

2025 International Conference on Electrical Automation and Artificial Intelligence (ICEAAI 2025)

**Guangzhou, China
10-12 January 2025**

Pages 1-731



**IEEE Catalog Number: CFP259A9-POD
ISBN: 979-8-3315-0680-3**

**Copyright © 2025 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:	CFP259A9-POD
ISBN (Print-On-Demand):	979-8-3315-0680-3
ISBN (Online):	979-8-3315-0679-7

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Table of Contents

A multi-dimensional view of the differences in accounting for emission factors in the Chinese power grid-Based on spatio-temporal and emission boundary characteristics	1
Qing Liu, Yang Zhao, Yuyang Jiao, Ying Zhang	
Optimizing Wind Energy Integration in Power Systems: Policy Impacts and Unit Commitment Analysis for Decarbonization	5
Zhongyi Meng, Donghe Li	
Comparison Study of Carbon Footprint of Different Transformer Models in Low-Voltage Distribution Networks	14
Sirui Yang, Yanchi Zhang	
Multi-Timescale Loss Reduction Optimization Study of Distribution Network Considering Flexible Charging of Electric Vehicles	19
Ruogu Wang, Qi Dong, Xin Gao, Xiaoteng Li, Yanpeng Jin, Yangyan Guo	
Optimization model for comprehensive energy grid consumption capacity under health monitoring	26
Wuxiao Chen, Chenhan Zhang, Zhiyun Jiang	
Setting of relay protection setting for distributed photovoltaic access distribution network based on GSA algorithm	30
Ying Liu, Tiepeng Sun, Huidan Tan, Junyang Tian	
Operation Optimization of Micro-Grid Group Sharing Energy Storage Based on Game Theory	34
Tianyu Li, Quanli Guo	
Offshore Wind Power Transmission Planning Considering Extreme Weather Scenarios	38
Zhen Pan, Qingming Xin, Lijuan Huang, Hui Qin, Ting Hou, Lingfei Li	
A Study on the Detection of Sub-metering Errors of Electrical Energy in Distribution Networks Based on Wavelet Neural Networks	45
Hengjing He, Jinyang Du, Leping Zhang, Hanfang Ye, Bensong Zhang, Xin Rong	
Refined Resource Allocation Algorithm for Power Trading Centers Based on User Service Needs	53
Na Cai, Shuibing Zheng, Shouquan Luo, Hang Gao, Danqi Chen	
Electricity spot market supervision risk assessment model in a provincial level	57
Yi Li, Wulei Xue, Yi Zhang, Xiande Zheng, Liumao Yang	
Research on the Optimal Bidding Strategy of Electric Vehicle Aggregators in Power Markets Considering Uncertainties	62
Tong Lu, Ruyue Han	
Efficient Energy Dispatching for User-Load Smart Nano-Grids	67
Adugna Gebrie Jember, Ruiyu Bao, Jiayi Liu, Zhao Wang, Zhenyu Zhou	
Multi-Source Coordinated Fault Recovery Strategy for Flexible Distribution Networks with SOP	74
Dan Chen, Jiaxiang Deng, Jian Shi, Kai Zhao, Tianyi Guan, Mengsen Liu, Zhang Xue	
Distributed Energy Trading Mechanism Based on Supply-demand Ratio Pricing and Fair Clearing	82
Qian Wang, Yitong Liu, Yi Xie, Xingcheng Liu	

