2021 International Symposium on Computer Technology and Information Science (ISCTIS 2021)

Guilin, China
4-6 June 2021

IEEE Catalog Number: CFP21Y44-POD
ISBN: 978-1-6654-1442-5

Copyright © 2021 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: CFP21Y44-POD
ISBN (Print-On-Demand): 978-1-6654-1442-5
ISBN (Online): 978-1-6654-1441-8

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

2021 International Symposium on Computer Technology and Information Science (ISCTIS)

ISCTIS 2021

Table of Contents

Preface ..... **xvi**
Committee Members ..... **xvii**
Reviewers ..... **xviii**

Computer Technology and Big Data Algorithm Application

Safety Evaluation of Track Engineering and GIS Management System in Computer Environment 1
Meng Li (Wuhan University of Science and Technology) and Han Yang (Wuhan University of Science and Technology)

Research on Control of Computer Room Personnel Based on OpenCV 6
Wenzhi Wu (Xiamen University of Technology, China) and Ying Wei (Xiamen University Tan Kah Kee College, China)

The Application of Big Data Technology in the Field of Ethnology 10
Beibei Tang (JiangXi Science & Technology Normal Univesity, China) and Fei Ren (JiangXi Science & Technology Normal Univesity, China)

Research on risk analysis of pedestrian and vehicle flow in community scenes based on machine vision 14
Ranpeng Wang (Tsinghua University, China), Yi Liu (Tsinghua University, China), Yudong Zhang (Tsinghua University, China), and Jing Qian (Tsinghua University, China)

Improved Genetic Algorithm for Weapon Target Assignment Problem 19
Luo Ruining (Air Force Engineering Universityline, China) and Zhao Yan (Air Force Engineering Universityline, China)

Vulnerability Detection Algorithm of Lightweight Linux Internet of Things Application with Symbolic Execution Method 24
Hongrui Li (Linyi University, China), Lili Zhou (Sultan Idris Education University; Shandong Deheng Human Resources Co., Ltd., China), Mingming Xing (Linyi University, China), and Hafsah Binti Taha (Sultan Idris Education University)

Research on Filling Algorithm of Incomplete Data in North Interface of Optical Fiber Network 28
Yang Dewei (National University of Defense Technology, Peoples R China), Ran Jinzhi (National University of Defense Technology, Peoples R China), Shen Kuo (National University of Defense Technology, Peoples R China), Zhou Xingfu (National University of Defense Technology, Peoples R China), Huang Bin (National University of Defense Technology, Peoples R China), Zhao Weihu (National University of Defense Technology, Peoples R China), and Lin Chushan (National University of Defense Technology, Peoples R China)

Broadband Near-Field Direction Finding Algorithm Based on Subband Power Weighting 32
Zepeng Yang (Xi 'an Branch of China Academy of Space Technology, China), Hu Xie (Xi 'an Branch of China Academy of Space Technology, China), and Xiaomin Tan (Xi 'an Branch of China Academy of Space Technology, China)

Research on Interactive Design of Tourism Brand Based on Augmented Reality Technology 36
Guo Juan (Wuhan University of Technology, China) and Huang Xiaoli (Xiamen University Tan Kah Kee College, China)

Design and Research of Device Application Software Robot Based on Windows Platform 40
Jianglai Xu (Beijing space information relay transmissiontechnology research center, China) and Jun Zheng (Beijing space information relay transmissiontechnology research center, China)

DOA Estimation Method Based On Improved Variable-Step-Size LMS Algorithm 46
Yongfeng Qin (Guilin University of Electronic Technology, China), Simin Li (Guangxi University of Science and Technology, China), and Zhiling Tang (Guilin University of Electronic Technology, China)

Research on UWB/BLE-based Fusion Indoor Positioning Algorithm and System Application 50
Jingbo Xia (Xiamen University Tan Kah Kee College, China), Shiyan Li (Xiamen University, China), Yanting Wang (Xiamen University, China), and Baoxiang Jiang (Xiamen University, China)

