2023 International Conference on Computer Science and Automation Technology (CSAT 2023)

Shanghai, China
6 – 8 October 2023

IEEE Catalog Number: CFP23UT6-POD
ISBN: 979-8-3503-7144-4

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: CFP23UT6-POD
ISBN (Print-On-Demand): 979-8-3503-7144-4
ISBN (Online): 979-8-3503-7143-7

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

2023 International Conference on Computer Science and Automation Technology (CSAT)

CSAT 2023

Table of Contents

Message from the General Chair ..... **xx**
Message from the Technical Program Chairs ..... **xxi**
Organizing Committee ..... **xxii**
Technical Program Committee ..... **xxiii**
Reviewers ..... **xxv**
Sponsors ..... **xxvii**

CSAT 2023

A Cloud Computing Based Digital Storage and Evaluation Platform for Buddhist Literature 1
Jie Zhou (The College of Literature and Journalism of Sichuan University, China)

A Cloud Platform for Data of Three-Product Rapid Detection in the Development of Cloud Computing 6
Qili Jiang (Beijing Academy of Science and Technology, China)

A Comparative Analysis of Image-Based Classification and Object Detection for the Ocular Redness Grading 11
Mini Han Wang (Chinese University of Hong Kong; City University of Macau; Zhuhai People's Hospital (Zhuhai Hospital Affiliated with Jinan University); Zhuhai Institute of Advanced Technology Chinese Academy of Sciences; Perspective Technology Group, China), Yu Yang (Zhuhai Aier Eye Hospital, China), Xiaoxiao Fang (Zhuhai Aier Eye Hospital, China), Zhiyuan Lin (Beijing Institute of Technology; Perspective Technology Group; Zhuhai Institute of Advanced Technology Chinese Academy of Sciences, China), Peijin Zeng (Beijing Institute of Technology; Perspective Technology Group; Zhuhai Institute of Advanced Technology Chinese Academy of Sciences, China), Xudong Jiang (Beijing Normal University - Hong Kong Baptist University United International College; Perspective Technology Group, China), Junbin Fang (Jinan University, China), Guanghui Hou (Zhuhai Aier Eye Hospital, China), and Kelvin Kl Chong (Chinese University of Hong Kong, China)

A Demand Forecasting Method for High Value-Added Agri-Food Based on Machine Learning and Time Series Analysis 16
Jianyi Zhao (Zhejiang University of Technology, China), Mi Li (Zhejiang University of Technology, China), Jingya Zhang (Zhejiang University of Technology, China), and Fangzhong Qi (Zhejiang University of Technology, China)

A Navigation System for Guiding Blind People in Indoor and Outdoor 20
Weijia Ye (The Second Research Institute of CAAC, China), Ning He (The Second Research Institute of CAAC, China), Jin Wang (The Second Research Institute of CAAC, China), and Xiaozhongling Yuan (The Second Research Institute of CAAC, China)

A No-Reference Image Quality Assessment Methodology Based on Distortion Information Extraction 25
Jinwei Liu (Wuhan University, China), Zihan Gui (Wuhan University, China), and Chenghao Yuan (Wuhan University, China)

A Study of Research Data and Metadata Standards in the Field of Humanities and Social Sciences 28
Zheng Li (Xiamen University Library, China)

An Android Application Software Security Protection Method Based on Hybrid Reinforcement 32
Ye Yao (Northwest Polytechnical University, China), Jiayu Li (Queen Mary University of London Engineering School, Northwest Polytechnical University, China), Yian Zhu (Northwest Polytechnical University, China), Liang Qian (Northwest Polytechnical University, China), Yake Han (Northwest Polytechnical University, China), and Zhisheng Zhang (Northwest Polytechnical University, China)

An Edge Computing-Based Data Collection Method for Smart Grid Data Acquisition System 38
Bin Fang (Information and Communication Branch of State Grid Hunan Electric Power Company Limited, China), Jingyuan Xue (Information and Communication Branch of State Grid Hunan Electric Power Company Limited, China), Xin Huang (Information and Communication Branch of State Grid Hunan Electric Power Company Limited, China), Fangliao Yang (Information and Communication Branch of State Grid Hunan Electric Power Company Limited, China), Haozhi Li (Information and Communication Branch of State Grid Hunan Electric Power Company Limited, China), and Ning Xu (Information and Communication Branch of State Grid Hunan Electric Power Company Limited, China)

An Effective Knowledge Mining Method for Compressor Fault Text Data Based on Large Language Model 44
Xiaodong Qin (China University of Petroleum-Beijing, China), Yuxuan He (China University of Petroleum-Beijing, China), Jie Ma (China University of Petroleum-Beijing, China), Weiyuan Peng (China University of Petroleum-Beijing, China), Enric Zio (Politecnico di Milano, Italy; MINES ParisTech PSL Research University, France), and Huai Su (China University of Petroleum-Beijing, China)

An Empirical Study on Quantitative Analysis of Legal Literature Based on Artificial Intelligence Algorithms 49
Fugang Zhao (Shandong University of Political Science and Law, China)

