2023 International Conference on Electronics and Devices, **Computational Science (ICEDCS 2023)**

Marseille, France 22 – 24 September 2023



IEEE Catalog Number: CFP23DE1-POD ISBN:

979-8-3503-1660-5

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

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

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

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

 IEEE Catalog Number:
 CFP23DE1-POD

 ISBN (Print-On-Demand):
 979-8-3503-1660-5

 ISBN (Online):
 979-8-3503-4303-8

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



2023 International Conference on Electronics and Devices, Computational Science (ICEDCS) ICEDCS 2023

Table of Contents

Message from the ICEDCS 2023 Technical Program Committee xxi Committees xxii
2023 International Conference on Electronics and Devices, Computational Science (ICEDCS)
Analysis of Wireless Communication System Based on Magnetic Field Coupling
Design of MISO Wireless Power Transfer System for Electric Vehicle in Optimal Efficiency
The Research of Cable External Rupture Prevention Device Based on MEMS Detectors

Lithium Battery Health State Assessment Based on Vehicle-to-Grid (V2G) Real-World Data and Categorical Boosting Model
An LPV-Hammerstein Model for Varying Coupling Coefficient Dynamic Modeling of WPT Systems 24 Yingheng Li (Chongqing University, China), Jing Xiao (Electric Power Research Institute of Guangxi Power Grid Co., Ltd, China), Xiaorui Wu (Electric Power Research Institute of Guangxi Power Grid Co., Ltd, China), Shaonan Chen (Electric Power Research Institute of Guangxi Power Grid Co., Ltd, China), Yuhong Mo (Electric Power Research Institute of Guangxi Power Grid Co., Ltd, China), and Ning Wu (Electric Power Research Institute of Guangxi Power Grid Co., Ltd, China)
Inversion Algorithm of Vertical Visibility Based on Laser Detection
Network Rumor Governance Scheme Based on Blockchain Technology
Quantification of Carbon Emission Technologies Based on Knowledge Graph Bert-BiLSTM-Attention-CRF Model
Building Electricity Consumption Analysis: Data-Driven Approach with Preprocessing, Visualization, and Cluster Analysis
Analysis of Phase-Shifting Constant Voltage Control of LCC-S Wireless Power Transfer System

Optimized Annual State Electricity Consumption Prediction Using GWO-GNN
Modeling and Prediction of Bee Population Based on Discretization, DGM (2,1) and Logistic Methods
Multi-Factor Investment Strategy Based on ChatGPT and Deep Learning Algorithm in new Energy Automobile Industry
Overview of Wireless Charging Positioning Guidance Technology for Electric Vehicles
Optimal Design and Simulation of Rectifier DC Copper Bus Support Based on Deflection Constraint
Deep Learning-Based Techniques for Influencing and Predicting the Impact of Public Figures' Social Media Statements on the Stock Market
3D Clothing Design Modeling Based on 3D Measurement and Generative Adversarial Networks 97 Jiayi Zhou (The Experimental High School Attached to Beijing Normal University, China)
Real-Time Multiplication Multiobjective Optimization Based on NSGA-II Algorithm
Research on Wireless Charging System of 11kw Electric Vehicle Based on Combined Magnetic Core