Long Range Wireless Alarm System Based on LoRa and TOF LiDAR 55
Weifeng Wu (Xiamen University Tan Kah Kee College, China) and Fengying Huang (Xiamen University Tan Kah Kee College, China)

Stored Grain Pests Monitoring System Based on Raspberry Pi 59
Xu Tian-xing (Xiamen University Tan Kah Kee College, China) and Huang Feng-ying (Xiamen University Tan Kah Kee College, China)

Analog Circuit Fault Diagnosis Based on Optimization Matrix Random Forest Algorithm 63
Huang Shunmei (Guilin University of Electronic Technology, China), Tan Enmin (Guilin University of Electronic Technology, China), and Ruan Jimin (Guilin University of Electronic Technology, China)

Classification of Abnormal Behavior in the Elderly Based on Wi-Fi 68
Wang Weiqiong (Northwest Minzu University, China), Cao Yongchun (Northwest Minzu University, China), Lin Qiang (Northwest Minzu University, China), and Li Yifan (Northwest Minzu University, China)

Research on the Digital Design Method for Core Module Functional Verification Platform 73
YanXia Gao (Tianjin Aerospace Electromechanical Equipment Research Institute, China), Peng Wei (Tianjin Aerospace Electromechanical Equipment Research Institute, China), Xing Jia (Tianjin Aerospace Electromechanical Equipment Research Institute, China), and Chen Cao (Tianjin Aerospace Electromechanical Equipment Research Institute, China)

Automatic Grasping of 3-DOF Robotic arm Based on Visual Feedback 79
Yuming Li (Guilin University of Electronic Technology, China), Qi Zhang (Guilin University of Electronic Technology, China), Xiao Li (Guilin University of Electronic Technology, China), Ziyi Li (Guilin University of Electronic Technology, China), and Xiwei Zhang (Guilin University of Electronic Technology, China)

Super-Resolution Algorithm Combining SAE Dictionary Learning and Anchored Neighborhood Regression 86
Huang Weiqin (Xiamen University Tan Kah Kee College, China), Guo Yijing (Xiamen University Tan Kah Kee College, China), and Chen Junren (Xiamen University Tan Kah Kee College, China)

Fruit Ripeness Detection Based on Miniature Spectral Sensor 93
Yvhan Jiao (Guilin University of Electronic Science and Technology, China), Qi Zhang (Guilin University of Electronic Science and Technology, China), Xinyao Luo (Guilin University of Electronic Science and Technology, China), and Zhaohua Liang (Guilin University of Electronic Science and Technology, China)

Parent-Based Powershell Script Fusion Technology 99
Sipeng Cheng (State Key Laboratory of Mathematical Engineering and Advanced Computing, China), Zihan Sha (State Key Laboratory of Mathematical Engineering and Advanced Computing, China), Pu Yu (State Key Laboratory of Mathematical Engineering and Advanced Computing, China), Wenjuan Bu (State Key Laboratory of Mathematical Engineering and Advanced Computing, China), and Guoyu Huo (State Key Laboratory of Mathematical Engineering and Advanced Computing)

Softmax Regression and Particle Swarm Optimization with Taboos and a Heuristic Strategy for Dose-Effect Data Fitting 106
Mingfeng Zhu (Jiangxi University of Chinese Medicine, China), Yan He (Jiangxi University of Chinese Medicine, China), Jianqiang Du (Jiangxi University of Chinese Medicine, China), Bin Nie (Jiangxi University of Chinese Medicine, China), Qin Yang (Jiangxi University of Chinese Medicine, China), and Riyue Yu (Jiangxi University of Chinese Medicine, China)

A Jamming Situation Generation Method for Space-Air Network Based on Newton's Law of Cooling 111
Hao Lu (Beijing Space Information Relay Transmission Technology Research Center; Beijing Aerospace Control Center, China), Leiping Xi (Army Engineering University, China), Donghao Zhao (Army Engineering University, China), Qiong Li (Zhonglou Town Central School, China), and Zhiwei Li (Army Engineering University, China)

