2019 11th International Conference on Measuring Technology and Mechatronics Automation (ICMTMA 2019)

Qiqihar, China
28 – 29 April 2019

IEEE Catalog Number: CFP1913G-POD
ISBN: 978-1-7281-2166-6

Copyright © 2019 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:	CFP1913G-POD
ISBN (Print-On-Demand):	978-1-7281-2166-6
ISBN (Online):	978-1-7281-2165-9
ISSN:	2157-1473

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

2019 11th International Conference on Measuring Technology and Mechatronics Automation (ICMTMA)

ICMTMA 2019

Table of Contents

Preface ..... **xxii**
Committees ..... **xxiii**

Session 1: Digital Manufacturing and Design

Analysis of Key Technology Application of Computer Multimedia Technology 1
Yunxiang Zhang (Jiamusi University Business School), Yunpeng He (Jiamusi Radio and Television Station), and Shengcan Jin (Jiamusi University Business School)

Analysis on Differential Thermal Calculation Mode and Sunshine Temperature Difference Effect of Box Beam of the Extra-Long Longtan River Bridge 6
Canbin Yin (Hunan City University) and Fang Yu (Hunan ProKey Real Estate Gruop Limited)

Design and Implementation of Core Modules of WEB Application Vulnerability Detection Model 10
Wang Ze (Wuhan Business University)

Design and Implementation of Core Processing System for Smart Home Control 15
Xingjuan Wang (WuHan HuaXia University of Technology) and Mengfan Liang (WuHan HuaXia University of Technology)

Design and Implementation of Glue Supply Control System Based on Fuzzy Pid 19
Chen Mingxia (Guilin University of Technology), Zheng Haitao (Guilin University of Technology), and Liang Zhifen (Guilin University of Technology)

Design and Implementation of Intelligent Construction Engineering Information Management System 23
Honglie Jiang (Liaoning Jianzhu Vocational College)

Design and Implementation of Intelligent Control System for Green Building 28
Dehao Gao (Liao Ning Jian Zhu Vocational College)

Design and Implementation of Intelligent Financial Data Mining and Analysis System Based on Web 32
Shen Chang-Fu (Hohai University)

Design and Implementation of Intelligent Physique Health Monitoring System Under Android Platform 36
Zhiling Chen (University of South China)

Design and Implementation of Volleyball Training and Analysis System Based on Network 40
Qiang Fu (Guangzhou Sport University)

Design and Realization of Tablet Computer Based on Hades Canyon NUC 45
Chuanfei Qiu (Arm Engineering University of PLA), Xiaofang Lou (Arm Engineering University of PLA), Weiqing Tian (Arm Engineering University of PLA), Huiyu Nie (Arm Engineering University of PLA), and Jingjing Zhou (Arm Engineering University of PLA)

Design and Testing of Transplanting Hole-Forming Machine for Potted Rapeseed Seedlings 49
Xiang Wei (Hunan Agricultural University), Wu Mingliang (Hunan Agricultural University), Lyu Jiangnan (Chinese Academy of Agricultural Sciences), Ma Lan (Chinese Academy of Agricultural Sciences), Quan Wei (Hunan Agricultural University), and Liu Jiajie (Chinese Academy of Agricultural Sciences)

Design of Ship Trajectory Analysis and Application System Based on AIS 57
Yuan Junfu (Jiangsu Maritime Institute)

Hybrid Techniques for Identity Authentication 62
Yongjian Zhao (Shandong University) and Rui Guo (Shandong University)

Impact Fracture Simulations of Automotive Laminated Glass: The Two Extrinsic Cohesive Models 66
Di Wang (South China University of Technology) and Mengyan Zang (South China University of Technology)

Innovative Design of Environmental Art Dependent on Big Data Pattern Learning Optimization Cultural Algorithm 70
Naijing Lin (Shanghai University)

Lane Keeping of Intelligent Vehicle with Man-Machine-Coordination 74
Li Jin (Anhui Science and Technology University)

Research in Fast Modular Exponentiation Algorithm Based on FPGA 79
Shu Li (State Grid Hunan Electric Power Corporation Research Institute), Jianwei Tian (State Grid Hunan Electric Power Corporation Research Institute), Hongyu Zhu (State Grid Hunan Electric Power Corporation Research Institute), Zheng Tian (State Grid Hunan Electric Power Corporation Research Institute), Hong Qiao (State Grid Hunan Electric Power Corporation Research Institute), Xi Li (State Grid Hunan Electric Power Corporation Research Institute), and Jie Liu (State Grid Hunan Electric Power Corporation Research Institute)

Research on De-Noising Method of Railway Vehicle Noise Signal 83
Wang Jinhua (Wuhan Railway Vocational College of Technology)

Research on Function Test Method of Assistant Design Software Based on Cloud Computing 88
Wei Yunhua (Wuhan City Vocational College)

Research on Innovation of Science Fiction Film with Intelligent Equipment 95
Huang Tianle (Communication University of China)

Research on the Application of Information Graphization and Gray Level Analysis in Web Visual Communication Design 99
Yizhi Qiu (Southwest University of Science and Technology)

Study on Length of Cable-Free Zone of Cable-Stayed Bridge in Mountainous Area Under Live Load 103
Tie-Dong Qi (China-Road Transportation Verification & Inspection Hi-Tech Co., Ltd.), Fu Wang (Wuhan Institute of Technology), and Yun Yang (Ministry of Transport)

The High Spatial Resolution Demodulation Method of FBGs Based on the Section Demodulation and OTDR .. 107
Honghai Wang (Key Laboratory of Fiber Optic Sensing Technology and Information Processing), Xiaojiao Li (Wuhan University of Technology), Yuan Feng (Wuhan University of Technology), Wentao Hu (Wuhan University of Technology), and Zhengying Li (Wuhan University of Technology)