Two-stage clearing model of electricity-carbon coupling day market considering user demand Zhuangzhuang Cao, Dabo Zhang, Zongrui Wang, Fan Wu	87
Research on Cost Recovery of Pumped-storage Power Stations in the Electricity Market Environment Yihan Zhao, Peng Wang, Yushan Zhang, Zhengpai Cui, Xiaoxue Liu	93
Analysis of Oscillations in Wind Farms Integrated into the Grid through Flexible Direct Current Transmission Systems Hui Liu, Yi Zhang	100
Reliability Evaluation Method of Communication Network Applicable to New Distribution System under Extreme Disasters Linfeng Chen, Bingsen Xia, Cui Li, Zhaozheng Zhou, Puyang Zhang	105
Verification and testing of Emergency Stability Control for Micro-grid in Industrial Park Zaixin Yang, Tao Han, Yannan Qu, Yedong Taopu	111
Analysis of the influence of grid characteristics of low voltage circuit breaker on arc extinguishing process Bo Liang, Haiyan Dong, Jinyu Mao	115
A trusted measurement model of AI algorithm for power grid scheduling in predictive scenarios Zhihua Wang, Hongjin Ren, Zheng Han, Hongfu Chen, Yutao Liu, Youlin Hu, Feng Gao	119
Operational Optimization Strategy for Virtual Power Plants Considering Carbon Trading and Demand Response Wenliang Li, Tao Zhou, Canxiang Guo, Shukai Yue, Peng Wang	124
The highest priority setting method of power system dispatching based on time series Qi Feng, Zihan Weng, Zeyu Chen, Lidong Chen, Bo Wang	130
Research on the Strategic Planning of New Power System Considering the Cooperative Optimization Operation of Source and Network Load and Storage Under the Dual Carbon Target Tong Wu, Zhanying Wang, Zongyuan Wang, Mengzi Zhang, Zehao Wang	134
Research on Model Matching and Anomaly Detection Method of Distribution Network Equipment Based on OCR and Image Recognition Juan Bai, Zhenjun Xie, Chang Li, Shulei Feng, Yu Zou	139
Research on Distribution Grid Line Defect Identification and Classification Methods in UAV Inspection Bin Liao, Zipei Guo, Maotian Liao, Xiaonan Shen, Yu Zou	144
Optimization and Scheduling of VPP Under the Electricity Market Mechanism Considering Carbon Emission Costs Bao Wang, Li Zhang, Zhumeng Song, Fei Wu	149
Deep Learning-based UAV Visual Recognition System in Distribution Network Defect Detection Mingmei Zhang, Mingzhi Bin, Yinguan Song, Weitang Liu, Yu Zou	155
Distribution circuit load forecasting and warning system based on prophet Zhouyi He	160

Analysis of the Economic Feasibility of Power Substitution Potential at the Industrial Park Level Based on Mixed-Integer Linear Programming and Its Application in a Pharmaceutical Park	166
Yunfeng Li, Yutao Xu, Yong Xiao, Qihui Feng, Yun Zhao, Yuelang Zhang	
Research on Distribution Network Zoning Planning Method Based on Community Discovery Algorithm	172
Yuchi Zhang, Quanli Guo	
Construction of Knowledge Graph of Power Defect Faults Based on Deep Neural Networks Considering Attention Mechanisms	176
Zhenyu Guo, Tao Zhu, Daojun Huang, Shiming Hu	
Distributed Photovoltaic Multi-Cluster Hierarchical Control Strategy Considering Voltage Quality of Distribution Network	181
Chunlei Hou, Lishi Du	
Economic Analysis of Mid-term and Long-term Power Transmission Corridors Access to Beijing and New Power Transmission and Transformation Projects in Beijing	186
Wei Zhao, Jing Zhang, Yan Pan, Peng Xu, Fuqiang Li, Hao Sun, Hao Shi, Qian Ma, Gang Luo	
Research on Double-Layer Scheduling of Multi-Energy Microgrid Systems Based on Rolling Optimization Strategy	198
Jin Yu, Shaojiang Liu, Jun Tang	
The Intrusion Detection Method for Power Grid Industrial Control Systems Based on Improved Triplet Neural Network	203
Kunsan Zhang, Song Zhang, Siqi Pan, Jinhuang Lin	
Analytical Calculation of the Frequency Nadir in Power Systems Based on Virtual Inertia Constant of Grid-Following Energy Storage	208
Wen Hua, Donghao Wu, Xiaolei Yang, Mengke Lu, Yeli Zhang, Shichun Li	
Low-frequency Stability Analysis of Grid-Forming DFIG	215
Junyan Yan, Peng Zhang, Lanxiang Lou, Jiaying Xv	
Improved Market Mechanisms Task Allocation Method Based on Particle Swarm Optimization	219
Leng Han, Zixuan Li	
Day-ahead scheduling method for multi-type resource demand response for power grid regulation demand	223
Jia Pan, Zhenxin Qi, Hao Li, Shuo Meng, Jiangnan Pei, Tianshu Li	
Consider PV participation in electricity and frequency regulation market trading mechanisms that include energy storage	230
Yuwei Wang, Yu Shi, Peiguang Chen, Yunfei Chu	
Research on the Cost-Benefit Analysis Method for Joint Operation of Distribution Network Edge Resources Based on Multi-Energy Complementarity	235
Tao Li, Bo Wang, Yiliang Liao, Ze Zhang	
Research and Practice on the General Method for Designing Microgrids in New Power Systems	241
Ruonan Hu, Taiyun Zhu, Cheng Zhao, Yixuan Li	
DC microgrid arc fault diagnosis based on feature frequency extraction and kernel extreme learning machine	248
Ruixiong Yang, Yong Chen, Yingjie Zeng, Shuping Gao	