Chinese Position Segmentation Based on ALBERT-BiGRU-CRF Model 116
XiaoLin Li (Wuhan University of Technology, China) and QingKang Deng (Wuhan University of Technology, China)

Research on PowerShell Obfuscation Technology Based on Abstract Syntax Tree Transformation... 121
XiaoMeng Xu (Information Engineering University, China), ShuWen Liu (Information Engineering University, China), Pu Yu (Information Engineering University, China), and YunTian Zhao (Information Engineering University, China)

DOA Estimation of a Novel Three-Level Nested Array with Enhanced DOF 126
Yule Zhang (Air Force Engineering University, China), Guoping Hu (Air Force Engineering University, China), Chen Chen (Air Force Engineering University, China), Baodai Shi (Air Force Engineering University, China), Jiaqiang Peng (Air Force Engineering University, China), and Weijie Zhong (Air Force Engineering University, China)

A Novel sub ADC Architecture for Time Interleaved 130
Weikun Cai (National University of Defense Technology, China) and Chunwu Liu (National University of Defense Technology, China)

A Dual-Band PA for Counter UAV Applications 134
Qingchao Xiao (Fujian University of Technology, China), Liwen Chen (Fujian University of Technology, China), Wei Lu (Fujian University of Technology, China), and Cheng Zhu (Fujian University of Technology, China)

How Intelligent Technology Affects Education—— Case-Based Research 138
Zhang Kaili (Xiamen University Tan Kah Kee College, China) and He Jiajin (Xiamen University Tan Kah Kee College, China)

Technical Scheme Design Of Provincial Technology Platform for County-Level Convergence Media Center 142
He Jiajin (Xiamen University Tan Kah Kee College, China) and Zhang Xi (Fujian Broadcasting Network Group Fuzhou Branch, China)

Grey Theory Based Model Applied in Carbon Emissions Prediction for The Chengdu-Chongqing Twin Cities Economic Zone 146
Kun Wang (Chongqing University of Posts and Telecommunications, China) and Ling Xiao (Chongqing University of Posts and Telecommunications, China)

51 World's Earth Cloning Project 4: Connotation, Challenges and Applications of the Next Generation Digital Twin Platform 150
Zhixin Fang (Xiamen University Tan Kah Kee College, China) and Zheng Yuchen (Minnan Normal University, China)

MetaHuman Creator: The Starting Point of the Metaverse 154
Zhixin Fang (Xiamen University Tan Kah Kee College, China), Libai Cai (Jimei University, China), and Gang Wang (Jimei University, China)

Auto Parts Sales Forecast Supporting Business Resource Value-Added Service 158
X Y Qin (Southwest Jiaotong University, China), C H Ren (Southwest Jiaotong University, China), and Y Yu (Southwest Jiaotong University, China)

Design Of High Flexibility Visual Search And Analysis Engine System 165
Wang Shuzhen (Xiamen University Tan Kah Kee College, China), Gao Fengqiang (Xiamen University Tan Kah Kee College, China), and Wang Li (Xiamen University Tan Kah Kee College, China)

Design and Implementation of the Monitoring System for NoSQL-Based Cloud Platform Resources 173
Xin Deng (National Meteorological Information Center, China), Nan Li (National Meteorological Information Center, China), Yuan-Ding Nie (National Meteorological Information Center, China), Biao Hou (Heilongjiang Meteorological Data Center, China), Ying-Kui Yang (Heilongjiang Meteorological Data Center, China), and Zhong-Kai Zhao (Heilongjiang Meteorological Data Center, China)

Analytical Instrument Data Format Analysis Method and Application on Marine Power System ... 178
Zhou Jianhui (China Ship Development and Design Center, China), Sun Feng (China Ship Development and Design Center, China), Shi Hao (China Ship Development and Design Center, China), and Liu Jie (Wuhan University of Technology, China)

3D Real-Scene Model of Oblique Photography Based on Retinex 182
Cheng Zhu (Fujian University of Technology, China), Liwen Chen (Fujian University of Technology, China), Wei Lu (Fujian University of Technology, China), and Qingchao Xiao (Fujian University of Technology, China)