Tolerance Assignment and Optimization of Space Deployable Supporting Structure 111
Yan Su (Beijing University of Aeronautics and Astronautics), Wang Chunjie (Beijing University of Aeronautics and Astronautics), Zhao Ruijie (Beijing University of Aeronautics and Astronautics), and Li Lin (China Academy of Space Technology)

Session 2: Factory Automation

A Common Model for Railway Train Timetable Optimization 115
Li Zhi (China Academy of Railway Sciences Co. Ltd)

A Research on IoT Based Smart Home 120
Linlian Ma (Guizhou Institute of Technology), Zhangbing Li (Hunan University of Science and Technology), and Mingcai Zheng (Hunan First Normal University)

Aerial Driverless Electric Taxi System Program Research 123
Guo Wenlian (Tianjin Transportation Vocational College)

An Efficient Post-Tensioned Prestressed Concrete Bridge Construction Approach 128
Shilan Li (Liao Ning Jian Zhu Vocational College)

Analysis of Electromagnetic Characteristics of High Frequency Transformer Based on C Type Nanocrystalline Magnetic Core 132
Lei Chen (Shenyang University of Technology), Zhenqiang Zhang (Shenyang University of Technology), Xiangming Wang (Shenyang University of Technology), Qitong Fu (Shenyang University of Technology), and Zuoxia Xing (Shenyang University of Technology)

Application Research of Computer Information Technology in Intelligent Building Engineering Management 136
Li Shilan (Liao Ning Jian Zhu Vocational College)

Autonomic Self-Testing of Regression and Internationalization Based on Cloud Computing 141
Yajun Liu (Xi'an University of Technology), Aimin Li (Xi'an University of Technology), Sheng Liu (Xi'an University of Technology), Ailin Zhang (Xi'an University of Technology), and Yuan Ting (Xi'an University of Technology)

Construction of Team Cognition and Management Model Under Information Network Environment 145
Yue Chen (Zhejiang University School of management)

Coordination Scheduling Model for Minimum Energy Consumption of Cogeneration of Cool, Heat and Electricity 150
Zhang Tieyan (Shenyang University of Technology), Wang Cenjiao (Shenyang University of Technology), Hui Qian (State Grid Liaoning Electric Power Co.), Gao Xiying (State Grid Liaoning Electric Power Co.), Yu Xin (State Grid Liaoning Power Co., Ltd. Dandong Power Supply Company), and He Huan (State Grid Anshan Electric Power Supply Company)

Design and Implementation of Electronic Archives Information Management Under Cloud Computing Platform 154
Ying Wang (Shandong University Of Arts)

Design Research on Automatic Unpacking Equipment for Bullet Packing Box 159
Zhang Huaizhi (Army Engineering University of PLA), Ji Wensu (Army Engineering University of PLA), and Yu Zhizhong (3606 Factory)

Dynamic Analysis of the Modular Parabolic Deployable Mechanism 163
Hu Junjie (Beijing University of Aeronautics and Astronautics), Wang Chunjie (Beijing University of Aeronautics and Astronautics), and Ding Zongmao (Beijing University of Aeronautics and Astronautics)

Evaluation Index System of Source-Network-Load-Storage Coordination for Integrated Energy System 167
Wei Hu (State Grid Jiangsu Electric Power Co., Ltd.), Xiao Lu (State Grid Jiangsu Electric Power Co., Ltd.), Shuo Liang (China Electric Power Research Institute Co., Ltd.), Xiaohui Xu (China Electric Power Research Institute Co., Ltd.), and Xuedong Jiang (Zhejiang University)

Identity Authentication with Signature Verification 173
Yongjian Zhao (Shandong University)

Performance Analysis of On-line Cleaning Machine for Rail Transit Vehicle Skin 178
Tang Youming (Xiamen University of Technology), Zhang Jun (Xiamen University of Technology), Lei Ming (Xiamen University of Technology), Zha Xinyu (Xiamen University of Technology), and Ou-Yang Liange (Xiamen University of Technology)

Railway Vehicle Fault Intelligent Maintenance System Based on Association Mining 182
Wang Jinhua (Wuhan Railway Vocational College of Technology)

Research on Prediction Method of Power System Transient Disturbed Trajectory Based on Self-Remembering Model 187
Yu Xin (Liaoning Electric Power Co., Ltd. Dandong Power Supply Company), Zhao Yi (Liaoning Electric Power Co., Ltd. Dandong Power Supply Company), Yu Xiaochen (Liaoning Electric Power Co., Ltd. Dandong Power Supply Company), Zhou Runxing (Guangdong Power Grid Co., Ltd. Zhuhai Power Supply Bureau), Luo Xiaochu (Liaoning Electric Power Co., Ltd. Dandong Power Supply Company), Ma Yixuan (Nanyang Technological University), and Gao Zhongfan (Liaoning Electric Power Co., Ltd. Dandong Power Supply Company)

Research on the Management System of Personal Income Tax and Wage Based on Merit Pays 191
Li Zhu (Jiangxi Science and Technology Normal University), Lan Bai (Jiangxi Science and Technology Normal University), Wei Wang (Jiangxi Science and Technology Normal University), Weihua Zhang (Jiangxi Science and Technology Normal University), and Qi Xiong (Jiangxi Science and Technology Normal University)

Research Summary on Frequency Modulation Characteristics of Sender Grid in Large New Energy Base 195
Yongfei Ma (State Grid Qinghai Electrical Power Company), Jun Yang (State Grid Qinghai Electrical Power Company), Shipeng Liu (State Grid Qinghai Electrical Power Company), Huabiao Wang (Chongqing Electric Power College), Canghai Wang (Sichuan Guang'an Power Generation Co., Ltd.), and Xianmin Wang (State Grid Qinghai Electrical Power Maintenance Company)