A study of the Optimization of Magnet Power Supply Control Strategy for SC-200 Proton Accelerator Beam Transport Line	253
Zhenyu Li, Jian Zhang, Yiyun Huang, Yu Zhou	
Research on the comprehensive evaluation of the power market trading mechanism based on the fuzzy hierarchy analysis method	263
Chao Wang, Jianyu Chen, Xianwei Zhang, Wentao Feng, Xujun Zhang, Zongyao Zhu, Zefan Zhou, Qianyu Cao, Jihui Zhang	
Power big data imbalance analysis based on deep learning OCR algorithm	269
Chao Liu, Shuang Yang, Xi Wang, Feng Xu, Yiran Zhai, Dingwen Zhang, Shuxiu Liu, Ning Li	
Research and Development of Hybrid Intelligent Enhancement Analysis and Control System for Stability of Large Power Grid	274
Min Zhao, Yalou Li, Ping Ding, Fang Li	
Research on economic analysis and comprehensive evaluation method of compressed air energy storage	278
Zibo Han, Ran Chi, Ning Wang	
Research on Electricity Theft Identification Method Based on Multi-Component Feature Fusion	284
Yuli Wu, Chenyang Zheng	
Considering the Multi-Principal Gaming Transaction Model of Carbon-Green Certificates under Blockchain Architecture	289
Haomiao Wang, Yan Guan, Tianbo Wang, Shuang Yang, Lei Feng, Xuesong Liu, Qing Lv, Fan Yang	
Study on the Impact of Primary Energy Price Fluctuation on Electricity Price	297
Yuhao Zhu, Minde Liu	
A GNN Based Voltage Sensitivity Perception Method for Distribution Networks with Variable Topology	302
Keyang Li, Chuanhuai Ji, Shuona Li, Yajie Tang	
Pseudo-Measurement Generation Method Based on GCN-Transformer for Lightweight Measurement Distribution Networks	308
Chuanhuai Ji, Keyang Li, Zhengtao Wu, Qifan Feng	
Impact of Lightning Strike Waveform and Position on Transient Overvoltage in a 500 kV HVAC System	313
Tao Cui, Zhengxi Wang, Tao Liang, Xiaohui Wu, Zhengzheng Fu, Tongwei Guo, Jie Guo	
Multi-Device Data Fusion IoT Monitoring System for Home Safety	318
Jianying Ye, Hantao Chen, Lina Zhang, Kefeng Peng, Jun Tang	
Research on Fault-tolerant Dual Active Bridge Converter Based on Half-bridge Multiplexing	322
Yufei Guo, Baihui Yuan, Qian Wu, Yiliang Li, Yijie Wang, Dianguo Xu	
Modeling method for hybrid ripple estimation of general PWM converters based on KBM theory	328
Zhaoxuan Sun, Liping Chen, Jianwan Ding	
A Speed Estimation Method for Gear System based on Cyclic and Vibration Spectrums	341
Chengshan He, Rui Xu, Lianhao Chai, Cheng Hua, Lin Liang	