Research on Field Routing Planning and Optimization Algorithm Based on GIS 186
Shen Kuo (National University of Defense Technology, Peoples R China), Ran Jinzhi (National University of Defense Technology, Peoples R China), Yang Dewei (National University of Defense Technology, Peoples R China), Zhou Xingfu (National University of Defense Technology, Peoples R China), and Liu Shiyuan (National University of Defense Technology, Peoples R China)

Performance Evaluation Model for Science Research Teams Based on Data Envelopment Analysis. 190
Yumin Zhou (Chongqing University of Posts and Telecommunications, China), Longyan Luo (Chongqing University of Posts and Telecommunications, China), Xingwang Yang (Chongqing University of Posts and Telecommunications, China), and Tingting Feng (Chongqing University of Posts and Telecommunications, China)

Application of BS's Knowledge Base Model in Scientific Research and Development 194
Hua Ju (Inner Mongolia Normal University, China)

Missing Data Filling Based on the Spectral Analysis and the Long Short-Term Memory Network... 198
Jie Wu (Northwest Minzu University, China), Na Li (Northwest Minzu University, China), and Yan Zhao (Northwest Minzu University, China)

Anti-Confrontational Domain Data Generation Based on Improved WGAN 203
Haibo Luo (Neusoft Institute Guangdong), Xingchi Chen (Neusoft Institute Guangdong), and Jianhu Dong (Neusoft Institute Guangdong)

Research and Practice of Program Design Ability Prediction Based on SVR 207
Fuken Zhou (Guangdong Neusoft Institute) and Liang Bin (Guangdong Neusoft Institute)

Electronic Information and Intelligent Signal Image Recognition

Information-Directed Exploration via Distributional Deep Reinforcement Learning 211
Zijie He (Cranbrook Schools)

Research on Flight Type Recognition Technology Based on Information Fusion 217
Zhigang Guo (University of Information Engineering, China), Gang Chen (University of Information Engineering, China), Yongwang Tang (University of Information Engineering, China), Han Wei (University of Information Engineering, China), Liuyang Yu (University of Information Engineering, China), and Yiwei Feng (University of Information Engineering, China)

MCSRec: Modeling Cognitive Similarity in Sequential Recommendation with Social Networks 221
Zhongwang Zhang (Fuzhou University, China), Yilei Wang (Fuzhou University, China), Xueqin Chen (Fuzhou University, China), Jifeng Ye (Fuzhou University, China), Yijin Cai (Fuzhou University, China), and Longjiang Chen (Fuzhou University, China)

Research on Frequency Allocation Scheme in Wireless Communication System 231
Zhuoqun Jin (University of Bristol, UK), Yufan Liu (Shanghai Maritime University, China), and Yuanyuan Miao (Sheffield University, UK)

Design and Application of an IC Chip Test Instrument Based on HT46RU24 235
Baosen Xiao (Xiamen University Tan Kah Kee College, China), Xiaolu Li (Xiamen University Tan Kah Kee College, China), Yuhui Lin (Fuzhou Institute of Technology, China), and Yao Zhang (Xiamen University, China)

Hand Gesture Recognition in Complex Background Based on Improved Deep Residual Learning Network 239
Chaofeng Li (Anhui University, China) and Baoping Wang (Taiyuan University of Technology, China)

Intelligent Access Control System for Granary Based on Face Recognition and Oxygen Concentration 246
Huang Feng-ying (Xiamen University Tan Kah Kee College, China), Cai Bin-jie (Xiamen University Tan Kah Kee College, China), and Xu Tian-xing (Xiamen University Tan Kah Kee College, China)

General Model-Agnostic Transfer Learning for Natural Degradation Image Enhancement 250
Xiangyu Yin (Guilin University of Electronic Technology, China) and Jun Ma (Guilin University of Electronic Technology, China)

