2022 5th International Conference on Advanced Electronic Materials, Computers and Software Engineering (AEMCSE 2022)

Wuhan, China
22 – 24 April 2022

IEEE Catalog Number: CFP22Y18-POD
ISBN: 978-1-6654-8475-6

Copyright © 2022 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: CFP22Y18-POD
ISBN (Print-On-Demand): 978-1-6654-8475-6
ISBN (Online): 978-1-6654-8474-9

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

2022 5th International Conference on Advanced Electronic Materials, Computers and Software Engineering (AEMCSE)

AEMCSE 2022

Table of Contents

Preface ..... **xxiii**
Committee Members ..... **xxiv**

Research and Development of Advanced Electronic Materials and Smart Appliances

Design of Temperature Monitoring System for Space Environment Simulation and Research Infrastructure Based on EPICS 1
Weiming Tong (Harbin Institute of Technology, China), Ze Xu (Harbin Institute of Technology, China), Xu Chu (Harbin Institute of Technology, China), and Zhongwei Li (Harbin Institute of Technology, China)

Multi-Sensor Fusion Localization and Mapping of Indoor Mobile Robot 7
Zhongwei Hua (Applied Technology College of Soochow University, China) and Dongdong He (Fudan University, China)

Fusion Localization Based on Accuracy Estimation 12
Liansheng He (Dalian University of Technology, China) and Deyue Zou (Dalian University of Technology, China)

Research on Sway Detection Method of Subway Train Based on MEMS Gyroscope Technology 19
Wei Chen (Shanghai Institute of Technology, China), Zhenfeng Cao (Shanghai Institute of Technology, China), Zhe Yang (Shanghai Institute of Technology, China), and Minglai Yang (Shanghai Institute of Technology, China)

Principle and Application of Tunnel Magnetoresistance Current Sensor Against Direct-Current Influence 23
Chunguang Lu (State Grid Zhejiang Electric Power Limited Company Marketing Service Center, China), Lei Song (State Grid Zhejiang Electric Power Limited Company Marketing Service Center, China), Hongyu Ren (Beijing University of Chemical Technology, China), Xuewei Wang (Beijing University of Chemical Technology, China), and Guojun Yuan (Ningbo Taifengyuan Electric Co., Ltd, China)

A Channel Estimation Method of Reference Signal Based on 5g-v2x 30
Sheng Zhang (Shanghai Institute of Technology, China), Hu Liu (Shanghai Institute of Technology, China), Shenglin Xu (Shanghai Institute of Technology, China), and Qingqing Liu (Shanghai Institute of Technology, China)

Research on Design of Railway Supervision and Obstacle Removal Special Vehicle Based on Function Analysis Method 34
Aonan Wei (Guangdong University of Technology, China) and Peng Lu (Xi'an Academy of Fine Arts, China)

Design and Realization of Conductor for Spacecraft Based on Single-Chip Microcomputer 40
Xiaohui Song (Beijing Institute of Spacecraft Environment Engineering, China) and Liang Guo (Beijing Institute of Spacecraft Environment Engineering, China)

Poles Estimation Based on Backward Shift Method 44
Shuang Li (Guangdong Polytechnic of Science and Technology (GDPST), China)

Parallel Convolutional Neural Network Based on Multi-Band Brain Networks for EEG Classification 49
Jing Wang (Guangzhou University, China) and Li Wang (Guangzhou University, China)

Mechanical Properties of Interconnection Interfaces in Micro tin-Silver-Copper Solder Joints 54
Duanpeng He (China Academy of Space Technology, China), Yan Xing (China Academy of Space Technology, China), Xiangtian Yu (China Academy of Space Technology, China), Hong Gao (China Academy of Space Technology, China), Zhiyang Bai (China Academy of Space Technology, China), and Yan Li (China Academy of Space Technology, China)

Abnormal Electricity Detection Method Based on Multi-Dimensional Unsupervised Learning 59
Tianyu Pang (the State Grid Shanghai Municipal Electric Power Company, China), Yi Wu (the State Grid Shanghai Municipal Electric Power Company, China), Naiwang Guo (the State Grid Shanghai Municipal Electric Power Company, China), and Yingjie Tian (the State Grid Shanghai Municipal Electric Power Company, China)

Research on Defect Rotation Detection of Aircraft Flared Tube Based on Improved YOLOv4 64
Jian Zhang (State-owned Wuhu Machinery Factory, China), Kexin Wang (Xidian University, China), Guanbang Dai (State-owned Wuhu Machinery Factory, China), and Ping Zhang (State-owned Wuhu Machinery Factory, China)

Preparation and Performance Test of Magnetorheological Rubber Flexible Abrasive 70
Gan Quan (Shaoyang University, China), Kejun Zhu (Shaoyang University, China), Bin Luo (Shaoyang University, China), and Zhigang Chen (Shaoyang University, China)

Community Structure Enhanced Community Detection Algorithm Based on Graph Compression ... 74
Shuxia Ren (Tianjin Polytechnic Univ., China) and Qinghao Wang (Tianjin Polytechnic Univ., China)

Fuzzy PI Control of Permanent Magnet Synchronous Motor Based on Improved Differential Evolution Algorithm 78
Xuancheng Zhang (Shanghai Institute of Technology, China), Kailiang Long (Shanghai Institute of Technology, China), Ningzhou Li (Shanghai Institute of Technology, China), and Lun Hai (Shanghai Institute of Technology, China)

The Battery Equalization Circuit Based on the Bidirectional Flyback Transformer used for Vehicle Power Battery Packs 83
Danfeng Qiu (Nanjing University of Aeronautics and Astronautics, China), Xiao Ma (Nanjing University of Aeronautics and Astronautics, China), Fen Ge (Nanjing University of Aeronautics and Astronautics, China), Jingdong Zhang (Nanjing University of Aeronautics and Astronautics, China), and Zixia Lin (Nanjing University, China)

Sum Rate Maximization of Millimeter Wave Communication System Assisted by Multiple Intelligent Reflectors 87
Jian Lu (Shanghai DianJi University, China) and Minzheng Li (Shanghai DianJi University, China)