An Improved Scheduling Algorithm Based on Jellyfish Search for Measurement Data Process System 53
Bin Fang (Information and Communication Branch of State Grid Hunan Electric Power Company Limited, China), Shi Zhu (Information and Communication Branch of State Grid Hunan Electric Power Company Limited, China), Qi Yu (Information and Communication Branch of State Grid Hunan Electric Power Company Limited, China), Li Li (Nanjing NARI Information and Communication Technology, China), Yijia Li (Information and Communication Branch of State Grid Hunan Electric Power Company Limited, China), and Jiayuan Lou (Central South University, China)

An Integrated Aircraft Maintenance Training Platform Based on "Simulation Training+Auxiliary Operation" 59
Wei Zhang (Air Force Engineering University, China), Dan Zhu (Air Force Engineering University, China), and Yanfu Xie (Air Force Engineering University, China)

An Intelligent Recommendation System for Improvisation Playing and Singing Built with Database Technology 64
Chenyan Dai (Tianhua College, Shanghai Normal University, China)

Analysis of Environmental Protection and Economic Sustainability by Integrating Machine Learning Algorithms 71
Jiantao Jiang (Guangdong Baiyun University, China)

Analysis of the Impact of Distributed Photovoltaic on the Operating Parameters of Rural Distribution Station Area 77
Yifan Wu (Shanghai University of Electric Power, China), Ning Xu (State Grid Anhui Electric Power, China), Peng Xia (State Grid Anhui Electric Power, China), and Juan Chen (State Grid Anhui Electric Power, China)

Application of BIM Virtual Simulation Technology in Architectural Practice Under the Background of Digital Transformation 81
Yanfen Zhang (Guangdong Polytechnic of Science and Technology, China)

Application of Computer Aided X-ray Detection to Graphite Defects 86
Zhi Li (HeiLongJiang University of Technology, China), Yifei Jia (HeiLongJiang University of Technology, China), and Mingyang Du (HeiLongJiang University of Technology, China)

Application of Computer Technology in the Metaverse Exhibition Country Partner (CP) and Operation Partner (OP) Modules 91
Tingli Wen (Binhai School of Foreign Affairs of Tianjin Foreign Studies University, China)

Application of Data Mining Technology in Computer Network Virus Prevention 97
Hong Li (Dalian University of Technology City Institute, Dalian, China)

Application of Fault Analysis Model Based on Multimodal Data in Intelligent Operation and Maintenance of Island Photovoltaic 103
Chun Gan (State Grid Zhejiang Electric Power Co., Ltd., China), Yinxian Zhang (State Grid Zhejiang Electric Power Co., Ltd, China), and Zhanyao Zhang (State Grid Zhejiang Electric Power Co., Ltd., China)

Application of TOA Cooperative Location Algorithm Based on Modified Chan and Taylor 108
Jie Yang (Zhejiang University, China), Hongwei Shi (Fato Automation Technology Co., Ltd, China), Kai Zheng (NingboTech University, China), and Jun Qiu (NingboTech University, China)

Application of Virtual Reality Technology Based on Unity in Environmental Art Design 114
Changliang Tan (Taiyuan University of Technology, China)

Application Research of Temperature Control System of Small Container of Cigarette Pack Based on Velocity Model 119
Haibin Yao (Ningbo Cigarette Factory, China Tobacco Zhejiang Industrial Co., Ltd, China), Linjie Zheng (Ningbo Cigarette Factory, China Tobacco Zhejiang Industrial Co., Ltd, China), Xue Shen (Ningbo Cigarette Factory, China Tobacco Zhejiang Industrial Co., Ltd, China), and JianLi Zhu (Ningbo Cigarette Factory, China Tobacco Zhejiang Industrial Co., Ltd)

Applications of Blockchain and IoT in Sustainability Information Disclosure 122
Meijie Du (Beijing Language and Culture University, China) and Xiaoyu Qu (Beijing Language and Culture University, China)

Automatic Discovery Technology for Full Business Scenario Links in Cloud Environment 130
Ran Li (State Grid Information and Telecommunication Branch, China), Xiaoshuang Gu (State Grid Information and Telecommunication Branch, China), Shulin Zhan (State Grid Information and Telecommunication Branch, China), Yang Li (State Grid Information and Telecommunication Branch, China), and Xinyi Le (State Grid Information and Telecommunication Branch, China)

Bypass Leakage Risk Assessment Based on Mutual Information Game 135
Jianbo Yao (Hezhou University, China) and Tao Zhang (5G Innovation Center, China Unicom, China)

Collaborative Optimization Measurement Method for Network Topology 141
Yuguang Zhang (Northwestern Polytechnical University; No.30 Institute of CETC, China), Zhihong Rao (Northwestern Polytechnical University, China), Deming Mao (China Electronic Technology Cyber Security Co., Ltd., China), Wei Zhang (No.30 Institute of CETC, China), and Zhicheng Zhu (No.30 Institute of CETC, China)