The Dynamic Evolution Mechanism of Carbon Emissions Based on Time-Lag Difference APSO-CKPLS
Qiyue Li (Hefei University of Technology, China), Zhiqi Fan (Hefei University of Technology, China), Linlin Gu (Hefei University of Technology, China), Yi Chen (Electric Power Scientific Research Institute of State Grid Anhui Electric Power Co, China), Qingjun Wang (Electric Power Scientific Research Institute of State Grid Anhui Electric Power Co, China), Long Zhao (Electric Power Scientific Research Institute of State Grid Anhui Electric Power Co, China), Binbin Li (Electric Power Scientific Research Institute of State Grid Anhui Electric Power Co, China), and Qi Qin (Electric Power Scientific Research Institute of State Grid Anhui Electric Power Co, China)
Automatic Control System for Thermal Power Plants Based on Artificial Intelligence
A Method for Monitoring the Operation Status of Wind Turbines Based on Cloud Services 127 Xiaoliang Zhang (Guodian Power Hebei New Energy Development Co., Ltd, China)
Online Monitoring Method for Bolts of Wind Turbine Generators
Commercial Aircraft 3-DoF Simulation Platform Design with Calculation
Analysis of Early Warning for Contact Status of Cable Joints in Switchgear Based on ANSYS 144 Zhisheng Lv (Xiamen University of Technology, China), Huikang Zhuang (Xiamen University of Technology, China), Weiying Chen (Xiamen University of Technology, China), and Yuchao Wang (Xiamen University of Technology, China)
Lasso Regression-Based Operational Risk Prediction for an Aircraft Type
Analysis of EEG Characteristics Under Binaural Auditory Beat Stimulation
Design and Simulation Analysis of Weeding Machine Chassis Based on CATIA and ADAMS 158 Jiao Peigang (Shandong Jiaotong University, China), Li Yinnan (Shandong Jiaotong University, China), and Liu Yang (Shandong Jiaotong University, China)

Assessment of Fatigue Level of Drivers of Different Ages Based on EEG Signals	163
Adaptive Fault-Tolerant Control for Half-Vehicle Suspension Under Actuator Failures and Dead Zones Yuting Fu (China Agricultural University, China), Xinyan Zhao (China Agricultural University, China), and Shumeng Li (Beijing Institute of Technology, China)	. 167
Multivariate Nonlinear Economic Forecasting Model Based on Immune Particle Swarm Optimization Neural Network Rongchang Liu (Logistics Management Office of Nanjing University of Chinese Medicine, China) and Guangli Yang (Xinhua College of Sun Yat-Sen University, China)	. 173
Research on the Construction Algorithm of Chinese Language Teaching System Based on Fuzzy Clustering	. 177
Research on Music Style Similarity Detection Algorithm Based on Relative Features	. 181
Application of Dynamic Segmentation and Weighted Comprehensive Matching in Music Style Recognition	. 186
Construction of Scientific and Technological Innovation Enterprise Management Information System Under Big Data Mining Technology	. 191
Simulation of Exterior wall Fire Control of High-Rise Building Based on PyroSim	. 196
Algorithm Analysis of Trade Gravity Model Based on PageRank Algorithm	. 201
Research on Digital Economy Monitoring and Evaluation System Based on Data Analysis Algorithm	205
Construction of Economic Benefit Evaluation Model of Industrial Enterprises Based on Economic Calculation Method	. 213
Construction of Risk Control Model of Financial Investment in Minor Enterprises Based on Decision Tree Algorithm Niu Xiaofang (Beijing Junyu International Import and Export Trading Co., Limited, China)	. 220
Research and Practice of Enterprise Education Mode in Universities Based on Data Mining	. 227
Intelligent Early Warning Algorithm of Local tax Credit Risk Based on Improved Support Vector Machine Chunling Ding (Beijing Institute of Economics and Management, China)	. 233

Financial Robot Task Assignment Algorithm Based on Improved Random Forest from the Perspective of Artificial Intelligence Yue Liu (Anhui Business and Technology College, China)	238
Construction of Enterprise Marketing Decisions Model Based on Decision Tree Algorithm	244
Genetic Algorithm Optimization of Concrete Frame Structure Based on Improved Random Forest. <i>Lihua Wei (Linyi University, China)</i>	249
Application of Internet of Things Optimization Engine Based on RETE Algorithm in English Interactive Teaching	254
3D Solid Mold Design and Model Quality Control Based on Machine Learning Algorithm <i>Juxian Wang (Anhui Vocational and Technical College, China)</i>	260
Application Research of SGD Algorithm Based on PCA Dimensionality Reduction Technique for Stock Price Prediction	265
Research on Engineering Project Schedule Optimization Method Based on HRRN	270
Research on Transformer Fault Diagnosis Method Based on Deep Learning Algorithm Optimization	276
Research on Chinese Entity Linking Based on Multi-Granularity Text Representation and Graph Neural Network	. 282
Research on Video Fusion Algorithm of Rail Transit Station Based on Two-Stream Network Peng Xu (The Third Research Institute of Ministry of Public Security, China)	287
Research on Image Database Classification Method Based on MHPA Weize Tang (Chang'an University, China), Lin Li (Chang'an University, China), Wencui Zhao (Chang'an University, China), and Rumi Yang (Chang'an University, China)	292
Research on Image Classification Algorithm Based on Convolutional Neural Network	299
A Real-Time Construction of Raster Maps Based on Improved Data Normalization	.304
Research on Localization and Mapping Algorithm of Industrial Inspection Robot Based on ORB-SLAM2	310
Research on UAV Cooperative Air Combat Route Planning Based on Multi-Objective Particle Swarm Optimization	316
Design of low-Order Controller for Time-Delay Systems Based on Dynamic Performance	322