A Weak GNSS Signal Acquisition Algorithm: Based on Stochastic Resonance 258
Tao Lu (University of Electronic Science and Technology of China, China), Yubai Li (University of Electronic Science and Technology of China, China), Fei Wang (Taidou Microelectronics Technology Company, China), Lei Mao (Taidou Microelectronics Technology Company, China), and Jun Pan (Taidou Microelectronics Technology Company, China)

A BP Neural Network Model for the Demand Forecasting of Road Freight Transportation System.. 264
Yun Wu (Qilu University of Technology (Shandong Academy of Sciences), China), Shuai Wang (Qilu University of Technology (Shandong Academy of Sciences), China), Yingying Zhang (Qilu University of Technology (Shandong Academy of Sciences), China), and Jiangzhou Zhang (Qilu University of Technology (Shandong Academy of Sciences), China)

The Simulation of Increasing Robustness of High Voltage Fast Recovery Diode used in VSC-HVDC Equipments 269
Feng He (Global Energy Interconnection Research Institute Co., Ltd, China), Yueyang Liu (Global Energy Interconnection Research Institute Co., Ltd, China), Shaohua Dong (Global Energy Interconnection Research Institute Co., Ltd, China), Cui Li (Global Energy Interconnection Research Institute Co., Ltd, China), Yaohua Wang (Global Energy Interconnection Research Institute Co., Ltd, China), Rui Jin (Global Energy Interconnection Research Institute Co., Ltd, China), and Junmin Wu (Global Energy Interconnection Research Institute Co., Ltd, China)

Research on Ship Dynamic map Based on AIS 276
Taizhi Lv (Jiangsu Maritime Institute, China), Zhiyang Song (Jiangsu Maritime Institute, China), and Chenyong He (Nanjing Huihai Transportation Technology Company Limited, China)

Wafer Maps Defect Recognition Based on Transfer Learning of Handwritten pre-Training Network 280
Shouhong Chen (Guilin University of Electronic Science and Technology, China), Yuxuan Zhang (Guilin University of Electronic Science and Technology, China), Mulan Yi (Guilin University of Electronic Science and Technology, China), Jun Ma (Guilin University of Electronic Science and Technology, China), and Xingna Hou (Guilin University of Electronic Science and Technology, China)

A Tool Wear Monitoring Method Based on WOA and KNN for Small-Deep Hole Drilling 284
Hongzhi Hu (Guilin University of Electronic Science and Technology, China), Chang Qin (Guilin University of Electronic Science and Technology, China), Fang Guan (Guilin University of Electronic Science and Technology, China), and Haitao Su (Guilin University of Electronic Science and Technology, China)

CSI Indoor Positioning Method Based on Soft Partition of Subspaces 288
Huiqing Zhang (Beijing University of Technology, China) and Yutong Wang (Beijing University of Technology, China)

A Shadow Detection Method Based on SLIC0 Superpixel Segmentation 294
Lei Kun-peng (Air Force Engineering University), Feng Xin-xi (Air Force Engineering University), and Yu Wang-sheng (Air Force Engineering University)

Design of an Intelligent Window and Research on Its Key Technology 299
Qiang Wan (Wuchang Shouyi University, China), Zheng Xiong (Wuchang Shouyi University, China), and Suhua Wang (Wuchang Shouyi University, China)

Research on Electrolytic Aluminum Pot Tending Machine Scheduling Based on Improved Greedy Algorithm 303
ChengGuo Su (University of Science and Technology Beijing, China), JiaRui Cui (University of Science and Technology Beijing, China; Guiyang Aluminum Magnesium Design and Research Institute Co., Ltd., China), XiangQuan Li (University of Science and Technology Beijing, China), Qun Yan (University of Science and Technology Beijing), Bin Cao (Guiyang Aluminum Magnesium Design and Research Institute Co., Ltd., China; Chinalco Intelligent Technology Development Co., Ltd., China), RuoYu Huang (Guiyang Aluminum Magnesium Design and Research Institute Co., Ltd., China), and Hui Lu (Guiyang Aluminum Magnesium Design and Research Institute Co., Ltd., China)