Effect of Sintering Temperature on Electrical Transport Properties of Bi0.5Sb1.5Te3 Thermoelectric Materials 91
Zhiling Bai (Liupanshui Normal University, China) and Bingke Qin (Liupanshui Normal University, China)

Tuning the Electronic and Optical Properties of BaNiO3 via Fe Substitution: a First-Principles Study 95
Jingjing Liu (University of Electronic Science and Technology of China, China), Sa Zhang (University of Electronic Science and Technology of China, China), Haiyan Xiao (University of Electronic Science and Technology of China, China), and Liang Qiao (University of Electronic Science and Technology of China, China)

Comparative Study on Properties of in Situ Particles Reinforced Al-Si-X (Mg, Ti, Ni) Composites by Centrifugal Casting 101
Xuedong Lin (Chongqing Vocational Institute of Engineering, China), Linxian Che (Chongqing Vocational Institute of Engineering, China), Jian Sun (Chongqing Vocational Institute of Engineering, China), and Weibo Li (Chongqing Vocational Institute of Engineering, China)

Pose Estimation for Six-Axis Industrial Robots Based on Pose Distillation 105
Xin Gao (Wuhan Institute of Technology, China) and Deng Chen (Wuhan Institute of Technology, China)

Development of Cobalt-Based Amorphous Soft Magnetic Materials for Fluxgate Sensors 110
Jiaqing Shi (Jilin University, China), Zhijian Zhou (Jilin University, China), Zihao Li (Jilin University, China), and Yanzhang Wang (Jilin University, China)

Research on Digital Frequency Meter Based on Single chip Microcomputer 114
Zhenjun Shao (Hainan University, China)

Preparation and Performance Test of Poly Vinyl Chloride Gel Artificial Muscle 118
Yongfa Tan (Shaoyang University, China), Bin Luo (Shaoyang University, China), Kejun Zhu (Shaoyang University, China), and Gan Quan (Shaoyang University, China)

Multiple Object Tracking in Aerial Vehicle Overhead Video 122
Shaozhe Guo (Engineering University of PAP, China), Youshan Zhang (Engineering University of PAP, China), Yong Li (Engineering University of PAP, China), and Yaojie Wang (Engineering University of PAP, China)

Flexible Photodetectors Based on SiC Nanowires Network on PDMS 127
Zhonghao Li (Northeastern University, China)

Design of Working Stable for Moxibustion Robot Based on Improved TRIZ 132
Zhengyao Yi (Dalian Ocean University, China), Mengyuan Yang (Dalian Ocean University, China), Siyao Mi (Dalian Ocean University, China), and Haoming Li (Nanjing Institute of Technology, China)

Joint Goal for Word Embedding Compression Based on Word Frequency 137
Yunyi Kang (University of Science and Technology of China, China) and Defu Lian (University of Science and Technology of China, China)

A Cross-Layer Attack Path Detection Method for Smart Grid Dynamics 142
Binbin Wang (The State Grid Shanghai Municipal Electric Power Company), Yi Wu (The State Grid Shanghai Municipal Electric Power Company), Naiwang Guo (The State Grid Shanghai Municipal Electric Power Company), Lei Zhang (The State Grid Shanghai Municipal Electric Power Company), and Chang Liu (The State Grid Shanghai Municipal Electric Power Company)

Gating Mechanism Based Feature Fusion Networks for Time Series Classification 147
Junwei Chang (Xi'an Jiaotong University, China) and Li Jin (Xi'an Jiaotong University, China)

A Modified D-LinkNet for Water Extraction from High-Resolution Remote Sensing 151
Xueli Chang (Hubei University of Technology, China), Bo Deng (Hubei University of Technology, China), Zhixi Bao (Hubei University of Technology, China), Xinyi Guo (Hubei University of Technology, China), and Fuxiang Yuan (Hubei University of Technology, China)

UAV Identifies Passable Paths in Unknown Indoor Environments Based on Deep-Learning 157
Hui Li (East China Institute of Computing Technology, China), Bo Jiang (East China Institute of Computing Technology, China), and Hong Xu (East China Institute of Computing Technology, China)

Design and Implementation of Auxiliary System for Automotive Welding Fixture Nnit 163
Weijie Lin (Shanghai University of Engineering Science, China) and Zhenshan Zhang (Shanghai University of Engineering Science, China)

3D Communication System Integrating 3D Reconstruction and Rendering Display 167
Chaoying Zhang (Beijing Research Institute, China Telecom Corporation Limited, China), Minglan Su (Beijing Research Institute, China Telecom Corporation Limited, China), Qiaoqiao Liu (Beijing Research Institute, China Telecom Corporation Limited, China), and Mingchuan Yang (Beijing Research Institute, China Telecom Corporation Limited, China)

Power Internet Assets Security Threat Assessment Based on the Cost of Security Protection 171
Wen Shen (State Grid Key Laboratory of Information & Network Security, China), Qian Guo (State Grid Key Laboratory of Information & Network Security, China), Pengfei Yu (State Grid Key Laboratory of Information & Network Security, China), and Xusheng Liu (State Grid Customer Service Center, China)

Computer Modeling and Modeling Predictive Analysis

Research on Mechanical Sensitivity Response Prediction of Explosives Based on Machine Learning 175
Fanghao Yao (Nanjing University of Science and Techonology, China), Xiongzhu Bu (Nanjing University of Science and Techonology, China), Liangzheng Ding (Nanjing University of Science and Techonology, China), Xinhao Huang (Nanjing University of Science and Techonology, China), and Zouzou Zhang (Xi'an Modern Chemistry Research Institute, China)

Prediction of DNA Methylation Site Status Based on Fusion Deep Learning Algorithm 180
Changde Wu (Shandong Jiaotong University, China), Hai Yang (Shandong Jiaotong University, China), Jinqiang Li (Shandong Jiaotong University, China), Feng Geng (Shandong Jiaotong University, China), Jianguo Bai (Shandong Jiaotong University, China), Chunling Liu (Shandong Jiaotong University, China), and Wenjun Kao (Shandong Jiaotong University, China)