Bi-directional Power Flow Simulation of Permanent Magnet Linear Machine for Gravity Energy Storage	346
Yi Feng, Song Chi, Jianhu Yan	
Design and Application of a Microwave-Based Sensor for Water Content in Crude Oil	351
Linghao Dai, Ningbo Liao, Jun Lan, Miao Zhang	
Design of a Distributed Fiber Optic Online Temperature Measurement System for 10kV Intelligent Overhead Transformers	356
Rong Rong, Yingxian Lu, Hanrong Li, Jiaquan Li, Haijing Liu	
Variable Speed Wind Turbine Control System with Doubly-Fed Induction Generator	361
Maged Al-Barashi, Yongjun Wang, Zeyu Tang, Mohammed Alameer	
Control Method for Butterfly-Inspired Flapping-Wing Aircraft Using Fluid Dynamics Theory	368
Siqi Zhang, Lin Zhang	
Small sample maintainability analysis of CNC machine tools	372
Xiaofeng Wang, Liudi Wang, Shiru Guo	
Componentization of thermo-fluid coupling simulation based on LBM	377
Xue Chen, Xuesong Wu, Jianwen Cao, Baoping Ye	
CNC Machine Tool Operation Status Monitoring System Based on Digital Twins	381
Zhichao Sun, Huazhen Liu, Bingchen Yan, Hanze Li, Chunfang Li, Linsen Song, Li Tian, Yiwen Zhang, Zhenglei Yu	
Research on Overheating Identification Technology for Substation Equipment Area Based on Infrared and Visible Light Fusion	386
Zhibin Lian, Zongbao Ding, Yongchang Lin	
Scheduling Strategy of Household Energy Management System based on Multi-Objective Optimization	391
Yuting Sun, Hongyong Zhou, Yu Zhou, Fengbiao Song	
Active Rotor Vibration Control of Rotating Machinery When Passing Through A Critical Speed	398
Xing Shao, Zhou Pan	
Research on a High-reliability and Low-loss Power saving Fast Switching Device Based on Fast Mechanical Switch Combination of Eddy Current Repulsion Operating Mechanism	403
Shaojie Liu, Yingying Zhao, Tangyun Xu, Yue Tian	
Research and application of automatic tobacco baking system based on multi-source fusion	409
Shuwei Chen, Shuai Shi	
Wideband Transformer Model Based on Combined Fitting Method	417
Longyu Kang, Zhuohong Pan, Zijian Jia, Bo Zhang	
Vehicle electromagnetic compatibility test business management system based on big data platform	423
Xiaomin Zhang, Guangyu Zhang, Jiandong Guo, Yifu Ding	
Multi-objective Optimization of Permanent Magnet Assisted Synchronous Reluctance Motor	429
Cheng Cheng, Yong Yan, Chao Ye, Lin Zhang, Xiao Liu	