Simulation Analysis of Compressor Flow Field in Vehicle Turbocharger 199
Rujing Lei (Wuhan Business University)

Simulation Research on Network Intrusion Prevention and Fluctuation Control System Based on Cloud Computing Architecture 204
Ming Wei (Peking University) and Hui Yuan (Peking University)

Strength Analysis of the Box of On-Line Cleaning Machine for Rail Transit Vehicle Shell 208
Tang Youming (Xiamen University of Technology), Lv Changming (Xiamen University of Technology), Lv Na (Southeast (Fujian) Automotive Industry Co., Ltd), Zha Xinyu (Xiamen University of Technology), and Ou-Yang Liange (Xiamen University of Technology)

Study on Frequency Characteristic and Frequency Modulation Parameter Optimization of High Proportion of New Energy in Power Grid 212
Yongfei Ma (State Grid Qinghai Electrical Power Company), Jun Yang (State Grid Qinghai Electrical Power Company), Huabiao Wang (Chongqing Electric Power College), Shipeng Liu (State Grid Qinghai Electrical Power Company), Canghai Wang (Sichuan Guang'an Power Generation Co., Ltd.), and Xianmin Wang (State Grid Qinghai Electrical Power Maintenance Company)

The Application of Intelligent and Modular Development of Mechatronics: A Case of Design of Smart Home System 216
Song Zhen (College of Art and Design of Dalian Polytechnic University) and Shen Shilin (College of Art and Design of Dalian Polytechnic University)

The Hydrodynamic Experiment of Rotor of Marine Current Turbine with Self-Pitch and Variable Flap 220
Xiao Zhang (Changchun Institute of Technology), Zhonghai Luo (Changchun Institute of Technology), Dawei Fu (Changchun Institute of Technology), and Wangqiang Zhu (Northeast Normal University)

Session 3: Sensor and Measuring Technology

A Fatigue Driving Detection Method Based on Multi Facial Features Fusion 225
Fang Bin (Hunan Police Academy), Xu Shuo (Hunan Police Academy), and Feng Xiaofeng (Hunan Police Academy)

A Novel Non-intrusive Load Monitoring Method Based on Quantum Particle Swarm Optimization Algorithm . 230
Guofeng Ding (State Grid Ningbo Electric Power Company), Chenghuan Wu (State Grid Ningbo Electric Power Company), Yang Wang (State Grid Ningbo Electric Power Company), Yujie Liang (State Grid Ningbo Electric Power Company), Xuedong Jiang (Zhejiang University), and Xiaobo Li (Zhejiang University)

A Practical Network Malicious Behavior Monitoring System 235
Hongyu Zhu (State Grid Hunan Electric Power Corporation Research Institute), Jianwei Tian (State Grid Hunan Electric Power Corporation Research Institute), Zheng Tian (State Grid Hunan Electric Power Corporation Research Institute), Hong Qiao (State Grid Hunan Electric Power Corporation Research Institute), Xi Li (State Grid Hunan Electric Power Corporation Research Institute), and Shu Li (State Grid Hunan Electric Power Corporation Research Institute)

An Intrusion Detection Scheme Combining FCM and Kohonen Network 239
Chen Ming-Xia (Department of Guilin University of Technology), Zhang Han (Department of Guilin University of Technology), and Li Shun-Yan (Department of Guilin University of Technology)

Analysis of Driver Workload on Different Types of Optical Tunnels 244
Jie Luo (Chongqing Vocational College of Transportation), Siqing Xiong (Chongqing Vocational College of Transportation), and Jin Hong (Chongqing Vocational College of Transportation)

Big Data Analysis Based on Fault Detection Modeling of Microgrid Information Flow 248
Zhao Yi (Liaoning Electric Power Co., Ltd. Dandong Power Supply Company), Ma Yixuan (Nanyang Technological University), Gao Zhongfan (Liaoning Electric Power Co., Ltd. Dandong Power Supply Company), Yu Xin (Liaoning Electric Power Co., Ltd. Dandong Power Supply Company), Zhou Runxing (Guangdong Power Grid Co., Ltd. Zhuhai Power Supply Bureau), Yu Xiaochen (Liaoning Electric Power Co., Ltd. Dandong Power Supply Company), and Luo Xiaochu (Liaoning Electric Power Co., Ltd. Dandong Power Supply Company)

Comparison Analysis on Three Typical Small Overlap Collision Tests 252
Zhixin Liu (China Automotive Technology and Reasearch Center Co., Ltd), Weijie Ma (China Automotive Technology and Reasearch Center Co., Ltd), and Yongqiang Wu (China Automotive Technology and Reasearch Center Co., Ltd)

Demodulation Method of Identical Ultra-Weak Fiber Bragg Grating Array Based on Golay Code 256
Wei Yang (Wuhan University of Technology), Xuelei Fu (Wuhan University of Technology), Jiaqi Wang (Wuhan University of Technology), Yue Yang (Wuhan University of Technology), Jingyu Xu (Wuhan University of Technology), and Zhengying Li (Wuhan University of Technology)

DVC Decoding Algorithm Based on Wireless Transmission 261
Hancheng Yang (Guangxi University) and Jijun Yang (Guangxi University of Finance and Economics)

Fault Diagnosis of Nautical Instrument Circuit Board Based on Neural Network 266
Li Weibo (Naval Aviation University), Qi Xuewen (Naval Aviation University), and Yang Dawei (Naval Aviation University)

High Speed Demodulation System of FBG-EFPI Hybrid Sensor Based on Fourier Domain Mode-Locked Laser 269
Peng Shen (Wuhan University of Technology), Xiao Liang (Wuhan University of Technology), Yiming Wang (Wuhan University of Technology), Honghai Wang (Wuhan University of Technology), Yarong Hou (Wuhan University of Technology), and Zhengyin Li (Wuhan University of Technology)