Comparative Analysis of YOLOv5 and YOLOv8 for Tear Film Lipid Layer Detection: Architectural Disparities, Performance Metrics, and Future Implications 147
Mini Han Wang (Chinese University of Hong Kong; City University of Macau; Zhuhai People's Hospital (Zhuhai Hospital Affiliated with Jinan University); Zhuhai Institute of Advanced Technology Chinese Academy of Sciences; Perspective Technology Group, China), Zhiyuan Lin (Beijing Institute of Technology; Perspective Technology Group; Zhuhai Institute of Advanced Technology Chinese Academy of Sciences, China), Peijin Zeng (Beijing Institute of Technology; Perspective Technology Group; Zhuhai Institute of Advanced Technology Chinese Academy of Sciences, China), Wenhan Hu (City University of Macau; Zhuhai Institute of Advanced Technology Chinese Academy of Sciences; Perspective Technology Group, China), Haoyang Liu (Guangdong Medical University; Zhuhai Institute of Advanced Technology Chinese Academy of Sciences; Perspective Technology Group, China), Yunxiao Liu (Guangdong Medical UniversityZhuhai Institute of Advanced Technology Chinese Academy of Sciences; Perspective Technology Group, China), Guanghui Hou (Zhuhai Aier Eye Hospital, China), Kelvin Kl Chong (Chinese University of Hong Kong, China), and Xiangrong Yu (Zhuhai People's Hospital (Zhuhai Hospital Affiliated with Jinan University), China)

Computational Analysis and Numerical Simulation of Baige Residual Landslides 151
Yuehao Tang (Changjiang Institute of Technology, China)

Computer Vision-Based Damage Identification and Structural Analysis of a Practical Transmission Tower 156
Keji Chen (State Grid Zhejiang Economic Research Institute, China), Xianzhe Li (Zhejiang University, China), Mingfeng Huang (Zhejiang University, china), Wenjuan Lou (Zhejiang University, China), and Kang Cai (Zhejiang University, China)

Construction Study on Intelligent Energy Safety Operation and Maintenance System 163
Jian Cai (Quzhou Power Supply Company of State Grid Zhejiang Electric Power Co., Ltd, China), Zhibin Mao (Quzhou Power Supply Company of State Grid Zhejiang Electric Power Co., Ltd, China), Kai Zhou (Quzhou Power Supply Company of State Grid Zhejiang Electric Power Co., Ltd, China), Weijiang Wan (Quzhou Power Supply Company of State Grid Zhejiang Electric Power Co., Ltd, China), and Qi Chen (Quzhou Power Supply Company of State Grid Zhejiang Electric Power Co., Ltd, China)

Credit Card Fraud Detection Based on Fcm-Svmsmote-Cnn 169
Zhicong Xu (Xiamen University Tan Kah Kee College, China) and Yu-Chung Chang (Xiamen University Tan Kah Kee College, China)

Design and Experimental Study of Seedling Tray Handling Device 175
Dongdong Jia (Beijing University of Technology, China), Xiaobei Han (Jiangsu University Zhenjiang, China), Feifei Shan (Beijing Academy of Agriculture and Forestry Sciences, China), and Guohua Gao (Beijing University of Technology, China)

Design and Implementation of a Student Psychological Assessment and Counseling System Under Data Mining Algorithms 182
Li Li (Wuhan Railway Vocational College Of Technology, China) and Ping Xiao (Wuhan Railway Vocational College Of Technology, China)

Design and Implementation of Agricultural Information Management System Based on Mobile GIS 188
Dan Han (Wuhan Railway Vocational College of Technology, China) and Qin Ran (Wuhan Railway Vocational College of Technology, China)

Design and Implementation of Electrocardiogram Signal Analysis and Processing System Based on Cortex M4 194
Feng Wei (Ningxia Institute of Science and Technology, China) and Peipei Wang (Ningxia Institute of Science and Technology, China)

Design and Manufacture of Automatic Test-Bed for Locomotive Wiper 201
Bin Yang (Sujiatun Locomotive Depot of China Railway Shenyang Bureau Group Co., Ltd., China) and Jun Liu (Sujiatun Locomotive Depot of China Railway Shenyang Bureau Group Co., Ltd., China)

Design and Research of Personalized News Recommendation System Based on LSTM Algorithm . 204
Yinghui Liu (Sichuan University Jinjiang College, China) and Li Gao (Sichuan University Jinjiang College, China)

Design and Simulation of FIR Digital Filter Under FPGA 211
Chuang Wang (CRRC Dalian R&D Co., Ltd., China), Tienian Chen (CRRC Dalian R&D Co., Ltd., China), Jiawei Liu (CRRC Dalian R&D Co., Ltd., China), and Yanchao Wang (CRRC Dalian R&D Co., Ltd., China)

Design of a New Multi-Channel Parallel Wideband Digital Radar Reconnaissance Receiver 216
Nan Yu (Dalian University, China)

Design of an English Speaking Interactive System Based on Artificial Intelligence 219
Haiyan Zhou (Jilin University of Arts, China)

Design of an Intelligent Parts Sorting System 226
Lijie Wang (Xi'an University of Technology, China), Dekai Xu (Xi'an University of Technology, China), and Jianjun Zhao (Shaanxi Baocheng Aviation Instrument Co. Ltd., China)

Design of Centralized Monitoring System of Heat Supply Network Based on SCADA 230
Lijie Wang (Xi'an University of Technology, China), Zheyi Wang (Xi'an University of Technology, China), and Dekai Xu (Xi'an University of Technology, China)

Design of End-to-end Encryption Systems in the Digital Era 234
Yanjie Li (Shandong Institute of Commerce and Technology, China)

Design of English Speaking Training System Based on Human-Computer Interaction 239
Patime Ghoji (Northwest Minzu University, China), Aysigul Abduwali (Northwest Minzu University, China), and Maysigul Husiyin (Northwest Minzu University, China)

