery Based on Improved MRF and CNN Model	478
<i>Cong Xie, Xin Zhang, Xianyi Zhang, Shijian Shen, Long Zhuang, Kun Chen</i>	
A Comprehensive Accuracy Verification Method Based on the Block Adjustment Results of GF-7 Stereo Images	483
<i>Jiaying Liu, Xia Wang, Li Guo, Ying Chen, Limin Shan, Chuanjie Yu</i>	
A New Raw Holographic Image Simulator and Data Generation	489
<i>Bodor Almatrouk, Hongying Meng, Akuha Aondoakaa, Rafiq Swash</i>	
Gated Fusion and Dual Attention Network for Road Extraction from Satellite Imagery	495
<i>Haijuan Wang, Lin Bai, Bo Ji, Jiaming Shen, Ying Jin, Fei Ye, Chunlin Zhu</i>	

An Improved Space-Varying Wiener Range Prefilter Algorithm	501
<i>Lufu Xia, Dong Feng, Jianpeng Li, Daoxiang An, Zhimin Zhou</i>	
Surface Subsidence Monitoring in Jinan City Based on SBAS-InSAR Technology	507
<i>Dingyi Jiang, Geiwei Tan, Zhiying Zheng</i>	
Aerial Image Stitching Using IMU Data from a UAV	513
<i>Selim Ahmet IZ, Mustafa UNEL</i>	
❖ Digital Optical Imaging System and 3D Reconstruction Technology	
Fast 3D Reconstruction of Power Transmission Lines Based on Sequential Images	519
<i>Xinyan Qin, Yuje Zeng, Jin Lei, Bo Li, Jie Zhang</i>	
An Automatic Focusing Method for Cell Holographic Images in Microfluidic Lensless Imaging Systems	525
<i>Jihui Yu, Ningmei Yu, Dian Tian, Jinzhou Hu, Xinjie Xu, Yuanhui Zhang</i>	
Elemental Images Labelling and Grouping to Minimise Disparity Error in Texture-Less Regions of Holoscopic Images	531
<i>Bodor Almatrouk, Hongying Meng, Rafiq Swash</i>	
Few-Cell Culture Monitoring and Analysis in Real-Time Using the Lensless Imaging System.....	537
<i>Jinzhou Hu, Ningmei Yu, Dian Tian, Jihui Yu, Xucheng Liu, Yichen Di</i>	
Reversible Data Hiding Based on Bidirectional Histogram Modification for 3D Mesh Models	543
<i>Qilong Zhang, Xiaoying Song</i>	
A Build-in Pseudo-Event Driven Readout Circuit for 3D dToF Image Sensor	548
<i>Xin Sun, Jingyi Zhao, Cheng Mao, Hu Yan, Hongcun He, Xiangshun Kong</i>	
A Time-Related Voxel Representation Method for Event Camera	553
<i>Ruilin Wang, Li Wang, Yingbo He</i>	
Shape Retention Based 3D Point Cloud Reconstruction from a Single Image.....	558
<i>Ning Wang, Li Liu, Huaxiang Zhang, Jing Guo, Dongmei Liu, Hongzhen Li</i>	
Single Image Super-Resolution Reconstruction Technique with Lightweight Dual-Branch Network.....	565
<i>Ruixiong Gu, Zhijun Shen, Junjie Chen</i>	
Research on Image Reconstruction Method Based on Generative Adversarial Network.....	572
<i>Zheng Li, Liqing Wang</i>	
❖ Computer Vision and Visualization System	
A Review of Attention Mechanisms in Computer Vision	577
<i>Qi Xuanhao, Zhi Min</i>	

Vision-Based System Identification of a Quadrotor	584
<i>Selim Ahmet IZ, Mustafa UNEL</i>	
VGGAN: Visual Grounding GAN Using Panoptic Transformers.....	591
<i>Fengnan Quan, Bo Lang</i>	
Copyright Protection Scheme for QR Codes under Unextended Visual Cryptography	598
<i>Jiaqi Sun, Lina Zhang, Qingpeng Chen, Jing Zhang</i>	
Quantifying the Impact of Myopia on Visual Perception in Children through Eye Tracking	607
<i>Xi Liu, Xiangyu Yan, Jialu You, Yuqi Wang, Ruochen Dang, Bingliang Hu, Le Zhang, Quan Wang</i>	
Application of Computer Vision 3D Imaging Sensing Technology in GIS High-Voltage Power Bushing Gas Composition Detection and Its Device Development.....	613
<i>Zhang Shiling</i>	
3D Printing Technology Support the Creative Design of Traditional Stationery Structures.....	621
<i>Bo Du, Yukari Nagai, Yuxuan Guo, Manqian Wang</i>	
Comfort Improvement of Stereoscopic Video Based on Disparity Adjustment	628
<i>Wei Quan, Jia Song, Cheng Han, Jingjing Liu, Shanshan Qi, Hongkai Sun</i>	
An Improved YOLOX Loss Function Applied to Maritime Video Surveillance.....	633
<i>Haowei Shi, Ying Hu, Hongfei Zhang</i>	
❖ Virtual Technology and Computer Digital Drawing Technology	
Virtual Viewpoint Rendering Method Based on Multi-threshold Layering	639
<i>Jiahe Wang, Jiayue Liu</i>	
Virtual Reality for Historical Education: Designing an Immersive and Interactive Platform for 3D Digital Heritage and Dynamic Storytelling.....	645
<i>Zijie Zhou, Ho Yan Kwan, Yongkang Xing, Guokai Feng, Tiande Xie, Shaoyu Zhang</i>	
A Survey of GNN-Based Graph Similarity Learning	650
<i>Nan Jiang, Bo Ning, Jingyang Dong</i>	
Image-Based Particulate Matter Pollution Analysis Using A Lightweight Autoencoder.....	655
<i>Xulong Zhang, Deepak Shrestha, Afsana Khan, Jing Zhang</i>	
Design of Product Characteristics 3D Model Display System Based on Digital Earth.....	660
<i>Xiangzhen Li, Yanqing Xia, Hongcheng Yin, Yang Zhang, Shuai Liu, Xichen Wu, Xiaodan Xie</i>	
❖ Intelligent Image Recognition Technology and Applications	
Leaf Recognition Using K-Nearest Neighbors Algorithm with Zernike Moments	665
<i>Zhuohao Jia, Simon Liao</i>	