Image Fuzzy Edge Detection Algorithm Based on the Consideration of Multi-sensor Information Fusion 274
Lili Cai (Communication University of Nanjing)

Non-Intrusive Load Monitoring Method Based on Improved Differential Evolution Algorithm 279
Chunguang Lu (State Grid Zhejiang Electric Power Research Institute), Lvbin Ma (Zhejiang Huayun Information Technology Co., Ltd.), Tao Xu (State Grid Zhejiang Electric Power Research Institute), Guofeng Ding (State Grid Ningbo Electric Power Company), Chenghuan Wu (State Grid Ningbo Electric Power Company), and Xuedong Jiang (Zhejiang University)

Optical Fiber Extrinsic Fabry-Perot Interferometric Sensor for Large-Strain Measurement 284
Chuanguang Liu (Wuhan University of Technology), Honghai Wang (Wuhan University of Technology), De Li (Wuhan University of Technology), and Zhengying Li (Wuhan University of Technology)

Research on a General Fast Analysis Algorithm Model for PD Acoustic Detection System: Pattern Identification with Phase Compensation 289
Wen-Rong Si (State Grid Shanghai Electric Power Research Institute), Xing-De Huang (State Grid Shanghai Electric Power Research Institute), Zi Xin (State Grid Shanghai Electric Power Research Institute), Bing-Bing Lu (State Grid Shanghai Electric Power Research Institute), Hai-Long Bao (State Grid Shanghai Electric Power Research Institute), Peng Xu (State Grid Shanghai Electric Power Research Institute), and Jun-Hao Li (Xi'an Jiaotong University)

Research on Diagnosis and Treatment Methods of Common Malfunction in Electronic Circuits 294
Heqiong Zeng (Wuhan Technology and Business University) and Jun Hu (Hubei Vocational College of Bio-Technology)

Research on FAGP Alarm System Based on Multi-Temperature Sensor 298
Jing Zhao (WuHan HuaXia University of Technology)

Research on Indoor Edge Location Based on Location Fingerprint Recognition 303
Bai Wenxuan (Lanzhou Jiaotong University), Feng Zhihong (Lanzhou Jiaotong University), Pang Min (Lanzhou Jiaotong University), and Wang Pu (Lanzhou Jiaotong University)

Research on Quality Analysis Method of Building Synthetic Resin Materials Based on Cloud Computing 308
Zhao Yuhan (Liaoning Construction Vocational College)

Research on Simulation of Naval Battlefield Intelligence Detection Under Complicated Electromagnetic Environment 315
Qi Xuewen (Naval Aviation University), Li Weibo (Naval Aviation University), and Yang Dawei (Naval Aviation University)

Structural Stress Analysis and Strength Evaluation of Drying Tower in Liquefaction Station 319
Wu Ling (Daqing Petrochemical Engineering Co. Ltd)

Session 4: Intelligent Control

A Combined Control Method of Temperature and Humidity Inside the Museum Cabinet 323
Xia Shuang (Hefei University of Technology), Zhang Dongyang (Hefei University of Technology), Liu Zhen (Hefei University of Technology), and Zhang Hui (Hefei University of Technology)

An Improved of Information Transmission Mode of High-Speed Railway Centralized Traffic Control System 328
Chen Feng (China Academy of Railway Sciences Corporation Limited)

Big Data Logistics Inventory Control Model Based on Error Correction Model 333
Canhui Pan (Kunming Metallurgy College)

Control Strategy of Active Load Participating in Distributed Photovoltaic Generation in Microgrid Operation 338
Zhang Tieyan (Ministry of Education (Shenyang University of Technology)), Xu Longbiao (Ministry of Education (Shenyang University of Technology)), Hui Qian (Customer Service Center), Cai Yingkai (Customer Service Center), Yao Zheng (Dandong Power Supply Company), and He Huan (State Grid Anshan Electric Power Supply Company)

Deformation Monitoring and Control of Geotechnical Engineering Based on Intelligent Optimal Algorithms 342
Shiguang Feng (No2 Geological Brigade of Hebei Geology and Mineral Exploration Bureau) and Jianbing Liu (No2 Geological Brigade of Hebei Geology and Mineral Exploration Bureau)

Design And Simulation of Naval Gun Servo Controller Based on ADRC 346
Shen Zhonghua (The 713 Research Institute of CSIC)

Design of the Perform Robot 351
Min Peng (Wuhan Technology and Business University), Zhi Xin Peng (Wuhan Technology and Business University), and Zhi Min Chen (Naval University of Engineering)

Distributed Power Supply Coordinated Economic Operation Strategy Based On Electrohydrogen Coupled Energy Storage 356
Zhang Tieyan (Ministry of Education (Shenyang University of Technology)), Zhao Yang (Ministry of Education (Shenyang University of Technology)), Hui Qian (State Grid Liaoning Electric Power Co.), Wang Yizhe (State Grid Liaoning Electric Power Co.), Zhang Fang (State Grid Liaoning Power Co., Ltd. Dandong Power Supply Company), and He Huan (State Grid Anshan Electric Power Supply Company)

Impact Analysis of Vibration Isolation Parameter to Axial Displacement of Propulsion Motor 359
Shen Du (China Ship Development and Design Center)

Multi-objective Optimization of Handling Stability of the Centre Axle Trailer Train 364
Chao-Zhi Huang (China Automotive Engineering Research Institute), Fen-Tian Cai (Ministry of Transport), Jun Long (China Automotive Engineering Research Institute), Hong-Gang Wang (China Automotive Engineering Research Institute), and Hua Fang (China Dingyuan Automotive Proving Ground)