A Structural and Semantic Evaluation Method for Social Media Datasets Based on PageRank	227
Algorithm with Cluster Analysis Xinwei Yuan (Beijing University of Posts and Telecommunications, China)	.321
Optimization of Low-Carbon Cold Chain Logistics Distribution Routes Based on Chaotic Genetic Algorithm	. 334
Yang Mailong (Shanghai Maritime University, China) and Chen Huaili (Shanghai Maritime University, China)	
The Effects of RF Power and Cavity Structure on the Plasma Discharge Characteristics of RPS	342
Hai Lin (Jinan University, China Electronic Product Reliability and Environmental Testing Research Institute, China), Wei Su (MOE Key Lab of Disaster Forecast and Control in Engineering, China Electronic Product Reliability and Environmental Testing Research Institute, China), Ming Chen (Jinan University, China Electronic Product Reliability and Environmental Testing Research Institute, China), and Renhuai Liu (Jinan University, China Electronic Product Reliability and Environmental Testing Research Institute, China)	
Robustness Analysis of two Simple Networks	. 346
Research and Modeling of Tunnel Characteristics Based on Leakage Cables	. 352
Research on Application Software Architecture Under the Project Management Informatization of Power Grid Enterprises	. 357
Design of Automatic Indoor Intelligent Flowerpot and Planting System	. 362
Analysis and Research on Relevant Methods of Short-Term Passenger Flow Forecast	. 368
Computer Remote Monitoring System	. 373
Research on Three-Dimensional Active Safety Technology of Power Plant Based on High-Precision Computer Positioning Technology	. 378
Design of Intelligent Positioning Device for Group Exercises Based on Bluetooth Communication Technology Min Zhou (Wuhan Railway Vocational College of Technology, China) and Haichao Yu (Wuhan Railway Vocational College of Technology, China)	.382

Designing for Maximum Power Output in Wave Energy Systems Li Min (Sichuan University, China)	386
Research Based on Improved Genetic Algorithm in the Optimization of Running Shoe Sole Side Profile Shape	393
Xiaoyu Miao (Sichuan Agricultural University, China), Liming Wang (Sichuan Agricultural University, China), and Guixin Yu (Sichuan Agricultural University, China)	
Research on Intelligent Digital Information Platform Under Computer Artificial Intelligence Technology	400
Analysis of the Difficulty of Elementary School Application Problems Based on the TFIDF Algorithm of the Spatial Vector Model	405
Application Research of Interior Design Under Computer 3D Simulation Graphics CAD Modeling System	
Establishment of Motion Model of wave Energy Device and Determination of Damping Coefficient Based on PSO Algorithm	415
Vector Object-Based Architecture Modeling Method and Condition to Dense well Data	421
Research on Capacity Allocation of Community Integrated Energy System Planning Based on Multi-Objective Optimization	429
Design and Implementation of Advanced Mathematics Assisted Learning System Based on Learning Analysis Technology	436