A Method of Image Enhancement in Shallow Water with Underwater System 308
Longxiang Gong (Qilu University of Technology (Shandong Academy of Sciences), China), Hao Zhang (Qilu University of Technology (Shandong Academy of Sciences), China), Xiangchun Li (Qilu University of Technology (Shandong Academy of Sciences), China), Liya Duan (Qilu University of Technology (Shandong Academy of Sciences), China), and Fei Liu (Xidian University, China)

The Effect of Dimension on Image Recognition Using Convolutional Neural Network 313
Xinyu Wan (Nanchang University, China) and Huanchen Jia (Shanghai Starriver Bilingual School, China)

Ballistic Target Signal Separation Based on Fast Independent Component Analysis Algorithm 320
Li Yuxi (Air Force Engineering University, China) and Li Peng (Air Force Engineering University, China)

Named Entity Recognition of Legal Documents Based on Cascade Model 324
Xiaolin Li (Wuhan University of Technology, China), Zhuohao Chen (Wuhan University of Technology, China), Gang Xu (Wuhan University of Technology, China), and Bowen Huang (Wuhan University of Technology, China)

Resolvable Cluster Target Tracking Based on Wavelet Coefficients and JPDA 330
Xirui Xue (Air Force Engineering University, China), Shucai Huang (Air Force Engineering University, China), Ning Li (Air Force Engineering University, China), and Weijie Zhong (Air Force Engineering University, China)

A Fast Image Encryption Based on Improved Logistic Map 337
Feng Pan (Chongqing Municipal Agriculture School, China), Chongwei Ren (Chongqing University of Posts and Telecommunications, China), Jian Gong (Chongqing University of Posts and Telecommunications, China), and Li Song (Chongqing University of Posts and Telecommunications, China)

The Normalized Weighted Capacity Criterion Based Antenna Design for 5G-HAP Cellular Systems 341
Chaoxian Zhang (Xiamen University Tan Kah Kee College, P. R. China) and Ping Wu (Xiamen University Tan Kah Kee College, P. R. China)

A Research on Face Recognition Open Source Development Framework Based on PyTorch 346
Xinghan Huang (Xiamen University Tan Kah Kee College, China), Xiaofu Du (Xiamen University Tan Kah Kee College, China), Hedan Liu (Xiamen University Tan Kah Kee College, China), and Wenkai Zang (Xiamen University Tan Kah Kee College, China)

A Charge Density Model of Silicon-Nanowire GAA MOSFET Incoroperating the Source-Drian Tunneling Effect for IC Design 351
He Cheng (Chinese Academy of Sciences, China; Shenyang Institute of Automation, Chinese Academy of Sciences, China; Institutes for Robotics and Intelligent Manufacturing, Chinese Academy of Sciences, China), Chao Zhang (Chinese Academy of Sciences, China; Shenyang Institute of Automation, Chinese Academy of Sciences, China; Institutes for Robotics and Intelligent Manufacturing, Chinese Academy of Sciences, China), Tiefeng Liu (Chinese Academy of Sciences, China; Shenyang Institute of Automation, Chinese Academy of Sciences, China; Institutes for Robotics and Intelligent Manufacturing, Chinese Academy of Sciences, China), Chuang Xie (Chinese Academy of Sciences, China; Shenyang Institute of Automation, Chinese Academy of Sciences, China; Institutes for Robotics and Intelligent Manufacturing, Chinese Academy of Sciences, China), Zhjia Yang (Chinese Academy of Sciences, China; Shenyang Institute of Automation, Chinese Academy of Sciences, China; Institutes for Robotics and Intelligent Manufacturing, Chinese Academy of Sciences, China), and Zhipeng Zhang (Chinese Academy of Sciences, China; Shenyang Institute of Automation, Chinese Academy of Sciences, China; Institutes for Robotics and Intelligent Manufacturing, Chinese Academy of Sciences, China)

Software Radio Based Drone Eviction 356
Wei Lu (Fujian University of Technology, China), Li Wen Chen (Fujian University of Technology, China), Qing Chao Xiao (Fujian University of Technology, China), and Cheng Zhu (Fujian University of Technology, China)