Overview of Semantic Information Applications for Robots 371
Peng Liu (Qiqihar University), Xuefeng Dai (Qiqihar University), Dahui Li (Qiqihar University), and Ming Sun (Qiqihar University)

Research and Application of Key Technologies for EHV Intelligent Series Compensation Control and Protection System 376
Li Zheng (State Grid Jibei Electric Power Co. Ltd. Tangshan Power Supply Company), Fan Xiao-Wei (State Grid Jibei Electricity Power Maintenance Company), Li Zhen-Dong (State Grid Jibei Electricity Power Maintenance Company), An Hai-Qing (State Grid Jibei Electricity Power Maintenance Company), Liu Yi-Chen (State Grid Jibei Electricity Power Maintenance Company), Liu Jie (State Grid Jibei Electricity Power Maintenance Company), and Zhou Zi-Wei (State Grid Jibei Electricity Power Maintenance Company)

Research on Technology of Fluid-Impact Fatigue Fracture Deburring Based on Industrial Robot 382
Haiyan Hu (Jilin Business and Technology College), Chang Su (Changchun Eleventh High School), and Jinming Zhou (Jilin Business and Technology College)

Session 5: Intelligent Computation and Engineering Application

3D Face Reconstruction with Texture Details from a Single Image Based on GAN 386
Hailan Kuang (Wuhan University of Technology), Yiran Ding (Wuhan University of Technology), Xiaolin Ma (Wuhan University of Technology), and Xinhua Liu (Wuhan University of Technology)

A Human Action Recognition Model Inspired by Multiple Scale Temporal Segments Model Fusion 390
Hailan Kuang (Wuhan University of Technology), Wentao Liu (Wuhan University of Technology), Xinhua Liu (Wuhan University of Technology), and Xiaolin Ma (Wuhan University of Technology)

A Novel Algorithmic Trading Approach Based on Reinforcement Learning 395
Li Xucheng (Dalian Neusoft University of Information) and Peng Zhihao (Dalian Neusoft University of Information)

A Research on Identification and Predication of Sows' Oestrus Behavior Based on Hopfield Neural Network 400
Wu Daqin (Jilin Business and Technology College) and Hu Haiyan (Jilin Business and Technology College)

A Secure and Size Efficient Approach to Enhance the Performance of Text Steganographic Algorithm 403
Muhammad Azeem (Beijing University of Technology), Cai Yongquan (Beijing University of Technology), Khurram Gulzar Rana (Beijing University of Technology), Zeeshan Shaukat (Beijing University of Technology), and Allah Ditta (Beijing University of Technology)

A Traffic Sign Image Recognition and Classification Approach Based on Convolutional Neural Network 409
Liu Shangzheng (Nanyang Institute of Technology)

Analysis of Problems and Solutions in Integrated Management of Operating Room Supply Room 413
Li Linlin (Operating Center of China-Japan Union Hospital of Jilin University), Zhang Yanqiu (Operating Center of China-Japan Union Hospital of Jilin University), Zhao Feng (Operating Center of China-Japan Union Hospital of Jilin University), and Su Zhen Bo (China-Japan Union Hospital of Jilin University)

Analysis of Urban Talent Demand Model Based on Neural Network 417
Tong Bairui (Shenyang Aerospace University), Chen Cheng (Shenyang Aerospace University), Li Lubo (Shenyang Aerospace University), and Wen Lishu (Shenyang Aerospace University)

Application of a Deep Reinforcement Learning Method in Financial Market Trading 422
Lixin Ma (Dalian Neusoft University of Information) and Yang Liu (Dalian Neusoft University of Information)

Collaborative Research on Digital Business Processes of Supply Chains in Real Estate 427
Xu Xiangjin (Kunming University of Science and Technology Oxbridge College) and Zhang Yao (Kunming Changshui International Airport)

Comparison of the Different Sampling Techniques for Imbalanced Classification Problems in Machine Learning 432
Peng Zhihao (Dalian Neusoft University of Information), Yan Fenglong (Dalian Neusoft University of Information), and Li Xucheng (Dalian Neusoft University of Information)

Double Peaks Detection for Object Tracking 436
Kewen Liu (Wuhan University of Technology), Dongcheng Lu (Wuhan University of Technology), and Hongxia Xiong (Wuhan University of Technology)

Effect of Glycoproteins Extracted from Perna Viridis (GPP) on Immunologic Function in Immunosuppressive Mice 441
Shuji Liu (Fujian Agriculture and Forestry University), Zhiyu Liu (Fujian Collaborative Innovation Center for Exploitation and Utilization of Marine Biological Resources), and Jinquan Chen (Fujian Agriculture and Forestry University)

Image Retrieval Based on LDA and SVM 447
Chunjun Zheng (Dalian Neusoft University of Information) and Yi Zhang (Dalian Shipping College)

Improved Particle Swarm Optimization Image Registration Based on Mutual Information 451
Yang Yonghong (Lanzhou JiaotongUniversity), Li Jiying (Lanzhou JiaotongUniversity), Wen Qiang (Lanzhou JiaotongUniversity), and Zhou Tao (Lanzhou JiaotongUniversity)

Integrated Load Forecasting Model of Multi-Energy System Based on Markov Chain Improved Neural Network 456
Zhang Tieyan (Shenyang University of Technology), Li Hening (Shenyang University of Technology), Hui Qian (State Grid Liaoning Electric Power Co.), Kong Xuan (State Grid Liaoning Electric Power Co.), Gao Shengyu (State Grid Liaoning Electric Power Co.), Yu Xiaochen (State Grid Liaoning Power Co., Ltd. Dandong Power Supply Company), and He Huan (State Grid Liaoning Power Co., Ltd. Dandong Power Supply Company)