Lung Image Segmentation Based on Involution UNet Model 184
Hongxin Xiao (Guangzhou University, China), Lingxi Peng (Guangzhou University, China), Shaohu Peng (Guangzhou University, China), and Yifan Zhang (Guangzhou University, China)

Driving Behavior Evaluation Based on DBSCAN and Kmeans++ Clustering 188
Ruifeng Wang (Hubei Provincial Key Laboratory of Modern Auto Parts Technology Wuhan University of Technology, China), Wenyuan Zheng (Hubei Provincial Key Laboratory of Modern Auto Parts Technology Wuhan University of Technology, China), Miaohua Huang (Hubei Provincial Key Laboratory of Modern Auto Parts Technology Wuhan University of Technology, China), and Guohang Li (Hubei Provincial Key Laboratory of Modern Auto Parts Technology Wuhan University of Technology, China)

Prediction Model of Urban Epidemic Prevention and Control Based on Multivariate Bi-A-LSTM ... 194
Chang Yuan (University of Science and Technology Beijing, China) and Zhiguo Shi (University of Science and Technology Beijing, China)

Emotional Dialogue Generation with Emotion Embedding 201
Yisheng Miao (Shanghai Maritime University, China) and Lin Zhang (Shanghai Maritime University, China)

Research on the Development Trend Prediction of Steel Material Technology Based on Social Perception Analysis 206
Tan Mao (North China University of Technology, China), Xufeng Li (North China University of Technology, China), Li Zhang (Hebei University of Technology, China), and Qiang Su (North China University of Technology, China)

Predicting the Risk of Stagnation of Citrus in Sichuan 211
Xiaoyue Sun (Chengdu University of Information Engineering), Chuijiang Guo (Chengdu University of Information Engineering), and Xin Huang (Chengdu University of Information Engineering)

Similarity Search Method of Hydrological Time Series Based on Fragment Alignment Distance and Dynamic Time Warping 214
Jiaqi Yang (Hohai University, China), Dingsheng Wan (Hohai University, China), and Yufeng Yu (Hohai University, China)

Yara Rule Enhancement using Bert-Based Strings Language Model 221
Lianqiu Xu (State Key Laboratory of Mathematical Engineering and Advanced Computing, China) and Meng Qiao (State Key Laboratory of Mathematical Engineering and Advanced Computing, China)

The use of Machine Learning in Electric Power Network Intrusion Detection and Network Security Situation Prediction 225
Lei Wang (State Grid Liaoning Electric Power Co., Ltd., China), Jian Chen (Liaoning Electric Power Research Institute of State Grid Corporation of China, China), Hongbi Geng (Liaoning Electric Power Research Institute of State Grid Corporation of China, China), Guangao Li (State Grid Liaoning Electric Power Co., Ltd., China), Liangjin Song (Liaoning Electric Power Research Institute of State Grid Corporation of China, China), and Heyang Sun (Liaoning Electric Power Research Institute of State Grid Corporation of China, China)

Multi-Station Collaborative Analysis of Impending Seismic Precursor Based on Graph Neural Networks 234
Leyuan Chen (Southeast University, China), Yongming Huang (Southeast University, China), Yong Lu (Earthquake Administration of Jiangsu Province, China), Wen Shi (Southeast University, China), Fajun Miao (Earthquake Administration of Jiangsu Province, China), and Hongyu Li (Earthquake Administration of Jiangsu Province, China)

Data Layout Optimization Based on the Spatio-Temporal Model of Field Access 238
Yongliang Wang (University of Science and Technology of China, China), Naijie Gu (University of Science and Technology of China, China), Junjie Su (University of Science and Technology of China, China), Dongsheng Qi (University of Science and Technology of China, China), and Zhuorui Ning (University of Science and Technology of China, China)

Genomic Structure Variation Prediction Method Based on Convolution and Recurrent Network ... 245
Jinqiang Li (Shandong Jiaotong University, China), Hai Yang (Shandong Jiaotong University, China), Feng Geng (Shandong Jiaotong University, China), and Changde Wu (Shandong Jiaotong University, China)

DC-Link Stable Control Method Based on Current Model Predictive Control for PMSM Film-Capacitor Drive System 249
Jingwei Niu (Zhengzhou Electromechanical Engineering Research Institute, China), Yawei Hou (Zhengzhou Electromechanical Engineering Research Institute, China), Chunyan Li (Zhengzhou Electromechanical Engineering Research Institute, China), Xiaoduo Zhang (Zhengzhou Electromechanical Engineering Research Institute, China), and Shouhu Cheng (Zhengzhou Electromechanical Engineering Research Institute, China)

Binary Vulnerability Mining Technology Based on Neural Network Feature Fusion 257
Wenjie Han (State Key Laboratory of Mathematical Engineering and Advanced Computing, China), Jianmin Pang (State Key Laboratory of Mathematical Engineering and Advanced Computing, China), Xin Zhou (State Key Laboratory of Mathematical Engineering and Advanced Computing, China), and Di Zhu (State Key Laboratory Of Mathematical Engineering and Advanced Computing, China)

Multimodal Sentiment Analysis Based on Multi-Head Self-Attention and Convolutional Block Attention Module 262
Feng Geng (Shandong Jiaotong University, China), Hai Yang (Shandong Jiaotong University, China), Changde Wu (Shandong Jiaotong University, China), and Jinqiang Li (Shandong Jiaotong University, China)

Research on the Evaluation Method of Virtual Clothing Pressure Comfort Based on Fuzzy Clustering 267
Gengtian Hu (Dalian Polytechnic University, China), Chao Gao (Dalian Polytechnic University, China), Baohe Zhao (Dalian Polytechnic University, China), Jianing Liu (Dalian Polytechnic University, China), and Tong Yao (Dalian Polytechnic University, China)

Research on Ship Tracking and Control for COVID-19 Epidemic Prevention Based on Multi-Source Information Fusion 272
Taizhi Lv (Jiangsu Maritime Institute, China), Yujuan Zou (Jiangsu Maritime Institute, China), and Peiyi Tang (Nanjing Huihai Transportation Technology Company Limited, China)