The Influence of Deflector Form on Airflow Organization in Prefabricated Duct Elbows Based on CFD Simulation 360
Tang Yi (Shanghai Installation Engineering Group Co., Ltd, China), Pan Jian (Shanghai Installation Engineering Group Co., Ltd, China), Cao Xiaocheng (Shanghai Installation Engineering Group Co., Ltd, China), Ni Zhihai (Shanghai Installation Engineering Group Co., Ltd, China), and Chen Xiaoweng (Shanghai Installation Engineering Group Co., Ltd, China)

A Street View Image Retrieval Method Based on Fusion of Multiple Features 364
XiaoLin Li (Wuhan Institute of Technology, China), Gang Xu (Wuhan Institute of Technology, China), ZhuoHao Chen (Wuhan Institute of Technology, China), and BoWen Huang (Wuhan Institute of Technology, China)

Quantum Image Watermarking Technology Based on Quantum Wavelet Transform 371
Rongyu Wu (Guangxi Normal University, China) and Yusi Xu (Guangxi Normal University, China)

Wideband LFM Interference Suppression of GNSS Receiver Based on Fractional Fourier Transform and Power Inversion 376
Zeze Yang (University of Electronic Science and Technology of China, China), Yubai Li (University of Electronic Science and Technology of China, China), Lei Mao (Taidou Microelectronics Technology Company, China), Fei Wang (Taidou Microelectronics Technology Company, China), and Jun Pan (Taidou Microelectronics Technology Company, China)

Dynamic Attitude Estimation Using MEMS and Optical Flow Sensors 382
Li Xiang (Guilin University of Electronic Technology, China), Shi Qi (Guilin University of Electronic Technology, China), and Tang Yanmei (Guangxi Normal University, China)

Research on Digital Image Recognition Algorithm Based on Pattern Recognition 386
Shuai Di (Datang Northeast Electric Power Test & Research Institute Co., Ltd, China)

Research on the MAX038 Simulation Model for Electromagnetic Inspection 392
Guo Qing (Guilin University of Electronic Science and Technology, China), Hongbo Zhang (Guilin University of Electronic Science and Technology, China), Hongzhi Hu (Guilin University of Electronic Science and Technology, China), and Qin Chang (Guilin University of Electronic Science and Technology, China)

Research on the Application of Knowledge Graph in the Integrated Course STEAM 397
Gao Baoling (Jimei University, China) and Lin Tao (Jimei University, China)

Design of FIR Digital Filter Based on Improved Neural Network 406
Ting Xue (Kunming Shipbuilding Equipment Research and Test Center, China)

A Multi-Image Mosaic Method for Farmland UAV Aerial Images via Reference Image Optimization 411
Jiong Pan (Beijing Institute of Technology, China), Longfei Chen (Beijing Institute of Technology, China), and Leyi Zhang (Beijing Institute of Technology, China)

Silicon-Based Solar Cell: Materials, Fabrication and Applications 418
Deng Pan (King's Collage London, UK), Tujie Guo (Tianjin University, China), and Xuehua Chen (Shanghai University, China)

Dynamic Flow Entry Timeouts Based Packet Nonuniform Sampling for Elephant Flow Detection .. 431
Ling Xia Liao (Guilin University of Aerospace Technology, China), Xiaohang Ma (Guilin University of Electronic Technology, China), Zhi Li (Guilin University of Aerospace Technology, China), and Han-Chieh Chao (National Dong Hwa University, R.O.C.)

Research on Factors Affecting Communication Quality in Communication System 440
Yang Bai (Xidian University), Ruike Xiong (Changchun University Of Science and Technology), and Zhiying Wei (Xidian University)

Research and Practice of Anti-Cheating Technology in Invigilation System 447
Fuken Zhou (Guangdong Neusoft Institute, China), Mingke Chen (Guangdong Neusoft Institute, China), Nan Lu (Guangdong Neusoft Institute, China), and Juntian Liu (Guangdong Neusoft Institute, China)

Author Index **451**