Interactive Teaching Path Analysis of Higher Vocational Ideological and Political Courses Based on Artificial Intelligence Algorithms 460
Zhang Yunfang (Shandong Institute of Commerce and Technology) and Wang Yuexi (Shandong Institute of Commerce and Technology)

Location Sensitive Regression Algorithm for Multi-oriented Scene Text Detection with Focal Loss 464
Hailan Kuang (Wuhan University of Technology), Zheng Li (Wuhan University of Technology), Xiaolin Ma (Wuhan University of Technology), and Xinhua Liu (Wuhan University of Technology)

Research on App Usage Behavior Analysis and Prediction Algorithms for Mobile Users 469
Aihua Wang (Shandong Institute Of Commerce And Technology)

Research on Heterogeneous Terminal Security Access Technology in Edge Computing Scenario 474
Lu Chen (Global Energy Interconnection Research Institute), Zhoubin Liu (State Grid Zhejiang Electric Power Research institute), and Zixiang Wang (State Grid Zhejiang Electric Power Research institute)

Research On Power System Load Forecasting Model Based On Machine Learning 479
Bo Peng (Sichuan University), Chunyang Wang (Chengdu University of information technology), and Xudong Tang (Chengdu University of information technology)

Resource Optimization Scheduling Method for Smart Grid 483
Yonglei Cao (Beijing Bluesky Environmental Science & Technology Co., Ltd.)

Target Tracking Algorithm for Specific Person Based on Multi-loss of Siamese Network 487
Xinhua Liu (Wuhan University of Technology), Yunya Zhong (Wuhan University of Technology), Xiaolin Ma (Wuhan University of Technology), and Hailan Kuang (Wuhan University of Technology)

The Research of BP Neural Network Based on Ant Colony Algorithm in Port Throughput Prediction 492
Zhi Nie (Central South University) and Yufei Zhao (Central South University)

The Research of LTE-R Handoff Algorithm Based on Fuzzy Prediction 495
Wen Qiang (Lanzhou Jiaotong university), Li Jiying (Lanzhou Jiaotong university), Yang Yonghong (Lanzhou Jiaotong university), and Li Ya (Lanzhou Jiaotong university)

Three-Dimensional Localization Algorithm for WSN Nodes Based on RSSI-TOA and LSSVR Method 500
Lieping Zhang (Guilin University of Technology), Zhengzhong Wang (Guilin University of Technology), Zhenwu Kuang (Guilin University of Technology), and Huanhuan Yang (Guilin University of Technology)

Traffic Prediction and Attack Detection Approach Based on PSO Optimized Elman Neural Network 506
Wei Guoli (Inner Mongolia University for Nationalities)

Session 6: Information Security and Big Data

A Chinese-English Translation Model for Mobile Terminal System Based on Neural Network 511
Wu Ying (Liaoning Jianzhu Vocational College)

A Kind of Basketball Teaching System Design Based on Network 515
Zhiling Chen (University of South China)

A Teaching System of English Online Course Based on Artificial Intelligence 519
Liu Jing (Jingzhou Vocational College Of Technology)

An Efficient Semantic Retrieval Method for Network Education Information Resources 524
Hai Jiang (Hulun Buir University)

Analysis of Administrative Management and Decision-Making Based on Data Warehouse 529
Xu Peng (Harbin Normal University)

Analysis on the Influence of Core Nodes of Visual Communication Symbols in Cross Cultural Advertising Network Communication 533
Xiaorong Yuan (Guangxi Arts University)

Development and Implementation of Internet Marketing System Service Architecture Based on Big Data 539
Gao Yuan (Wuhan Polytechnic)

Figure Image Recognition and Classification Algorithm Based on Biological Vision Perception 544
Liu Shangzheng (Nanyang Institute of Technology)

High-Tech Enterprises' Performance Evaluation System Construction and EVA Analysis 549
Shen Chang-Fu (Hohai University)

Multi-expression Generative Adversarial Networks for Facial Expression Synthesis 553
Hailan Kuang (Wuhan University of Technology), Zhuo Chen (Wuhan University of Technology), Xiaolin Ma (Wuhan University of Technology), and Xinhua Liu (Wuhan University of Technology)

Omni-Directional Time Evolution Analysis Based on Multidimensional Financial Big Data 558
Shuhua Wang (Hulunbuir University)

Research on Application of Information System to Nursing Management 563
Hengyu Cai (China-Japan Union Hospital of Jilin University), Guijie Li (China-Japan Union Hospital of Jilin University), Hang Zhao (China-Japan Union Hospital of Jilin University), and Yutao Liu (China-Japan Union Hospital of Jilin University)

Research on Financial Risk Prediction and Prevention Countermeasures Based on Big Data 566
Yuzhi Li (College of Humanities & Information Changchun University of Technology)

Research on Information Security Situation Awareness System Based on Big Data and Artificial Intelligence Technology 570
Zhu Hongqin (East China University of Technology)

Research on Intelligent Evaluation Method of Building Construction Quality Based on Big Data Under the Influence of Multiple Factors 576
Yang Yong (Liaoning Construction Vocational College)

Research on Intelligent Marketing Management System Based on Ontology 583
Li Ruixin (Dalian Neusoft University of Information) and Lu Xiaoxue (Dalian Neusoft University of Information)

Research on Solutions to Privacy Security Problems Based on Big Data 587
Liu Hongling (Guangzhou Nanyang Polytechnic College)

Research on the Construction of E-commerce Security Risk Assessment Model Based on Cloud Computing ... 591
Yan Li (Jiangxi Science and Technology Normal University), Hong Zhao (Jiangxi Science and Technology Normal University), and Li Zhu (Jiangxi Science and Technology Normal University)