Deep Reinforcement Learning Method of UAV Behavior Planning for Optimizing Geometric Dilution Precision Distribution 276
Jingyan Huang (National University of Defense Technology, China), Zhengquan Tao (National University of Defense Technology, China), and Jun He (National University of Defense Technology, China)

SIR Model Considering Influence of Network Rumor Propagation 281
Jiusheng Mu (Shandong Normal University, China) and Fengming Liu (Shandong Normal University, China)

Quality Control and Traceability System Based on Block Chain 285
Qiyuan Wang (Ningbo University of Finance and Economics, China), Muhong Zheng (Ningbo University of Finance and Economics, China), Xie Ma (Ningbo University of Finance and Economics, China), and Jun Huang (Ningbo University of Finance and Economics, China)

Short-Term Traffic Flow Prediction Based on Multi-Machine Learning 289
Mingsheng Liu (Jiangxi Traffic Monitoring Command Center, China)

Deep Learning Based on byte Sample Entropy for VPN Encrypted Traffic Identification 293
Yajuan Wang (State Grid Customer Service Center, China), Gengshen Yu (State Grid Key Laboratory of Information & Network Security, China), Wen Shen (State Grid Key Laboratory of Information & Network Security, China), and Lintan Sun (State Grid Customer Service Center, China)

Short Texts Classification Based an Improved BiLSTM 297
Pei Pei (National University, China)

Insurance Product Recommendation Based on Neural Network 301
Hongxia Wang (Anhui Xinhua University, China) and Haopeng Yu (Anhui Xinhua University, China)

Expectation-Constrained Programming Model for Tourist Route of Attractions Based on Uncertainty Theory 305
Zheng Huang (Shandong Normal University, China), Yufu Ning (Shandong Youth University of Political Science, China), and Fengming Liu (Shandong Normal University, China)

Overhead Transmission Lines Early Warning and Decision Support System with Predictive Analytics 310
Weihua Yin (St. Paul University Philippines, Philippines; Shaoyang University, China), Maria Visitacion N. Gumabay (St. Paul University Philippines, Philippines), Haili Lin (Beijing Century Lily Technology Co., Ltd., China), Chengen Tu (Beijing Century Lily Technology Co., Ltd., China), and Chun Ao (Beijing Century Lily Technology Co., Ltd., China)

Research of Heart Disease Prediction Based on Machine Learning 315
Shuge Ouyang (University of Minnesota Twin City, USA)

Price Forecasting and Quantitative Trading Strategy Based on Ensemble Forecaster 320
Zijie Wang (Sun Yat-sen University, China), Zhule Liu (Sun Yat-sen University, China), and Hongfu Li (Sun Yat-sen University, China)

Prediction of Used Car Price Based on LightGBM 327
Han Zhang (Zhengzhou University, China)

Predicting the Intention of Online Shoppers' Purchasing 333
Guankai Sang (Boston University) and Siyuan Wu (Wenzhou-Kean University)

Prediction Model for Transmission Line Icing Thickness Based on ISSA-WNN 338
Handong Dan (NARI Group Corporation, State Grid Electric Power Research Institute, China), Bo Hu (NARI Group Corporation, State Grid Electric Power Research Institute, China), Xiang Shen (Shaoxing Power Supply Company, Zhejiang Electric Power Corporation, Zhejiang), Hailin Liao (Shaoxing Power Supply Company, Zhejiang Electric Power Corporation, Zhejiang), and Hongyu Ni (Shaoxing Power Supply Company, Zhejiang Electric Power Corporation, Zhejiang)

A Multi-Step Time Series Prediction Strategy in Deep Learning: Combination of Recursive Strategy and Multi-Output by Dense Layer Strategy 343
Yuxuan Liu (University of Electronic Science and Technology of China, China)

A Transformer-Based Longer Entity Attention Model for Chinese Named Entity Recognition in Aerospace 348
Shuai Gong (Technology and Engineering Center for Space Utilization; University of Chinese Academy of Sciences), Xiong Xiong (Technology and Engineering Center for Space Utilization; University of Chinese Academy of Sciences), Yunfei Liu (Technology and Engineering Center for Space Utilization; University of Chinese Academy of Sciences), Shengyang Li (Technology and Engineering Center for Space Utilization; University of Chinese Academy of Sciences), and Anqi Liu (Technology and Engineering Center for Space Utilization)

Research on Rebar Counting Based on YOLO-Rebar Model 356
Haijun Wang (China Construction Fourth Engineering Division Corp. Ltd, China), Minjian Long (China Construction Fourth Engineering Division Corp. Ltd, China), Jianchun Wang (China Construction Fourth Engineering Division Corp. Ltd, China), and Congcong Guan (China Construction Fourth Engineering Division Corp. Ltd, China)

Research on the Embedded Mathematical Model of Artificial Intelligence Measurement 362
Xiujian Zhang (Beijing Aerospace Institute for Metrology and Measurement Technology, China), Jing Sun (Beijing Aerospace Institute for Metrology and Measurement Technology, China), Zhonghao Cheng (Beijing Aerospace Institute for Metrology and Measurement Technology, China), and Haoyi Chen (Beijing Aerospace Institute for Metrology and Measurement Technology, China)

Research on Several Major Diseases Based on Machine Learning Models 367
Wentao Gao (Hong Kong University of Science and Technology, China) and Lijing Liu (The University of Sydney)

Research on Pest Propagation Based on Auto-Regressive and Moving Average Model Algorithm .. 374
Linlin Li (Wuhan University of Science and Technology, China), Binbin Dan (Wuhan University of Science and Technology, China), Ying Li (Wuhan University of Science and Technology, China), and Wei Wang (Wuhan University of Science and Technology, China)

Different Machine Learning Methods for tic-tac-toe Prediction 379
Supeng Wu (University of New South Wales, Australia)

Classification Efficiency of LassoNet Model in Image Recognition 384
Xingkai Wen (Northeast Normal University, China) and Zhij Yang (Yunnan University of Finance and Economics, China)