Satisfaction Prediction Based on XGBoost Classification and Decision Tree Model
Incentive Mechanism Design for Joint Resource Allocation in Post-Quantum Blockchain-Based Federated Learning
Research on Olympic Games Hosting Strategy Based on Machine Learning Algorithm
Research on a VR Based Computer-Aided English Writing System
Based-Triangular Residual Approach Grey Correlation Prediction for Internet Development Index
Design of Polarization-Maintaining Photonic Crystal Fiber and Its Application in Highly Coherent Supercontinuum Generation
Research on Bidding Model of Virtual Power Plant Trading Based on Electric Carbon Coupling 483 Xin Hu (Guangdong Power Exchange Center Co, Ltd., China), Cai Jiarong (China Southern Power Grid Digital Grid Group Co., Ltd., China), Huang Kangqian (Guangdong Power Exchange Center Co, Ltd., China), and Huang Zhisheng (Guangdong Power Exchange Center Co, Ltd., China)
Full-Scale Tests and Optimization Studies on Suspension Strings of the Ground Wire of UHVDC Transmission Lines

Cause Analysis and Diagnosis of Transformer Core Grounding Fault Limin Qu (State Grid Heilongjiang Electric Power Company Limited Electric Power Research Institute, China), Jian Zhang (State Grid Heilongjiang Electric Power Company Limited Electric Power Research Institute, China), Chao Wang (State Grid Heilongjiang Electric Power Company Limited Electric Power Research Institute, China), Yuenan Guo (State Grid Heilongjiang Electric Power Company Limited, China), Mingchen Gong (State Grid Heilongjiang Electric Power Company Limited Electric Power Research Institute, China), Hang Zhang (State Grid Heilongjiang Electric Power Company Limited Electric Power Research Institute, China), Xiangyu Zhao (State Grid Heilongjiang Electric Power Company Limited Electric Power Research Institute, China), and Deyang Dong (State Grid Heilongjiang Electric Power Company Limited Electric Power Research Institute, China)	191
Mechanism of Temperature Influence in Thickness Measurement Using Eddy Current Sensors 4 Zihan Li (Beijing Institute of Technology, China), Xiuqi Yuan (Beijing Institute of Technology, China), and Tong Zhang (Beijing Institute of Technology, China)	196
The Standardized Management of Power Grid Project Settlement Based on Digital Technology 5 Huali Xia (State Grid Zhejiang Electric Power Co., Ltd., China), Long Li (Zhejiang Electric Transmission & Transformation Co., Ltd., China), Jing Wang (State Grid Zhejiang Electric Power Co., Ltd., China), and Dongdong Lu (Zhejiang Electric Transmission & Transformation Co., Ltd., China)	501
Design and Performance Analysis of a Throwable Variable Structure Robot	506
Design of Cockpit Business Platform for Modular and Intelligent Power System Operation	512
On-Line Verification Method of Electric Vehicle Off-Board Charging Electromechanical Energy Meter Based on CAN Communication	517
A Network Survivability Evaluation Method Based on PDRR Model	522

Research on Prediction of Ship Lateral Replenishment Position Status Based on Wave Compensation	27
Huang Yuting (Changchun Automobile Industry Institute, China) and Ding Mao (Audi FAW NEV Co.Ltd., China)	_,
Analysing Structural Deformation Monitoring of Flight Vehicles Based on Optical Fibre Sensing Technology	31
Establishment and Application of Diesel Exhaust Aftertreatment System Based on Virtual Testbed	
LSTM-RF-PSO Combined Algorithm for Short-Term Passenger Flow Forecasting in Scenic Areas 5. Jianxun Chen (People's Public Security University of China, China), Peng Chen (People's Public Security University of China, China), and Haishuo Gu (People's Public Security University of China, China)	44
Big Data Visualization System Based on Target Data Query	49
Network Big Data Visualization Information System	53
Construction and Evaluation of Enterprise Operation Risk Early Warning Model Based on Decision Tree Algorithm and Electric Power Big Data	58
Risk Analysis and Prediction of Enterprise Operations Based on Random Forest Algorithm and Power Big Data	63
Design of an Intelligent Pet Feeding System	68