Research on the Fusion of Financial Aid Indicators Determination of Needy Students Based on Big Data..... 595
Ruiying Zheng (Jiangxi Science and Technology Normal University), Weihua Zhang (Jiangxi Science and Technology Normal University), Li Zhu (Jiangxi Science and Technology Normal University), Xing Liu (Jiangxi Science and Technology Normal University), and Jianming Xiao (Jiangxi Science and Technology Normal University)

The Establishment of University Teachers' Knowledge Connotation Reconstruction Model Based on Big Data 599
Peizhen Wan (Jiangxi Science and Technology Normal University), Li Zhu (Jiangxi Science and Technology Normal University), Jianlan Liu (Jiangxi Science and Technology Normal University), and Yundi Yu (Jiangxi Science and Technology Normal University)

The Sharing Charging System Cloud Based on Bomb Back-end Cloud 604
Peng Zijian (Wuhan University of Technology), Hu Qunqiang (Wuhan University of Technology), Zhu Zhenyu (Wuhan University of Technology), and Li Zhengying (Wuhan University of Technology)

Training Method for Amateur Sports in Schools Dependent on Time Series Data 608
Nan Wan (Jiangxi Science and Technology Normal University) and Lu Wan (Yuzhang Normal University)

Session 7: Web Application

An Acoustic Model for English Speech Recognition Based on Deep Learning 612
Zhang Ling (Chifeng University)

An Information Visualization Method for Computer Teaching 617
Hai Jiang (Hulun Buir University)

Application of the K Nearest Neighbor Algorithm Based on Scaling Weight in Intelligent Attendance System 621
Jianmei Sun (Dalian University of Science and Technology), Yu Bo (Dalian University of Science and Technology), Jiawei Luo (Dalian University of Science and Technology), and Junshan Yang (Dalian University of Science and Technology)

Construction of Financial Management Information System Model in Colleges and Universities Based on Data Mining Algorithm 625
Xinyuan Wang (Hulunbuir University)

Design and Implementation of Virtual Education Laboratory 630
Bai Yan (NingxiaNormal University) and Zhang Fangqin (NingxiaNormal University)

Development and Application of Integrated English Online Teaching System Based on Web 635
Ou Guofang (Chongqing Business Vocational College)

Development of a Spacecraft Separation Simulation and Analysis Software 640
Fan Jie (Beihang University of Aeronautics and Astronautics), Wang Chunjie (Beihang University of Aeronautics and Astronautics), and Deng Haoyu (Beihang University of Aeronautics and Astronautics)

Elimination of Machine Translation Errors in English Language Transformation 644
Panpan Du (Yinxing Hospitality Management College of CUIT)

English Pronunciation Recognition and Detection Based on HMM-DNN 650
Wu Ying (Liaoning Jianzhu Vocational College)

Image Guidance of Skill Representation of Aerobics Athletes Based on the Consideration of Rhythm Feature Matching Model 655
Jianmei Liao (Xiamen University of Technology)

Intelligent Forecasting Model for Hydrological and Water Resources System 659
Jianbing Liu (No2 Geological Brigade of Hebei Geology and Mineral Exploration Bureau) and Shiguang Feng (No2 Geological Brigade of Hebei Geology and Mineral Exploration Bureau)

Quantitative Evaluation Model for Load Intensity of High Level Sprinters in Colleges and Universities Based on the Consideration of Human Energy Supply System Theory 664
Leipo Chen (Guangzhou University)

Optimal Allocation of Human Resources Based on Intelligent Computer Management System 669
Sufen Jiang (Shandong Women's University)

Research on a General Fast Analysis Algorithm Model for Pd Acoustic Detection System: The Software Development 673
Xing-De Huang (State Grid Shanghai Electric Power Research Institute), Chen-Zhao Fu (State Grid Shanghai Electric Power Research Institute), Lei Su (State Grid Shanghai Electric Power Research Institute), Dan-Dan Zhao (State Grid Shanghai Electric Power Research Institute), Rong Xiao (State Grid Shanghai Electric Power Research Institute), Qi-Yu Lu (State Grid Shanghai Municipal Electric Power Company), and Wen-Rong Si (State Grid Shanghai Electric Power Research Institute)

Research on Application of Informatization Management in Nursing Teaching 678
Yutao Liu (China-Japan Union Hospital of Jilin University), Hengyu Cai (China-Japan Union Hospital of Jilin University), Hang Zhao (China-Japan Union Hospital of Jilin University), and Guijie Li (China-Japan Union Hospital of Jilin University)

Research on Computer Network Simulation Platform Based on VR Technology 681
Jianlan Liu (Jiangxi Science and Technology Normal University), Zhen Xu (Jiangxi Science and Technology Normal University), Weihua Zhang (Jiangxi Science and Technology Normal University), Yibo Wang (Jiangxi Science and Technology Normal University), and Jing Rao (Jiangxi Science and Technology Normal University)

Research on Feature-Based Word Automatic Translation Technology in Japanese-Chinese Translation System 685
Jing Liu (Shandong Women`s University)

Research on OMR Recognition Based on Convolutional Neural Network Tensorflow Platform 690
Yunxia Ju (Shandong Normal University), Xichang Wang (Shandong Education Admissions Examination Institute), and Xiangxi Chen (Chinese Academy of Information and Communication)

Research on the Application of Internet - Oriented OA Office System in Petroleum Enterprises 694
Yanli Huo (Oil Preproduction Technology Institute of Dagang Oilfield)

Research on the Medical System Design of Community Old-Age Care in Intelligent City 699
Wang Nan (Dalian Polytechnic University)

Research on the Teaching Model of Oral English Training Based on Digital Network 703
Yang Jun (Liaoning Jianzhu Vocational College)

Researchon Application of Network System to Nursing Management 707
Guijie Li (China-Japan Union Hospital of Jilin University), Yutao Liu (China-Japan Union Hospital of Jilin University), Hang Zhao (China-Japan Union Hospital of Jilin University), and Hengyu Cai (China-Japan Union Hospital of Jilin University)