Recognition of Abnormal Behaviors of Elevator Passengers Based on Temporal Shift and Time Reinforcement Module	670
<i>Zhiheng Wang, Zheng Shen, Jiayan Chen, Junning Li, Wenxiang Wu</i>	
TAR: A Dataset of Teacher-Teaching Action Recognition	676
<i>Jingyu Jia, Jingze Song, Qifeng Hu, Shulei Tang, Shenghua Xu</i>	
Identification of Child Physical Abuse Based on Openpose and ST-GCN	682
<i>Yanhui Huang, Zongtao Zhang, Zhihong Zhao, Zhuofeng Chen, Kaichen Zeng, Yanyan Li</i>	
Flower Recognition Based on an Improved Convolutional Neural Network MobileNetV3	688
<i>Ren Yanbiao, Liu Jinghe, Xue Yan, Xia Fei, Guo Xiaoli, Xu Long, Gao Yuanyuan</i>	
Vehicle Re-identification for Intelligent Transport System Using DOLGNet Attention Model	693
<i>S M Injamamul Haque Masum, Md. Naim Sheikh, Mim Rahman, Mohammad Shohidul Islam, Md Atiqul Islam, Sultana Easmin Siddika</i>	
Research on Image Recognition of Coal and Gangue Based on Improved ResNet	699
<i>Liao Fang, Zhenguan Cao, Rui Li, Xun Yang</i>	
Recognizing Train Brake Shoes Based on the Improved OCRNet	705
<i>Chengli Zhong</i>	
Text Detection and Recognition from Piping and Instrumentation Diagrams	711
<i>Amir Saba, Rim Hantach, Mohammed Benslimane</i>	
HABFD: Houma Alliance Book Facsimiles Database	717
<i>Zhibo Zhang, Xiaohua Huang, Xiaoyu Yuan, Yabo Sun</i>	
Identification of Abnormal Behavior in Electric Power Operations Using the Human Skeleton's Key Features	723
<i>Yang Zhou, Xingjian Wang, Guoqiang Hu, Yong Luo, Zheng Chai, Wei Xu, Qiuming Liu</i>	
❖ AI-Based Digital Image Analysis and Processing Technology	
Innovative Research on the Prevention Path of Athletic Injuries under Digital Technology	730
<i>Miaowen Lei, Fang Chen</i>	
Region-Aware Multiscale Aggregation Networks for Crowd Counting	735
<i>LiangJun Huang, GuangKai Chen, ShiHui Shen, LuNing Zhu, WenCan Kang, Qing Zhang</i>	
A Two-Branch Framework for Monocular Depth Estimation	741
<i>Dazheng Zhou, Mingliang Zhang, Bin Li</i>	
Image Caption Method with Verb-Specific Scene Graph Decomposition	750
<i>Bingrui Chen, Yingchi Mao, Jinlei Jiang, Jiahong Sui, Rongzhi Qi, Zicheng Wang</i>	