Drug Purchase Prediction Model Algorithm 392
Jin-Rong Liu (Inner Mongolia University of Technology, China), Xing-Yu Wu (Inner Mongolia University of Technology, China), and Yong-Xiang Feng (Inner Mongolia University of Technology, China)

Tic-tac-toe Prediction Based on Machine Learning Methods 397
Tianxiao Wu (Beijing University of Technology, Beijing) and Cixiu Yu (The University of Adelaide, Australia)

Remote Sensing Image Segmentation Model Based on Attention Mechanism 403
Hanting Wang (Hunan University, China)

Research on Guilin Tourism Network Attention Based on Baidu Index 406
Xi Du (Guilin University of Technology School, China)

A Double-Layer Attention Heterogeneous Graph Neural Network Based on Coupled P System 411
Jiaqi Zhang (Shandong Normal University, China) and Xiyu Liu (Shandong Normal University, China)

How Crowd Anxiety Affects Emergency Evacuations Based on Cellular Automata 418
Kunqi Han (Hohai University, China), Wei Zhang (Hohai University, China), and Yuzi Zhang (Hohai University, China)

Recent Works for Sentiment Analysis using Machine Learning and Lexicon Based Approaches 422
Qinze He (Hunan university, China)

Meta-Learning Based Heterogeneous Graph Attention Network for Top-N Review Recommendation . 427
Shuwei Wang (Sun Yat-Sen University, China; Guangdong Key Laboratory of Big Data Analysis and Processing, China), Wei Liu (Sun Yat-Sen University, China; Guangdong Key Laboratory of Big Data Analysis and Processing, China), and Jian Yin (Sun Yat-Sen University, China; Guangdong Key Laboratory of Big Data Analysis and Processing, China)

Deep Methods Based on GAN for Face-Spoofing 433
Lianghong Chen (Western University, Canada), Wenkai Li (Northeastern University, China), and Leyi Zhang (The University of Melbourne Grattan Street, Australia)

Evaluation Method of Medical Students' Public English Learning Engagement Based on Machine Learning 438
Hang Dai (Qiqihar Medical University, China) and Tianyu Zhao (Qiqihar Medical University, China)

A Construction Method of Knowledge Graph for Electric Power Field 444
Bo Zhang (State Grid Anhui Electric Power Co., Ltd, China), Xiaoping Chen (University of Science and Technology of China, China), Yu Ouyang (State Grid Anhui Electric Power Co., Ltd., China), Yeping Gan (State Grid Anhui Electric Power Co., Ltd., China), Bin Lyu (State Grid Anhui Electric Power Co., Ltd., China), Huizhou Liu (State Grid Anhui Electric Power Co., Ltd, China), and Chenguang Li (University of Science and Technology of China, China)

Ensemble Learning Based Models for House Price Prediction, Case Study: Miami, U.S. 449
Xiuyuan Wu (New York University, USA) and Bohan Yang (Beihang University, China)

Passenger flow Forecast of new Urban rail Transit Lines 459
Linjie Zhang (Zhengzhou University) and Hongxing Pei (Zhengzhou University)

Evaluation of the Market Acceptance of Vehicles with Random Forest 464
Junlu Li (James Cook University, Singapore) and Yuxing Wei (University of Wisconsin, USA)

Velocity Planning of Automatic Driving Based on Fuzzy Neural Network 470
Hong-Yao Li (Southeast University)

Data Mining and Image Algorithms Object Detection

TNM-LPA: An Improved Label Propagation Algorithm Based on Three-Nodes Motif Mining 475
Yuan Li (Shandong Normal University, China) and Jianhua Qu (Shandong Normal University, China)

A Study of Answer Selection Task Based on Deep Learning Methods 479
Na Wang (Shenzhen University, China), Ruoyan Chen (Shenzhen University, China), and Kunming Du (Shenzhen University, China)

Neural Network Sliding Mode Control Based on Improved Fruit-fly Optimization Algorithm for Permanent Magnet Synchronous Motor Systems 488
Kailiang Long (Shanghai Institute of Technology, China), Xuancheng Zhang (Shanghai Institute of Technology, China), Zepeng Xi (Shanghai Institute of Technology, China), and Ningzhou Li (Shanghai Institute of Technology, China)

Application and Research of Small Object Detection in Oil Field 492
Huaizhou Yang (Xi' an Shiyou University, China) and Chenzhuo Liu (Xi' an Shiyou University, China)

The Shortest Route of Material Transportation and Optimal Capital Savings Design Based on Floyd Algorithm 497
Xingze Zhang (Tianjin Agricultural University, China), Zekun Chen (Tianjin Agricultural University, China), Liyan Xu (Tianjin Agricultural University, China), and Xuetao Yan (Tianjin Agricultural University, China)

Emergency Rescue Action Recognition Algorithm Based on Recurrent - Adaptive Graph Convolutional Networks 501
Zhi Hu (University of Science and Technology Beijing, China) and Zhiguo Shi (University of Science and Technology Beijing, China)

Carousel Path Optimization Based on Hybrid Particle Swarm Optimization Algorithm 509
Jun-Yu Duan (Naval University of Engineering, China) and Wan-Zhi Rui (Naval University of Engineering, China)

CNN-Based Bronze Inscriptions Character Recognition 514
Xuanqi Wu (East China Normal University, China), Ziyang Wang (East China Normal University, China), and Peng Ren (East China Normal University, China)

Network Intrusion Detection Based on Improved CNN 520
Shiyu Wang (Nanchang Hangkong University, China), Zilong Yang (Nanchang Hangkong University, China), and Anyi Xiao (Nanchang Hangkong University, China)

An Active Queue Management Algorithm to Enhance RED Stability 524
Debin Wei (Dalian University, China), Xuechun Zheng (Dalian University, China), Zuoren Yan (Dalian University, China), and Ruiyan Cai (Taizhou University, China)