Dynamic Wind Farm Power Prediction Method Based on Cluster Analysis	574
A Marketing Risk Inspection Model for Electric Power Enterprises Based on Capsule Network Under Regulatory Background	579
Integrated Design of Automated Cage Chicken Control Based on Electromechanical Control System	584
Application and Research Based on Random Forest Regression and CRITIC Methods	591
3DMAX-Based Roaming Design of Interactive Architectural Landscape	595
Clinical Nursing Strategies for Pulmonary Disease Patients Based on Random Forest Algorithm	600
Research on Economic Benefit Measurement Algorithm of Cultural Industry Based on Fuzzy Proximity Rongchang Liu (Jangsu Jiyang Software Co., Ltd, China) and Chengfeng Sha (Logistics Management Office of Nanjing University of Chinese Medicine, China)	604
Research on the Construction of Educational Decision Support System Based on DM Technology Lu Xia (Wuhan University of Engineering Science, China)	609
Research on Process Control Technology of Wood-Plastic Composite Co-Extrusion Based on Fuzzy PID Control Algorithm	. 613
Research on Intelligent Assessment Algorithm of English Teaching Diagnosis System Based on SVM	618
Construction Strategy of Complex Economic Simulation System Based on Grey Model	. 622
Economic Data Analysis and Intelligent Prediction Based on Intelligent Matching	. 626
Music Depth Recommendation Algorithm Based on user Data Mining	. 630

Research and Implementation of Auxiliary Decision System for Consumer Finance Based on Random Forest Algorithm Nanlan Du (Hubei Three Gorges Polytechnic, China)	635
Simulation Calculation of National Compulsory Education Information Infrastructure Construction Based on Data Mining Algorithm Suman Han (Shanghai Normal University Tianhua College, China) and Mengxuan Gao (Shanghai Normal University Tianhua College, China)	. 639
Research on Bayesian Financial Panel Data Model Based on BP Neural Network	645
Music Recommendation Algorithm Based on Music Melody Profile Analysis	. 649
Research and Simulation on Optimization Model of Non-Full Load Logistics Supply Chain Based on Manufacturing Resource Constraint	. 653
Recognition Algorithm of Transaction Risk Events in Automobile Financial Market Based on Deep Learning	. 657
Construction of Intelligent Financial Management Platform Based on Hierarchical Inheritance Algorithm	. 663
Construction of Dynamic Detection and Analysis System for Students' Work and Employment Peng Li (Shanghai Xingjian College, China) and Xue Wang (Shanghai Xingjian College, China)	. 669
Optimization Algorithm of Sound Absorbent Performance of Sintered Metal Fiber Materials Based on Deep Learning	. 674
Optimization Query Algorithm of Distance Education Database Based on Student Behavior Analysis Fang Gao (Changchun Sci-Tech University, China)	. 680
Construction of English Assisted Translation Learning System Based on Improved GLR Algorithm Gongping Yang (Shanghai Xingjian College, China) and Lei Shi (Shanghai Xingjian College, China)	. 685
Research on Intelligent Analysis and Judgment of English Word Part of Speech Based on Improved GLR Algorithm	. 690
Design of English Translation Intelligent Recognition Model Based on Markov Model	. 695
Optimal Scheduling Strategy for 5G Base Station Backup Energy Storage Considering Dispatchable Potential	. 699