Design of Hybrid Cross Chain Scheme Based on Relay Chain 244
Junnan Xu (Zhejiang Normal University, China) and Zhongyu Chen (Zhejiang Normal University, China)

Design of Mathematics Learning System Based on Mobile Terminal and Internet Technology 249
Qian Gao (Yantai Institute of Technology, China)

Design of Mental Health Consultation System Based on Deep Learning Algorithm 257
Qin Ran (Wuhan Railway Vocational College of Technology, China) and Dan Han (Wuhan Railway Vocational College of Technology, China)

Design of Physical Health Monitoring System Based on Wearable Devices 263
Zhongwen Lu (Yili Normal University, China)

Design of Real Vehicle Communication Protocol and Vehicle Controller Software Architecture Based on EEPROM Function 272
Jiangyi Lv (Beijing Polytechnic, China), Hualei Zhang (Beijing Polytechnic, China), Minjie Liu (Beijing Polytechnic, China), Chunhong Zhu (Beijing Polytechnic, China), and Meili Sui (Beijing Polytechnic, China)

Design of the Grid WebGIS-Based Remote Power Grid Line-Tracking System 276
Pengzhan Fan (State Grid Corporation of China, China), Hejun Zhang (State Grid Corporation of China, China), Qinwei Dong (State Grid Jiangsu Electric Power Co., LTD., China), and Yu He (State Grid Jiangsu Electric Power Co., LTD., China)

Designing and Implement of Glow-Wire Temperature Control System Based on IMC-PID 280
Ming Zhao (Harbin Guangsha College, China)

Detection of Malicious URL Based on BERT-CNN 284
Yu Yang (State Grid Suzhou Power Supply Company of State Grid Jiangsu Electric Power Co., Ltd, China), Heting Li (State Grid Suzhou Power Supply Company of State Grid Jiangsu Electric Power Co., Ltd., China), and Dongsheng Jing (State Grid Suzhou Power Supply Company of State Grid Jiangsu Electric Power Co., Ltd., China)

DetMLB: Network Traffic Detection System and Detector Load Balancing Method Under Microservice Architecture 289
Qi Fan (GuangZhou University, China), Xi Luo (GuangZhou University, China), Hao Sun (GuangZhou University, China), Fan Li (Peng Cheng Laboratory, China), and Yihang Sun (GuangZhou University, China)

Development and Application of Real-Time Monitoring System for Energy Consumption and Carbon Emission in Construction Group Based on Internet of Things 294
Wei Zhao (CSCEC International Operations, China), Chao Wang (CSCEC International Operations, China), and Yujun Zhang (CSCEC International Operations, China)

Development of Cylinder Head Assembly of Rotary Valve Engine Based on 3D Printing Technology 298
Baoqing Deng (Zhuhai College of Science and Technology, China), Mengqi Deng (University of Macau, China), Shihang Li (Faw Pentium Car Co. LTD, China), Enguang Zhang (Zhuhai College of Science and Technology, China), and Xiaoda Li (Zhuhai College of Science and Technology, China)

DF-Net: A Defect Detection Method of Ceramic Tile Printing Texture Based on Multi-Label Classification 305
Shuangmiao Li (South China Normal University, China) and Yaoxian Zhou (South China Normal University, China)

Diagnosis and Prediction of Servo Motor System of High Speed Winder Based on SiePA 310
Yujie Lu (Ningbo Cigarette Factory, China Tobacco Zhejiang Industrial Co., Ltd, China) and Lingbin Gong (Ningbo Cigarette Factory, China Tobacco Zhejiang Industrial Co., Ltd, China)

Dynamic Access Control Algorithm to Detect and Defend Intrusion for IoT Nodes 313
Guoliang Han (Aerospace Kaiyuan Technology Co.Ltd., China)

Electrical Characteristics of Floating-Body and Body-Contacted Silicon-On-Insulator N-Channel Transistor 316
Zijun Ye (Tiangong University, China)

Electromagnetic Compatibility Design of Reinforced LCD 320
Chang Liu (Jiangsu Automation Research Institute, China)

Enhancing Machine Learning in Information Security: Power-law Distribution and Dragon King... 324
Yuan Wang (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences; Sangfor Inc., China) and Xiaofan Chen (Sangfor Inc., China)

Eu Certified RF Testing Requirements for Wireless Communication Products Using WiFi Protocol 328
Hongying Fu (Shanghai Institute of Measurement and Testing Technology, China), Wanru Chen (Shanghai Institute of Measurement and Testing Technology, China), Shanyi Jin (Shanghai Institute of Measurement and Testing Technology, China), Zhong Wang (Shanghai Institute of Measurement and Testing Technology, China), Wenhui Zhao (Shanghai Institute of Measurement and Testing Technology, China), and Yumei Jiang (Shanghai Institute of Measurement and Testing Technology, China)

Fact-CoT: Explicit Fact-Enhanced Chain-of-Thought Prompting for Commonsense Reasoning 335
Ling Dai (University of Electronic Science and Technology of China, China) and Ke Qin (University of Electronic Science and Technology of China, China)