Python-Based Data Mining and Analysis 530
Junlin Chen (Beijing Institute of Graphic Communication School of Information Engineering, China), Hongjuan Wang (Beijing Institute of Graphic Communication School of New Media, China), Chang Liu (Beijing Institute of Graphic Communication School of Information Engineering, China), and Jianchang Zheng (Beijing Institute of Graphic Communication School of Information Engineering, China)

A Statistical Method for the Number and Size of Luminescent Zooplankton in Deep Sea 537
Yulong Zhou (Shanghai University, China), Xi Zhang (Shanghai University, China), Yuxing Wang (Shanghai University, China), and Fei Zhao (Shanghai University, China)

Research on Parametric Optimization of Daylighting in University Teaching Building 541
Meng Wang (Nanjing University, China), Da-Xing Chen (Shihezi University, China), Zi-He Zhang (Shihezi University, China), Qiang Ma (Ordos Vocational College, China), and Yu-Cheng Ren (Shihezi University, China)

An Improved k-Means Clustering Collaborative Filtering Recommendation Algorithm 545
Xiaoying Ye (Guangdong Neusoft Institute, China) and Tang Rong (Chongqing Center for Disease Control and Prevention, China)

Infrared and Visible Image Fusion Algorithms Based on Generative Adversarial Networks 549
Wen-Hua Zhuang (Space Engineering University, China), Xiao-Gang Tang (Space Engineering University, China), Binquan Zhang (Space Engineering University, China), and Guang-Ming Yuan (Space Engineering University, China)

Adaptive Scheduling Algorithm Based on Time Aware Shaper 555
Haisheng Wang (Army Academy of Armored Forces, China), Zixu Zhao (Army Academy of Armored Forces, China), and Jian Wei (Army Academy of Armored Forces, China)

SVD Based Image Actual Resolution Estimation 563
Shiqiang Zheng (Huazhong University of Science and Technology, China), Lizhe Duan (Huazhong University of Science and Technology, China), Wenguang Hou (Huazhong University of Science and Technology, China), and Dzmitry Kurlovich (Belarusian State University, Belarus)

Security Attack Situation Awareness Based on Massive log Data Mining 567
Yin Xu (State Grid Customer Service Center, China), Pengfei Yu (State Grid Key Laboratory of Information & Network Security, China), Wen Shen (State Grid Key Laboratory of Information & Network Security, China), and Ziqian Li (State Grid Customer Service Center, China)

An Optimization Algorithm for Adjusting Link State using 5G CSI Mechanism in Vehicle-to-Vehicle Communication 571
Qingqing Liu (Shanghai Institute of Technology, China), Hu Liu (Shanghai Institute of Technology, China), Shenglin Xu (Shanghai Institute of Technology, China), and Sheng Zhang (Shanghai Institute of Technology, China)

A Data-Assisted Adaptive Detection Algorithm for Shortwave Burst Signals 575
Yi Wei Feng (PLA Strategic Support Force Information Engineering University, China), Wen Zhong Qu (National Key Laboratory of Science and Technology on Blind Signal Processing, China), Yan Zhao (National Key Laboratory of Science and Technology on Blind Signal Processing, China), and Yu Mei Zhou (PLA Strategic Support Force Information Engineering University, China)

Vocabulary Enhancement in Chinese-Named Entity Recognition 581
Li-Chen Xu (Nanchang Institute of Technology, China), Xue-Feng Fu (Nanchang Institute of Technology, China), Yu Wu (Nanchang Institute of Technology, China), and Qian-Hui Gu (Nanchang Institute of Technology, China)

Dual Attention Based Convolutional Neural Network with Scattering Transform Features for Hyperspectral Unmixing 587
Baohua Jin (Zhengzhou University of Light Industry, China), Yunfei Zhu (Zhengzhou University of Light Industry, China), Wei Huang (Zhengzhou University of Light Industry, China), and Sijia Li (Zhengzhou University of Light Industry, China)

Competition Quota Allocation Based on Analytic Hierarchy Process and Data Processing and Prediction Combined with Clustering Method 593
Qiaohui Han (Tianjin Agricultural University, China), Xinping Zhang (Tianjin Agricultural University, China), Liyan Xu (Tianjin Agricultural University, China), and Junqi Zhang (Tianjin Agricultural University, China)

Bridge Crack Detection Based on Image Segmentation 598
Suqin Wu (South China Normal University, China), Aimin Xiong (South China Normal University, China), Xusong Luo (SCNU Qingyuan Institute of Science and Technology Innovation Co., Ltd., China), and Jinghao Lai (Qingyuan Huayun Smart Control Technology Co., Ltd, China)

Storage Analysis of Big Data Based on Hadoop 602
Jianchang Zheng (Beijing Institute of Graphic Communication, China), Chang Liu (Beijing Institute of Graphic Communication, China), Hongjuan Wang (Beijing Institute of Graphic Communication, China), and Junlin Chen (Beijing Institute of Graphic Communication, China)

Research on Algorithm of Laser Spot Center Positioning in Track Subsidence Monitoring System 608
Zepeng Xi (Shanghai Institute of Technology, China), Zhenfeng Cao (Shanghai Institute of Technology, China), Zhe Yang (Shanghai Institute of Technology, China), and Minglai Yang (Shanghai Institute of Technology, China)

An Improved Density Peak Clustering Algorithm Based on K Nearest Neighbors and Tissue-Like P System 612
Fuhua Ge (Shandong Normal University, China) and Xiyu Liu (Shandong Normal University, China)

A Joint Detection Algorithm of Integer Frequency Offset Estimation and Cell ID Based on 5G-NR-V2X 618
Shenglin Xu (Shanghai Institute of Technology, China), Hu Liu (Shanghai Institute of Technology, China), Sheng Zhang (Shanghai Institute of Technology, China), and Qingqing Liu (Shanghai Institute of Technology, China)

Teaching-Learning-Based Optimization Algorithm Based on Cauchy Reverse and Cross Selection.. 624
Feng Deng (Shanghai Maritime University, China), Dan Zhao (Logistics Research Center, China), and Qingyan Li (Shanghai Maritime University, China)