Fractal Image Encoding Based on Minimum Iterated Function System.....	756
<i>Wang Qiang</i>	
Multi-scale Enhancement and Sharpening Method for Visible Light Images in Underground Coal Mines...	761
<i>Cong Li, Tong Zheng, Shunan Li, Chongchong Yu, Yonggang Gong</i>	
An Intrusive Strong Shock Overload Measurement Method Based on High Speed Image Acquisition and Processing.....	771
<i>Qi Tao Liu, Xiao Kui Yue, Hong Xiao Chao, Qiang Lei</i>	
Electrical Fittings Inspection Based on Improved Unet with Generative Adversarial Network and Attention Mechanism	776
<i>Zhihui Xie, Min Fu, Xuefeng Liu</i>	
❖ Machine Learning Model and Data Calculation	
UAVS Task Assignment Based on Hybrid Swarm Intelligence Algorithm.....	783
<i>De-ping Yuan</i>	
A Hybrid CNN-LSTM Model for Video-Based Teaching Style Evaluation	789
<i>Aohua Song, Ludi Bai, Qingyun Xiong, Junqi Guo</i>	
Damage Diagnosis of Railway Wheelset Using Artificial Intelligence Network	796
<i>Zhenyang Tian, Dongtai Li, Jie Zhang</i>	
QoS to QoE Mapping Based on Optimised BP Neural Networks.....	801
<i>Ruicheng Wu, Shufeng Li, Xiaohan Zhang, Wenting Gao</i>	
Universally Strict Black-Box Attacks against Deep Neural Networks	807
<i>Zhengzhi Lu, Guoan Yang</i>	
A Co-evolutionary Genetic Algorithm Based on Improved K-means Clustering.....	813
<i>Wenxin Xia, Lianshuan Shi, Rui Zhang, Jiale Zhang, Jiaying Zhao</i>	
A Review of Knowledge-Grounded Dialogue Systems.....	819
<i>Ming Wang, Bo Ning, Bin Zhao</i>	
Evaluation of Bus Driving Behavior Based on Vehicle Location Data	825
<i>Linliang Zhang, Hongtao Wu, Kaichao Cui</i>	
SSP: A Large-Scale Semi-Real Dataset for Semantic Segmentation of Spacecraft Payloads.....	831
<i>Yanning Guo, Zhen Feng, Bin Song, Xinglong Li</i>	
Research on the Database Model Supporting the Setting and Sharing of Data Security Levels in Ubiquitous Smart Learning Spaces.....	837
<i>Song Lei, Ren Shuaitao, Zhou Hua</i>	

Broad Learning System Based on Triangular Fuzzy Membership Function	842
<i>Mengying Jiang, Wenxia Zhang, Huisheng Zhang</i>	
Fuzzy Control Strategy for Energy Allocation Optimization in Extended Range Mode	847
<i>Wang Jianling, Yu Xian, Liu Nan, Cheng Detong</i>	
❖ Digital Signal Measurement and Analysis	
Noise Benefits in Complex-Valued Neural Networks	853
<i>Lei Ren, Chunyang Liu, Ying Zhang</i>	
Research on Time Difference Measurement Technology Based on Cross Correlation	859
<i>HanWei Zhang</i>	
Wireless Network Coverage and Visualization Model for Ship Random Communication	864
<i>Meng-en Song, Ze Xie, JingBo Zhang, ZhouHua Peng, Qing Hu</i>	
Improved Residual Cumulative Resampling PF-PHD Filter Based on Stratified Rough Sorting	874
<i>Huan Zhang, Huamin Tao, Xinglin Shen, Luping Zhang, Zhihao Ruan</i>	
Mosaic Multi-spectral Sensor Control and Drive System Design	880
<i>Yongfei Huang, Min Huang, Lulu Qian, Zhanchao Wang, Wenhao Zhao, Zixuan Zhang</i>	
BDS Availability Calculation and Visual Display Based on Monitoring Data	886
<i>Xiaowen Sun, Tongtong Han, Zheng Gong, Shuaiheng Huai, Qing Hu</i>	
❖ Feature Extraction and Image Fusion	
A Mini-Mega Transformer for Image Fusion and Applications	892
<i>Shuwen He, Xiaotian Zhang, Yong Liu, Wei Zhong</i>	
A Spatio-Temporal Interactive Network Based Sobel Guided Optical Flow for Facial Depression Analysis	902
<i>Min Shi, Xu Qiao, Rui Gao</i>	
Ultrasonic Thyroid Nodule Benign-Malignant Classification with Multi-level Features Fusions	907
<i>Xin Zhao, Hongdou Li, Jianwei Xu, Jialing Wu</i>	
MMST-GCN+: A Multi-modal ST-GCN+ for Computer-Aided Education by Introducing a Sensor Skeleton	913
<i>Ziyun Zhao, Aohua Song, Qingyun Xiong, Siyu Zheng, Junqi Guo</i>	
Progressive Feature Fusing for High-Resolution Image Inpainting	923
<i>Shuaifei Wang, Meijuan Wang, Zhiyang Li, Jun Zhou, Zhaobin Liu</i>	
Accurate Classroom Person Detection Based on Multi-frame Feature Fusion with Attention	928
<i>Guoan Cheng, Jiandong Ren, Yuping Li, Shengke Wang, Yougang Ding, Hao Wang</i>	

Hybrid Inverse Mapping Algorithm Based on Residual Iteration	936
<i>Wei Wei, Xinyu Zhou</i>	
Employing Deep Learning Framework to Support Location Management for the Audio-Visual Industry	942
<i>M. Loufakis, P. Symeonidis, S. Fontalis, D. Ioannidis, D. Tzovaras</i>	
Fast Fusion of Multi-modality Images Based on Regional Accumulated Gradient Contrast.....	948
<i>Lixia Zhang, Zhaocheng Xuan</i>	
Ear Detection and Extraction Using a Developed Features Descriptor and Geometric Transformation	954
<i>Ammar A. Altameemi, Alaa Hussein Abed, Ammar D. Jasim</i>	

Author Index