Feasibility Study of Electrification in Construction Machinery Based on Energy Demand 339
Yong Li (CATARC Automotive Test Center (Tianjin) Co., Ltd.; China Automotive Technology & Research Center Co., Ltd, China), Jin Wang (China Auto Information Technology (Tianjin) Co., Ltd; China Automotive Technology & Research Center Co., Ltd, China), Zhen Kai Xie (CATARC Automotive Test Center (Tianjin) Co., Ltd; China Automotive Technology & Research Center Co., Ltd, China), and Kai Shi (Tianjin Ecology and Environment Bureau, China)

GSTCN: Graph-Based Spatial-Temporal Convolutional Networks for Advanced ENSO Forecasting 344
Chengyu Liang (Ocean University of China, China), Gaojin Shu (Ocean University of China, China), and Bo Yin (Ocean University of China, China)

Harmonizing Dynamic Frequency Analysis with Attention Mechanisms for Efficient Facial Image Authenticity Detection 348
Yulai Zhao (Hefei University of Technology, China), Jianhua Li (Hefei University of Technology, China), and Ling Wang (Anhui Communications Vocational and Technical College, China)

HCTNet: Hybrid CNN-Transformer Architecture Network for Self-Supervised Monocular Depth Estimation 353
Li Ma (Zhengzhou University; Nanyang Institute of Technology, China), Yonghui Fu (Zhengzhou University, China), Xinhua Lu (Zhengzhou University; Nanyang Institute of Technology, China), Qingji Xue (Zhengzhou University; Nanyang Institute of Technology, China), and Jingui Miao (Zhengzhou University, China)

High-Level Synthesis Algorithm for Continuous-Flow Microfluidic Biochips Under Device Volume Constraints 358
Zhengyang Chen (Fuzhou University, China), Youlin Pan (Fuzhou University, China), Zhen Chen (Fuzhou University, China), and Genggeng Liu (Fuzhou University, China)

High-Tech Industry Employees Turnover Intention Prediction Model Based on Machine Learning. 364
Shujie Zhang (Xiamen University Tan Kah Kee College, China) and Yu-Chung Chang (Xiamen University Tan Kah Kee College, China)

Highway Traffic Flow Model Based on Control Theory 369
Yue Yang (Dalian Naval Academy, China), Meili Zhang (Dalian Naval Academy, China), and Weili Liu (Dalian Naval Academy, China)

Improvement of Aluminum Foil Paper Transportation Stability for ZB45M Packaging Machine 374
Ting Zhang (Ningbo Cigarette Factory; Tobacco Zhejiang Industrial Co., Ltd., China), Miaojie Shen (Ningbo Cigarette Factory; Tobacco Zhejiang Industrial Co., Ltd., China), Hui Ding (Ningbo Cigarette Factory; Tobacco Zhejiang Industrial Co., Ltd., China), Jun Zhou (Ningbo Cigarette Factory; Tobacco Zhejiang Industrial Co., Ltd., China), and Kai Wu (Ningbo Cigarette Factory; Tobacco Zhejiang Industrial Co., Ltd., China)

Improving Elevator Quality Detection and Emergency Work Based on TOPSIS Evaluation and SVM Algorithm 378
Xukun Wang (Qinghai Technology Center of China Special Equipment Inspection and Research Institute, China) and Yu-Chung Chang (Xiamen University Tan Kah Kee College, China)

Individualized Resource Allocation for 5G Network Slicing Based on Knapsack Stragegy 383
Yueying Wang (LiaoNing Petrochemical University, China) and Chengyin Ye (LiaoNing Petrochemical University, China)

Indoor Navigation with Augmented Reality 388
Weijia Ye (The Second Research Institute of CAAC, China), Ning He (The Second Research Institute of CAAC, China), and Jin Wang (The Second Research Institute of CAAC, China)

Intelligent Network Threat Detection Engine Based on Open Source GPT-2 Model 392
Ximing Zhang (Northeastern University at Qinhuangdao, China), Tong Chen (Northeastern University at Qinhuangdao, China), Jingyi Wu (Northeastern University at Qinhuangdao, China), and Qilong Yu (Northeastern University at Qinhuangdao, China)

Large Field of View Ship Moving Target Detection Based on Track Adaptive Maintenance 398
Ning Zhang (Shanghai Aerospace Electronic Technology Institute, China), Haitao Jing (Shanghai Academy of Spaceflight Technology, China), Weiwei Kong (Shanghai Aerospace Electronic Technology Institute, China), Guanxiong Wang (Shanghai Aerospace Electronic Technology Institute, China), and Wenbo Tian (Shanghai Aerospace Electronic Technology Institute, China)

Load Aggregators Based on Improved Particle Swarm Optimization Algorithm Participate in the Research of Multi-Market Operation Optimization Model 403
Lei Yang (State Grid Hebei Service Center, China), Xiaona Han (State Grid Hebei Communications Co, Ltd, China), Yang Yang (State Grid Hebei Economics Research Institute, China), Yuntong Lv (State Grid Hebei Electric Power Co., Ltd, China), Ming Ji (State Grid Hebei Electric Power Co., Ltd, China), and Jiyun Lin (State Grid Hebei Electric Power Co., Ltd, China)

Method for Capturing Tennis Training Actions Under Machine Vision Images 409
Chengmei Wang (Chongqing Vocational Institute of Engineering, China)

Moderate Deviations for the Randomly Weighted Sums with Arbitrary Dependence Between the Primary Random Variables and Counting Process 414
Yinghua Dong (Nanjing University of Information Science and Technology, China)