Research on Mask Wearing Detection Based on Faster RCNN 629
Yahui Ding (Beijing Institute of Graphic Communication, China), Chang Liu (Beijing Institute of Graphic Communication, China), Hongjuan Wang (Beijing Institute of Graphic Communication, China), and Zhengjian Chang (Beijing Institute of Graphic Communication, China)

An Improved Weighted Centroid Localization Algorithm Based on Zigbee 634
Lun Hai (Shanghai Institute of Technology, China), Zhe Yang (Shanghai Institute of Technology, China), Zhenfeng Cao (Shanghai Institute of Technology, China), and Minglai Yang (Shanghai Institute of Technology, China)

Tor Traffic's Representation and Classification Based on Packet Timing Characteristics 638
Haozhan Yin (People's Public Security University of China, China), Jinxuan Cao (People's Public Security University of China, China), Shouzhi Jiang (People's Public Security University of China, China), and Tianliang Lu (People's Public Security University of China, China)

Similar Duplicate Record Detection of Big Data Based on Entropy Grouping Clustering 646
Ping Zhang (Anhui Vocational and Technical College, China)

Fingertip Detection Based on Freeman Chain Code Analysis 651
Yihong Wang (Hohai University, China) and Jiaming Wang (Hohai University, China)

Clustering-Based Interference Suppression Algorithm for UWB Localization 655
Di Luo (Space Engineering University, China), Zhi Li (Space Engineering University, China), Jishun Li (Space Engineering University, China), and Xinli Zhu (Space Engineering University, China)

Smart Fault Diagnosis of Rotating Machinery with Analytics using Deep Learning Algorithm 660
Guoye Liang (Guangdong University of Petrochemical Technology, China), Maria Visitacion N. Gumabay (St. Paul University Philippines, Philippines), Qinghua Zhang (Guangdong University of Petrochemical Technology, China), and Guanhua Zhu (Guangdong University of Petrochemical Technology, China)

Quantum Genetic Algorithm Optimized BP Neural Network for high-Resolution Remote Sensing Image Classification 666
Zhihan Chen (Guilin University of Technology, China), Bo Wei (Guilin University of Technology, China), and Yongyu Chen (Guilin University of Technology, China)

Division of Dataset into Training and Validation Subsets by the Jackknife Validations to Predict the pH Optimum for Beta-Cellobiosidase 671
Shaomin Yan (Guangxi Academy of Sciences, China) and Guang Wu (Guangxi Academy of Sciences, China)

Machine Learning and Ensemble Learning for Transcriptome Data: Principles and Advances 676
Zijie Wang (Sun Yat-sen University, China), Yi Jiang (Yangzhou University, China), Zhule Liu (Sun Yat-sen University, China), Xinqiang Tang (Sun Yat-sen University, China), and Hongfu Li (Sun Yat-sen University, China)

Recommendation Algorithm Based on Relative Features 684
Xuan Wang (Beijing University of Technology, China), Cui Zhu (Beijing University of Technology, China), Wenjun Zhu (Beijing University of Technology, China), and Bingxin Xue (Beijing University of Technology, China)

Alleviating Sparsity Problem of Recommender System with No Extra Input Data 691
Hao Wang (Ratidar.com)

Multi-Perspectives 2D Spine CT Images Segmentation of 3D Fuse Algorithm 696
Jiali Cui (Qinghai University, China), Dedong Gao (Qinghai University, China), Yan Zhao (Qinghai University, China), Linze Wang (Qinghai University, China), and Xin Peng (Qinghai University, China)

Helmet wear Detection Based on EfficientNet-Y 704
Jie Liu (Wuhan Institute of Technology) and Lizhi Liu (Wuhan Institute of Technology)

VadTR: Video Anomaly Detection with Transformer 711
Zexu Du (Artificial Intelligence on Electric Power System State Grid Corporation Joint Laboratory, China), Guoliang Zhang (Artificial Intelligence on Electric Power System State Grid Corporation Joint Laboratory, China), Jinrui Gan (Artificial Intelligence on Electric Power System State Grid Corporation Joint Laboratory, China), Chunpeng Wu (Artificial Intelligence on Electric Power System State Grid Corporation Joint Laboratory, China), and Xin Liu (State Grid Anhui Ultra High Voltage Company, China)

RESEARCH on Route Selection of Urban rail Passengers Based on AFC data 715
Hesong Han (Zhengzhou University) and Hongxing Pei (Zhengzhou University)

Machine Learning Based on Association Rules About Automatic Course Data Mining 719
Xuemei Li (Anhui Sanlian University) and Jiajia Xu (Anhui Sanlian University)

High Resolution Remote Sensing Image Classification Based on Mind Evolutionary Algorithm Optimized BP Neural Network 723
Chang Wei (Guilin University of Technology, China), Bo Wei (Guilin University of Technology, China), and Caijuan Zhang (Guilin University of Technology, China)

Multi-Scale Local Feature Fusion Network for Facial Expression Recognition 728
Xusong Luo (South China Normal University, China), Jie Xiao (Qingyuan HuaYun Smart Control Technology Co., Ltd, China), Aimin Xiong (South China Normal University, China), and Hongbin Zhang (SCNU Qingyuan Institute of Science and Technology, China)

A Multi-Feature Speech Emotion Recognition Method Based on Temporal Pyramid Pooling 732
Meng Huang (Henan University of Science and Technology, China), DanMei Niu (Henan University of Science and Technology, China), and ZhiYong Zhang (Henan University of Science and Technology, China)

Sentiment Analysis of Electric Power Domain Based on Transfer Learning 738
Bo Zhang (State Grid Anhui Electric Power, China), Xiaoping Chen (University of Science and Technology of China, China), Yu Ouyang (State Grid Anhui Electric Power, China), Yeping Gan (State Grid Anhui Electric Power, China), Bin Lyu (State Grid Anhui Electric Power, China), Qian Zhao (State Grid Anhui Electric Power, China), and Chenguang Li (University of Science and Technology of China, China)

Simultaneous Localization and Mapping with Semantic Landmarks 743
Xiaotian Chen (Dalian University of Technology, China)