Research on Underground Mine Coordinated Operation Scheduling Based on HFSP	.704
Design of Auxiliary Evaluation System for Aerobics Competition Based on Intelligent Optimization Algorithm You Yang (Wuhan Qingchuan University, China)	709
Research on Oral English Learning Platform Based on Intelligent Recognition	714
Optimization Design Research of Bionic Reinforced Structure Layout for Heavy Load Turntable Plane Huidong Huangfu (Northwest Institute of Nuclear Technology, China), Jianhua Zhang (Northwest Institute of Nuclear Technology, China), Peng Zhang (Northwest Institute of Nuclear Technology, China), Sijin Xiong (Northwest Institute of Nuclear Technology, China), and Jiachen Shen (Northwest Institute of Nuclear Technology, China)	. 720
Research on Optimal Operation of Multi-Park Integrated Energy System Considering Low Carbon Economy	.725
Cost Estimation Method of 220KV Transmission and Transformation Project Based on 3D Information Model Shangke Liu (State Grid Ningxia Electric Power Co. Ltd Eco-tech Research Institute, China), Zheng Wang (State Grid Ningxia Electric Power Co. Ltd Eco-tech Research Institute, China), Yanli Xiao (State Grid Ningxia Electric Power Co. Ltd Eco-tech Research Institute, China), and Xin Ju (State Grid Ningxia Electric Power Co. Ltd Eco-tech Research Institute, China)	. 731
An Optimization Model for Resident Physical Health Factor Issues Based on XGBoost-SHAP Banxiang Duan (Guangdong Institute of Science and Technology, China), Wencheng Hong (Guangdong Institute of Science and Technology, China), Zexin Lin (Guangdong Institute of Science and Technology, China), and Minxia Huang (Guangdong Institute of Science and Technology, China)	735
Correlation Model of Maternal and Infant Health Indicators Based on Random Forest and TOPSIS	740

Three-Dimensional Finite Element Analysis and Research of Leakage Magnetic Field of Stripe-Like Defect in Petroleum Pipelines74
Feng Zhou (Shandong University of Science and Technology, China), Dali Zhang (Shandong University of Science and Technology, China), Han Zhao (Shandong University of Science and Technology, China), and Heng Hu (State Grid Heilongjiang Electric Power Company Limited, China)
Research on Social Network Transmission Behavior Based on SIMR Model Integrated Baidu Index
Weihao Li (Information Engineering University, China), Yaohui Hao (Information Engineering University, China), Heyu Chang (Information Engineering University, China), and Yongfei Wang (Information Engineering University, China)
Research on Stability Control of Active four-Wheel Steering Based on Linear Quadratic
Regulator
Research on air Quality Prediction Based on Correlation Analysis and XGBoost
Structural Optimization of a Flapping-Wing Vehicle Based on Linear Module Actuator
Elderly People Balance Ability Based on Real-Time Training Model
Health Status Assessment of Line Pan of Scraper Conveyor Based on Cooperative Game Method
and Immune Principle
Research on Standard Scheme of Battery Swapping Mechanism for Electric Commercial Vehicle 78 Cao Dongdong (China Automotive Technology & Research Center Co., Ltd, China), Hou Xiaoyi (China Automotive Technology & Research Center Co., Ltd, China), Liu Shaohui (China Automotive Technology & Research Center Co., Ltd, China), Zhang Baoqiang (CATARC New Energy Vehicle Test Center (Tianjin) Co., Ltd., China), Xu Xiao (China Automotive Technology & Research Center Co., Ltd, China), Li Yang (CATARC New Energy Vehicle Test Center (Tianjin) Co., Ltd., China), and Tianlei Zheng (China Automotive Technology & Research Center Co., Ltd, China)

Research on Vehicle Routing Problem with Time Window and 3D Loading Constraint Consid Carbon Emission Costs	
Zhiwen Yang (Shanghai University, China) and Si Zhang (Shanghai University, China)	
Design and Parameter Calculation of wave Energy Devices Based on Industrial Design Theor Sanqing Tang (Nanchang University, China) and Ruoshu Li (Nanchang University, China)	y 795
Differential Flatness and Minimum Snap Trajectory Generation for Cooperative Manipulation of Quadrotors Slung-Load System	
Research on Modeling and Simulation of Six-Axis Manipulator Based on D-H Coordinates Anlan Yin (Harbin Engineering University, China) and Qianchen Guo (Harbin Engineering University, China)	807
Design and Implementation of Intelligent Navigation System in Intelligent Tourism Environment Lin Shi (Memorial Hall of the West Road Army of the Chinese Workers' and Peasants' Red Army, China)	812
BP Neural Network-Based Prediction of Economic Policy Uncertainty Indices and Innovation Risk Avoidance Mingan Zhu (Harbin Institute of Technology, China) and Weihan Luo (Harbin Institute of Technology, Shenzhen, China)	
Research on Electric Vehicle Charging Monitoring System Based on Cloud Computing Big Da Analysis Technology	