Novel Hybrid Neural Network Modeling Method for Melt Index Industrial Soft Sensor 417
Zhiwei Chen (Beijing University of Chemical Technology; Ministry of Education of China, China), Yi Lu (Beijing University of Chemical Technology; Ministry of Education of China, China), and Zhiqiang Geng (Beijing University of Chemical Technology; Ministry of Education of China, China)

On Network Communication and National Information Security 422
Qiangchun Wang (Sichuan University of Media and Communications, China)

Operation Management of Manned Space Station Base on Space-Integrated-Ground Network 428
Ming Liu (Beijing Institute of Spacecraft System Engineering, China), Xiaohong Lin (China Petroleum Material Procurement Center, China), and Xiaofeng Liang (Beijing Institute of Spacecraft System Engineering, China)

Optimisation Simulation of The Dynamics of the Waste Compactor Loading Mechanism 434
Dongxu Zhang (Hefei University, China), Lei Wang (Hefei University, China), Jie Jin (Hefei University, China), and Lei Zheng (JT Environmental Technology Co., China)

Parameter Optimization of a Grounded DVA Model Based on Intelligent Particle Swarm Optimization Algorithm 441
Yuying Chen (Henan Agricultural University; Beijing University of Technology, P. R. China) and Jing Li (Beijing University of Technology, P. R. China)

Path Planning for UAV Based on MPSO 447
Ke Wang (Beijing Institute of Astronautical Systems Engineering, China), Shunmin Li (CSSC Systems Engineering Research Institute, China), Chaojie Liang (Beijing Institute of Astronautical Systems Engineering, China), Yadong Chen (Beijing Institute of Astronautical Systems Engineering, China), Fengzhe Zhang (Beijing Institute of Astronautical Systems Engineering, China), and Yong Guo (Northwestern Polytechnical University, China)

Practice Research of Blended Teaching Mode Based on Virtual Simulation Technology 453
Wei Meng (Changchun Humanities and Sciences College, China) and Xiaoxi Liu (Changchun Humanities and Sciences College, China)

Preview Repetitive Control for Linear Discrete-Time Systems 457
Li Li (Hubei University of Economics, China) and Hui Ye (Hubei University of Economics, China)

Psychological Stress Assessment System Under Big Data Analysis Technology 462
Ping Xiao (Wuhan Railway Vocational College Of Technology, China) and Li Li (Wuhan Railway Vocational College Of Technology, China)

QDSE: Question-Driven Semantic Enhancement for Logical Reasoning 467
Yuchuan Zheng (University of Electronic Science and Technology of China, China) and Ke Qin (University of Electronic Science and Technology of China, China)

RCALN: A Hybrid Intrusion Detection System Incorporating Channel Attention in CNN and Residual Networks with LSTM 471
Minghui Chen (Guangzhou University, China), Xi Luo (Guangzhou University, China), Yuxia Zhang (Guangzhou University, China), Zitong Duan (Guangzhou University, China), and Fan Li (Peng Cheng Laboratory, China)

Research and Design of an Intelligent Academic Affairs Assessment System Based on ASP.NET 477
Hongyu Zhou (Shandong Institute of Commerce and Technology, China)

Research on Automation Operation and Maintenance Service Platform of Information System 484
Yunqi Chen (China Coal Technology Engineering Group Chongqing Research Institute, China) and Jin Xu (China Coal Technology Engineering Group Chongqing Research Institute; Chongqing University, China)

Research on Autorotation Flight Control Technology of Unmanned Helicopters 488
Hongzheng Chen (Nanjing University of Aeronautics and Astronautics, China), Jia Tian (Nanjing University of Aeronautics and Astronautics, China), Shuaichen Nie (Nanjing University of Aeronautics and Astronautics, China), and Shouzhao Sheng (Nanjing University of Aeronautics and Astronautics, China)

Research on Efficient and Trustworthy Traceability Methods for Agricultural Product Quality and Safety 493
Song Tang (Institute of Applied Mathematics, Hebei Academy of Sciences; Tianjin University; Hebei Province Information Security Certification Technology Innovation Center, China), Zhiqiang Wang (Institute of Applied Mathematics, Hebei Academy of Sciences; Hebei Province Information Security Certification Technology Innovation Center; Julu Institute of Applied Technology, China), GaiFang Tan (Institute of Applied Mathematics, Hebei Academy of Sciences; Hebei Province Information Security Certification Technology Innovation Center, China), and Yandong Ma (Institute of Applied Mathematics, Hebei Academy of Sciences, Hebei Province Information Security Certification Technology Innovation Center, China)

Research on Electromagnetic Shielding Methods Based on SAR Image Simulation 499
Sijin Xiong (Northwest Institute of Nuclear Technology, China), Wei Kan (Northwest Institute of Nuclear Technology, China), Peng Zhang (Northwest Institute of Nuclear Technology, China), Jianhua Zhang (Northwest Institute of Nuclear Technology, China), Jiachen Shen (Northwest Institute of Nuclear Technology, China), and Minjie Xu (Northwest Institute of Nuclear Technology, China)

Research on Flight Control Technology of High Speed Helicopter Based on Reinforcement Learning 504
Mo Zhai (Nanjing University of Aeronautics and Astronautics, China), Zhiqi Zhang (Nanjing University of Aeronautics and Astronautics, China), Shuaichen Nie (Nanjing University of Aeronautics and Astronautics, China), and Shouzhao Sheng (Nanjing University of Aeronautics and Astronautics, China)