Intelligent Software Design and Software Collaboration Analysis

Design and Implementation of Online Judgment System Based on Microservice Architecture and Docker 749
Junshang Liang (Chengdu University of Technology, China) and Chunyu Tu (Chengdu University of Technology, China)

Improvement of Cold Chain Transportation Client Based on Improved Mediator Pattern 754
Hao Chen (Guangdong Ocean University, China), Taoli Liu (Guangdong Ocean University, China), Zhenming Li (Guangdong Ocean University, China), and Litao Cao (Guangdong Ocean University, China)

An Automatic Evaluation and Optimization Model for Port Data Analysis System 761
Wenpeng Lang (China University of Geosciences, China)

Smart Household Waste Classification System using Artificial Intelligence 766
Zhusen Liang (Guangdong University of Petrochemical Technology, China) and Maria Visitacion N. Gumabay (St. Paul University Philippines, Philippines)

Echo Chamber Super-Network in Online Social Media 772
Yingping Sun (Shandong Normal University, China) and Fengming Liu (Shandong Normal University, China)

Research and Implementation of ARP Attack Defense Software Based on SharpPcap 776
Wu Cheng (Anhui University, China), Kaiwen Yao (Anhui University, China), Jibin Yuan (Anhui University, China), and Xiaoping Huang (Anhui University, China)

A Reconfigurable Software Framework for Radar Information Processing 781
Weiyong Tong (Nanjing Marine Radar Institute, China), Jingjiao Wang (Nanjing Marine Radar Institute, China), Pengfei Liu (Nanjing Marine Radar Institute, China), and Zhihui Ding (Nanjing Marine Radar Institute, China)

A Real-Time Calculation Platform of Ship air Pollutant Emission Based on Flink 785
Juan Zhang (Jiangsu Maritime Institute, China), Peiyi Tang (Nanjing Huihai Transportation Technology Company Limited, China), and Taizhi Lv (Nanjing Huihai Transportation Technology Company Limited, China)

Research on Visual art Design of Children's Picture Books Based on Augmented Reality Technology 789
Peng Fu (Changchun Humanities and Sciences College, China)

Design and Implementation of Metaverse Game Link Emotions Sharing System Based on the APP Android 794
Minchuan Huang (Guangdong University of Petrochemical Technology, China), Xingtong Zhu (Guangdong University of Petrochemical Technology, China), Shunbo Xiang (Guangdong University of Petrochemical Technology, China), Hui Xu (Guangdong University of Petrochemical Technology, China), Guoquan Wang (Guangdong University of Petrochemical Technology, China), and Aiguo Wang (Guangdong University of Petrochemical Technology, China)

Design and Implementation of an Online Registration System Based on Siemens Low-Code Platform 798
Xin Liu (Shanghai Polytechnic University, China) and Wenhua Zhu (Shanghai Polytechnic University, China)

McSPI Design and Verification 802
Biyang Zhang (China Electronics Technology Group, China), Minhua Ren (China Electronics Technology Group, China), Fuzhi Zhang (China Electronics Technology Group, China), and Jie Xiao (China Electronics Technology Group, China)

Research and Analysis of Recommendation Technology 806
Chang Liu (Beijing Institute of Graphic Communication, China), Hongjuan Wang (Beijing Institute of Graphic Communication, China), Mengbei Yu (Beijing Institute of Graphic Communication, China), and Jianchang Zheng (Beijing Institute of Graphic Communication, China)

Research on Credit Label Construction Based on Electricity Big Data 813
Naiwang Guo (State Grid Shanghai Electric Power Company, China), Yingying Zhao (State Grid Shanghai Electric Power Company, China), Yun Su (State Grid Shanghai Electric Power Company, China), Yi Wu (State Grid Shanghai Electric Power Company, China), and Yingjie Tian (State Grid Shanghai Electric Power Company, China)

Development of a Lightweight Software Engineering Laboratory Management System Based on Scrum 818
Jiujiu Yu (Anhui Sanlian University, China), Jishan Zhang (Anhui Sanlian University, China), Yun Chen (Anhui Sanlian University, China), Ning Wu (Anhui Sanlian University, China), Yingying Mei (Anhui Sanlian University, China), and Wenling Sun (Anhui Sanlian University, China)

Improvement of Collaborative Filtering Algorithm Based on University Book Recommendation System 822
Xuejing Ding (Anhui San University, China) and Lei Tang (Anhui San University, China)

Research on two-Dimensional Intelligent Nesting Based on Sarsa-Learning 826
Jie Fang (Huazhong University of Science and Technology, China), Yunqing Rao (Huazhong University of Science and Technology, China), Wei Ding (Huazhong University of Science and Technology, China), and Ronghua Meng (China Three Gorges University, China)

Applying MLP and CNN on Handwriting Images for Image Classification Task 830
Chang Xu (Science College, Northeastern University, China)

Research on Consumer Service Quality Based on Hotel Online Reviews 836
Yutong Lu (Guilin University of Technology School, China), Yanling Huang (Guilin University of Technology School, China), Haitao Yu (Guilin University of Technology School, China), and Yu Lan (Guilin University of Technology School, China)

Research on Automatic Text Summarization Technology Based on ALBERT-TextRank 841
Yuxiao Shi (DaLian Maritime University, China), Bin Zhu (DaLian Maritime University, China), and Guanyu Li (DaLian Maritime University, China)

A Survey on Multimodal Dialogue Systems: Recent Advances and New Frontiers 845
Guangya Liu (Sun Yat-sen University, China), Shiqi Wang (Sun Yat-sen University, China), Jianxing Yu (Sun Yat-sen University, China), and Jian Yin (Sun Yat-sen University, China)

Research on Holographic Communication System Based on 3D Face Reconstruction 854
Minglan Su (Beijing Research Institute, China Telecom Corporation Limited, China), Chaoying Zhang (Beijing Research Institute, China Telecom Corporation Limited, China), Qiaoqiao Liu (Beijing Research Institute, China Telecom Corporation Limited, China), and Mingchuan Yang (Beijing Research Institute, China Telecom Corporation Limited, China)

Author Index **859**