Shopping Website Search System Based on Solr 710
Dong Yi (Wuhan University of Technology) and Wu Youyu (Wuhan University of Technology)

The Applied Research of Virtual Teaching Based on VR Technology 714
Wang Chenyang (Nanjing Normal University), Wang Xiaoling (Nanjing Normal University), and Ma Hongbo (Nanjing Normal University)

Volleyball Footwork Movement Teaching Mode Based on the Fusion of Frontal Double Handed Overhead Pass Technical Action Model 719
Xiaomei Huang (Xiamen University of Technology)

Session 8: Model, Optimization, and Simulation

A Music Retrieval Approach Based on Hidden Markov Model 723
Guo Qian (Lanzhou City University College of Music)

A New Object Detection Method Based on T Mutation PSO for SVM Parameter Optimization 728
Zhang Yang (Fujian University of Technology), Yang Shumin (Fujian University of Technology), Wu Shaoxiong (Fujian University of Technology), and Xin Dongrong (Fujian University of Technology)

An Acoustic Recognition Model for English Speech Based on Improved HMM Algorithm 731
Wu Ting (Wuhan Huaxia University of Technology)

An Optimization Model for Human-Object Interaction Detection Inspired by Multi-features 735
Hailan Kuang (Wuhan University of Technology), Jian Dong (Wuhan University of Technology), Xinhua Liu (Wuhan University of Technology), and Xiaolin Ma (Wuhan University of Technology)

Design of Sports Tourism Consumption Risk Perception Scale Based on the Integration of the Improved Gaussian Mixture Model 740
Xiuping Chen (Xiamen University of Technology)

Development and Injury Analysis of a 3-Year-Old Child Abdominal Finite Element Model with Detailed Anatomy Structure 745
He Lijuan (Tianjin University of Science and Technology), Li Haiyan (Tianjin University of Science and Technology), Lu Ruirui (Dayun Motor CO ., LTD), and Cui Shihai (Tianjin University of Science and Technology)

Effect Evaluation of Real Estate Marketing Planning Course Teaching Reform System Based on Multidimensional Extension Matter Element Model 755
Zheng Huikai (Hunan City University School of Urban Management) and Mo Lianguang (Hunan City University School of Urban Management)

Empirical Analysis of Regional Balanced Development of Ethnic Elementary Education Dependent on Personalized Intelligent Adjustment Algorithm – A Case Study of Hulunbuir Region 762
Yanyan Ma (Hulunbuir University)

Feedback Analysis of Thinking Model in Mathematical Problem Solving Combining Multi-objective Optimization Model 768
Minghong Jiang (Hulunbuir University)

Model Updating and Analysis of Cable-Strut Deployable Articulated Mast 773
Dong Yang (Beihang University), Liu Dong (China Academy of Space Technology), Fan Junfeng (China Academy of Space Technology), Ding Feng (China Academy of Space Technology), Wang Chunjie (Beihang University), and Ding Zongmao (Beihang University)

Modeling and Analysis of Influencing Factors on Diversification of Online Tourism Services from the Perspective of Internet 777
Jun Feng (Torism College of Zhejiang)

On Quality Evaluation System and Methods of Pre-School Education in Engineering Colleges 783
Qi Haiyan (Bengbu University) and Chen Huaxi (Bengbu University)

Optimization of Grid Dynamic Resource Scheduling Algorithm Based on Response Time 788
Guo Wei-Wei (Heilongjiang University of Technology), Liu Feng (Heilongjiang University of Technology), and Wang Hui (Heilongjiang University of Technology)

Physical Appearance Model of College Elite Male Aerobics Athletes Considering the Extraction of Physical Appearance Features 792
Juan Dai (Southwest Minzu University)

Physical Modeling of Production Potential for Expandable Screen Well Compilation 797
Yong Wang (Harbin Institute of Petroleum), Boyu Sun (Harbin Institute of Petroleum), and Dasheng Qi (Harbin Institute of Petroleum)

Portfolio Optimization Under the Framework of Reinforcement Learning 801
Li Xucheng (Dalian Neusoft University of Information) and Peng Zhihao (Dalian Neusoft University of Information)

Research on Coding Compression and Image Segmentation of Graphic Images 805
Yufei Zhao (Central South University), Hang Zhang (Central South University), and Zhi Nie (Central South University)

Research on Forecast Model and Algorithm of Train Passenger Sending Volume 809
Xia Fuquan (Bengbu University) and Zhang Yi (Bengbu University)

Research on Optimization of Resource Management and Task Scheduling Algorithm in Grid Computing 814
Liu Feng (Heilongjiang University of Technology), Guo Wei-Wei (Heilongjiang University of Technology), and Liu Lan-Bo (Heilongjiang University of Technology)

Research on Teaching Model of Oral English Training Based on Streaming Media Technology 818
Yang Fan (Wuhan Huaxia University of Technology)

Research on the Modeling of Campus Network Ideological Feature-Take the Case of Jiangxi Province 823
Wei Wang (Jiangxi Science and Technology Normal University), Li Zhu (Jiangxi Science and Technology Normal University), Weihua Zhang (Jiangxi Science and Technology Normal University), Ruiying Zheng (Jiangxi Science and Technology Normal University), and Jianlan Liu (Jiangxi Science and Technology Normal University)

Sports Video Motion Target Detection and Tracking Based on Hidden Markov Model 827
Li Zhou (Jiangxi Science and Technology Normal University)

Weibo Recommendation Algorithm Based on Tag Clustering and User Preference 832
Huiming Che (Shandong Normal University) and Liancheng Xu (Shandong Normal University)

Author Index **837**