Research on Four-Dimensional Flight Guidance and Control Technology of Helicopter 509
Jia Tian (Nanjing University of Aeronautics and Astronautics, China), Shuaichen Nie (Nanjing University of Aeronautics and Astronautics, China), Hongzheng Chen (Nanjing University of Aeronautics and Astronautics, China), Zhiqi Zhang (Nanjing University of Aeronautics and Astronautics, China), Mo Zhai (Nanjing University of Aeronautics and Astronautics Nanjing, China), and Shouzhao Sheng (Nanjing University of Aeronautics and Astronautics, China)

Research on Full Link Monitoring and Fault Link Automatic Repair Based on Data Center 514
Jiali Sun (China National Grid Anhui Electric Power Co., Ltd., China), Cong Hu (China National Grid Anhui Electric Power Co., Ltd., China), Ruixuan Lu (China National Grid Anhui Electric Power Co., Ltd., China), Sun Qi (China National Grid Anhui Electric Power Co., Ltd., China), Zhen Yao (China National Grid Anhui Electric Power Co., Ltd., China), Xin Ding (China National Grid Anhui Electric Power Co., Ltd., China), Cuiling Liu (China National Grid Anhui Electric Power Co., Ltd., China), and Haoyu Hou (China National Grid Anhui Electric Power Co., Ltd., China)

Research on Handwriting Character Recognition Technology Based on Bidirectional Long Short Term Memory Neural Network 517
Yiliang Wu (Guangdong Power Grid Co., Ltd. Jiangmen Power Supply Bureau, China), Tinghui Lu (Guangdong Power Grid Co., Ltd. Jiangmen Power Supply Bureau, China), Cuimei Liu (Guangdong Power Grid Co., Ltd. Jiangmen Power Supply Bureau, China), Fengchan Guo (Guangdong Power Grid Co., Ltd. Jiangmen Power Supply Bureau, China), and Xuliang Luo (Guangdong Power Grid Co., Ltd. Jiangmen Power Supply Bureau, China)

Research on Heat Dissipation Simulation of Glare Device Based on Ansys-Icepak 524
Jinpeng Zhao (Jiangsu Automation Research Institute, China)

Research on Improving Method of RCT-YOLOv5s Network for Surface Defect Extraction of Steel Wire Rope 529
Shuai Chen (Xi'an University of Technology, China), Enxiu Shi (Xi'an University of Technology, China), and Zheng Bao (Xi'an University of Technology, China)

Research on Internet Enterprise User Data Control System 535
Fujun Wan (China National Institute of Standardization, China), Xingyao Zhou (China National Institute of Standardization, China), and Yuchen Zhang (China National Institute of Standardization, China)

Research on Optimal Layout Formation Techniques for Dynamic Planning of Single-Line Diagrams 538
Hongyu Zhou (State Grid Corporation of China, China), Feng You (NARI Group Corporation, China), Qiang Wu (State Grid Jiangsu Electric Power Co., LTD., China), Xiao Yang (State Grid Jiangsu Electric Power Co., LTD., China), and Xinlian Bu (State Grid Jingjiang Power Supply Company, China)

Research on Power Control Algorithm Based on Non Cooperative Game in D2D Communication . 543
Zhuxin Guo (Liaoning Petrochemical University, China) and Chengyin Ye (Liaoning Petrochemical University, China)

Research on Radiation Emission Detection Method of Lithography Machine Subsystem 547
Wanru Chen (Shanghai Institute of Measurement and Testing Technology, China), Shizhen Zhao (Shanghai Institute of Measurement and Testing Technology, China), Jin Lu (Shanghai Institute of Measurement and Testing Technology, China), Ling Hu (Shanghai Institute of Measurement and Testing Technology, China), Ruihao Wu (Shanghai Institute of Measurement and Testing Technology, China), and Shanyi Jin (Shanghai Institute of Measurement and Testing Technology, China)

Research on Rotor Speed Optimization Strategy of TiltRotor Aircraft Based on IPSO-SQP Algorithm 552
Zhiqi Zhang (Nanjing University of Aeronautics and Astronautics, China), Mo Zhai (Nanjing University of Aeronautics and Astronautics, China), Shuaichen Nie (Nanjing University of Aeronautics and Astronautics, China), and Shouzhao Sheng (Nanjing University of Aeronautics and Astronautics, China)

Research on Search Engine Optimization Strategies Based on Google Algorithm 557
Fan Zhang (Philippine Christian University, Philippine; Huanggang College of Science and Technology, China)

Research on Surface Curvature Detection of Cigarette Packaging Paper Based on 3D Laser Scanning Technology 561
Jingsheng Jiang (Guangxi University of Science and Technology, China), Wenfeng Liu (Liuzhou Science and technology Information Institute, China), and Zidong Hu (Liuzhou Jing Chuang Technology Limited Company, China)

Research on the Activity and Emission Characteristics of Tractor-Trailers Based on Remote Monitoring 565
Zhenkai Xie (China Automotive Technology and Research Center Co., Ltd., China), Bing Fu (Anyang Ecology and Environment Bureau, China), and Xiaofeng Yang (Jinan Rail Transit Group Co., Ltd., China)