Configuration tree-based network device parameter generation and deployment framework	434
Defu Ni, Yu Yang, Yue Shen, Chong Xu, Jian Gong	
Detect and Minimize Reverse Power Flow in a Renewable Energy Distribution System	439
Yi Chen, Yanchi Zhang, Youguo Bi	
A composite controller for the intelligent rail bulk cargo unloading device	444
Xiaoqi Fan, Chao Lu, Xiaodong Lv, Guangming Zhang	
Power Line Noise Acquisition and Analysis System for the 0-50MHz Frequency Band	449
Enguo Zhu, Ran Li, Yi Ren, Xuan Li	
DSSC Device Simulation Modeling and Optimization Configuration Method based on WOA	455
Jie Zhang, Sizhuo Lv, Chao Zheng	
Multi energy collaborative optimization model for integrated energy system under multi-mode ice storage air conditioning	460
Chao Chai, Songyang Liu, Shaokun Jia, Weikang Kong, Jie Zhang	
Research on Energy Efficiency Improvement Strategy of Air Conditioning in Comprehensive Energy System Based on Neural Network Algorithm	464
Miao Shan, Jie Liang, Chao Chai, Shaokun Jia	
Research on the operation optimization of wind storage combined system based on compressed air energy storage technology	468
Yitao Lang, Zuxu Zhou, Quanliang Liu	
Thermal performance analysis of 1000MW secondary reheating EC-BEST unit under variable operating conditions	474
Xinhong Tong, Zongren Wang, Chaoyuan Dong, Dongxing Zhang, Yuanzhi Zhou, Huikun Ma	
An MILP Approach Based Optimization Techniques for Offshore Wind Farms Electrical Collector Systems	480
Lijuan Huang, Ting Hou, Zhen Pan, Min Cheng, Yining Zhang, Qingming Xin	
Research on Real-time Data Acquisition Technology of Dispatching Automation System Based on Container	485
Huichao Wu, Mingyi He, Haizeng Wei, Ying Fan	
Design of a Vehicle Personnel Stay Prevention and Early Warning System Based on Wireless Local Area Network	491
Shangyu Wang, Xiaoying Lv	
Composite generator for wave energy acquisition	496
Yi Zhang, Wentao Feng, Ping Li, Enbo Tang, Zeyu Xu, Mingze Tang, Yutong Bai	
Automatic Sorting System for Citrus with Fast Visual Recognition and Improved Multi-Criteria Clustering	501
Jianuo Jiang, Fei Liu, Jiyu Peng, Fengle Zhu	
Design and Simulation of Electric Jet Pre-cooling Control System Based on Systems Engineering	508
Haobo Sun, Lifeng Cui, Wentao Li	
Multi-layer power generation unit triboelectric nanogenerator	517
Wentao Feng, Yi Zhang, Ping Li, Yongzhou Wang, Zeyu Xu, Mingze Tang, Xiangrui Gong, Bin Zhang	

Comprehensive Variable Weight Quality Evaluation of Oil immersed Transformers Xiaoxiao Zhao, Yuanyuan Xu, Yuxin Yun, Xi Wang	522
A Dual-Side-Detuned Series-Series Compensated Inductive Power Transfer System with Plane Misalignment Tolerance Yiming Zhang, Peiyao Rao, Ronghuan Xie, Hui Wang	527
Mobile Robot Navigation using ORB-SLAM3: A Multi Modal Autonomous System Ariano Da Conceicao, Lianfang Tian, Qiliang Du, Ling Yuan	531
Design and Finite Element Analysis of a 4MW Pumped Storage Doubly-Fed Induction Generator Hucheng Xu, Wei Xie, Ye Zhang	536
Electromagnetic design and simulation analysis of 3.5MW doubly-fed machine Ye Zhang, Wei Xie, Hucheng Xu	541
Study on the effect of space radiated electromagnetic interference generated by AC filter busbar VFTO on secondary system Wei Shen, Sen Wang, Weibin Si, Xinyu Hao, Wei Li, Mingxi Zhu	545
Research on Planning and Optimization of Integrated Energy Systems for Zero-Carbon Industrial Parks Considering CCS-P2G Coupling Rui Tian, Chen Fu, Lipan Fan	552
Differential-based Non-contact Optical Sensor for Transient Signal Measurement Method and System Chao Yang, Yong Ouyang, Changjin Hao, Hua Liu	559
Design of measurement and control system of suspension support device based on LabVIEW and FPGA Naijian Zhang, Han Wu, Zhongwei Du	564
Coordinated Control Strategy for Multi Hybrid Active Power Filters Chen Wang, Bo Yang, Yutong Wu, Mingshu Li, Xingyang Li, Jingyuan Yin	570
A multi-mode three-phase bidirectional CLLC resonant converter Xiaodong Li, Yuzhuo Pan, Tianying Wu, Congpeng Chen	577
Manipulator System Hand-Eye and Tool Matrix Joint Calibration Algorithm based on Error Analysis Model Xuegang Zhang, Jiexiang Li, Kang Yuan, Hao Liu	581
Dynamic torque correction method for high-power permanent magnet synchronous motor based on temperature compensation Xiaoman Chi	588
Multi-time scale simulation of integrated energy system based on finite difference approximation Wentao Yang, Aochen Jin, Hao Sun, Wenbin Yang	593
Optimal Energy System Scheduling Based on Safe Deep Reinforcement Learning Algorithms Jinyan Cao, Xiaohong Nian, Xiaofei Deng, Ziqi Yang	599
Flexible Scheduling Optimization of Four-Way Shuttle Systems Based on Improved Genetic Algorithm Kaiqian Lei, Qin Zhang, Yang Xiang	604