Research on the Directionality of a Cylindrical Array of Transducers Used for Navigation Type Ultrasound Catheters 569
Huai Zhang (Zhengzhou University, China) and Aimei Zhang (Zhengzhou University, China)

Research on the Influence of Color Feature Extraction Methods on Painting Styles Classification 574
Qiang Zhao (Shanxi University, China), Rui Zhang (Shanxi University, China), and Xin Bai (Shanxi University, China)

Research on the Power Management System of Automatic Waste Smoke Recycling Vehicle 581
Shunkai Sun (Ningbo Cigarette Factory; Tobacco Zhejiang Industrial Co., Ltd., China), Guorui Li (Ningbo Cigarette Factory; Tobacco Zhejiang Industrial Co., Ltd., China), Junjie Jiang (Ningbo Cigarette Factory; Tobacco Zhejiang Industrial Co., Ltd., China), Qi Xu (Ningbo Cigarette Factory; Tobacco Zhejiang Industrial Co., Ltd., China), Liang Chen (Ningbo Cigarette Factory; Tobacco Zhejiang Industrial Co., Ltd., China), Wei Peng (Ningbo Cigarette Factory; Tobacco Zhejiang Industrial Co., Ltd., China), and Hailin Fang (Ningbo Cigarette Factory; Tobacco Zhejiang Industrial Co., Ltd., China)

Research on Topology Identification Method for Low Voltage Distribution Area Based on Genetic Algorithm 588
Enguo Zhu (China Electric Power Research Institute, China) and Kuixi Chen (Beijing Zhixin Microelectronics Technology Co., Ltd, China)

Solar Image Denoising Using Non-Local Means Method 593
Lan Yu (Yunnan Land and Resources Vocational College, China) and Song Feng (Kunming University of Science and Technology, China)

Sound Source Direction Localization Scheme on Smart Phones with Dual Microphones 598
Cheng Yu (East China Jiaotong University, China), Chen Zhong (East China Jiaotong University, China), Zhang Ziping (East China Jiaotong University, China), and Zhi Yuxing (East China Jiaotong University, China)

Spammer Groups Detection Method Based on Local Expansion and Graph Contrastive Learning .. 603
Ru Ma (Yanshan University, China), Yiwei Gao (Yanshan University, China), Lihua Chen (Yanshan University, China), Yunfei Luo (Yanshan University, China), and Fuzhi Zhang (Yanshan University, China)

Static Calibration Structure Design of 6D Force Sensor 610
Yongli Wang (Huzhou University, China), Feifan Cao (Huzhou University, China), Ke Jin (Huzhou University, China), and Xuan Yu (Huzhou University, China)

Structural Design and Key Technology Research of Simulator for Branch Airports Controller Training 614
Wei Liao (Southwest Air Traffic Control Bureau of Civil Aviation)

Survey on Image-Oriented Transmission Line Inspection via UAV 622
Ran Quan (State Grid Jilin Electric Power Co., Ltd., China), Feng Sun (State Grid Jilin Electric Power Co., Ltd., China), Xiaoping Hu (State Grid Jilin Electric Power Co., Ltd, China), Miao Yu (State Grid Jilin Electric Power Co., Ltd, China), Jinxu Wang (Shenyang Jiuzhou Feixiang Tech. Co., Ltd, China), and Zixu Li (CCST, Jilin University, China)

Tailless Flying Wing UAV Buzz Response Analysis 626
Xu Jun (The38th Research Institute of China Electronics Technology Group Corporationname of organization (of Affiliation), China)

The Application of Network Topology Based on Autonomous Learning Characteristics in Virtual Power Plants 630
Chengfu Sun (Zhejiang Zheneng Energy Service Co., LTD., China) and Hua Yang (Zhejiang Zheneng Energy Service Co., LTD., China)

The Automatic Generation Algorithm for Single Line Diagrams of Distribution Networks Based on the Layout Model of Branch and Main Lines 636
Shaowu Wang (State Grid Corporation of China, China), Hongzhong Chen (State Grid Jiangsu Electric Power Co., LTD., China), Feng Dai (State Grid Jiangsu Electric Power Co., LTD., China), and Yu He (State Grid Jiangsu Electric Power Co., LTD., China)

The Design of the Control System for Equipment of Drilling-Tapping Once Shaping 641
Mingzhong Duan (Wuhan Railway Vocational College of Technology, China)

The Establishment of Tourism Parallel Corpus and its Application in Teaching 645
Jing Xiong (Nanchang Institute of Technology, China)

The Prospect of Metaverse and Digital Ecology Security Guarantee 649
Qiangchun Wang (Sichuan University of Media and Communications, China)

The Role of Computer Modelling Measurement Techniques in Experimental Testing of Energy Consumption in Green Buildings 656
Hongyu Chen (Kunming University; Kunming University of Science and Technology, China), Hassan Gholam (University of Stavanger, Norway), and Chengming Kuang (Kunming University of Science and Technology, China)

Topsis-Based Group Decision-Making Methodology in Pythagorean Fuzzy Setting 659
Chen Bin (University of Jinan, China)

Web Crawlers for News Aggregation Systems Based on Graph Convolutional Neural Networks ... 663
Li Gao (Sichuan University Jinjiang College, China) and Yinghui Liu (Sichuan University Jinjiang College, China)

Author Index **669**