Impedance Modeling Method Considering the Phase of the Grid Connection Point in Grid-forming and Grid-following Converter Multi-machine System	609
Yue Ma, Ning Chen, Yibin Tao, Luming Ge	
Modeling and analysis of Train Control Center simulation system based on CPN	616
Sheng Luo, Tao He	
Multi-objective optimal operation of an integrated energy system with electricity to hydrogen taking into account uncertainty and generalized energy storage	620
Zhaoyang Wang, Jinwen Chen	
Research on pricing method of electric vehicle charging pile optimization based on particle swarm optimization algorithm	628
Yue Gan, Lichun Tian, Min Zheng, Nan Ye	
Research on high-precision dynamic adjustment real-time control technology for new energy	633
Longhao Liu, Kunjun Zhang, Jiahui Zhang, Rongrong Zhan, Huai Liu	
Multi-objective optimization strategy of microgrid based on cooperative operation of optical storage in industrial park	638
Long Jin, Yanchi Zhang	
Study on the development of discharge pattern of defect in resin-impregnated paper bushing materials	643
Jufang Wei, Chun He, Bo Qi, Xiaoguang Ma, Chuang Ma, Dong Liu, Junji Feng, Minghui Duan, Xiao Yang	
Two-layer optimal scheduling model of zero-carbon park based on economy	649
Rui Tian, Chen Fu, Lipan Fan	
Integral Robust Strategy for Pressure Control of Electro-Hydraulic Proportional Servo Valves	656
Shangyou Chen, Jian Hu, Jianyong Yao	
An Improved Cold Startup Strategy with Bias-Flip Rectifier for Piezoelectric Energy Harvesting System	661
Runzhi Yuan, Minyu Liu, Yufei Zhou	
The study on influence factor of vertical transportation pricing of underground substation based on AHP	665
Chao Ma, Yubo Ma, Jian Ma, Sinuo Zhou, Shaoze Wei	
Research on Online Identification Method of Foreign Object Invasion in Transmission Lines Based on Image Monitoring	670
Cheng Chen, Han Zhang, Xianman Chen, Peng Lin, Shipeng Yuan, Jianpeng Wen	
A Non-contact Voltage Measurement Technology for Three-phase Cables	676
Xiangyu Shen, Yihang Xu, Weijian Zhuang, Nan Xie	
Research on circuit architecture of SAR ADC	680
Haifeng Qian, Chunyao Du, Zhongning Cui, Rong Wang, Shirui Zhang, Juan Hua, Xiaolu Liu	
The impact of changes in primary energy prices and electricity prices on the industrial energy structure	686
Yuhao Zhu, Minde Liu	

Deformation analysis method for substation expansion joints based on multi-scale feature fusion	691
Yong Zhang, Huaqing Cao, Zhifei Zhang, Yuqing Yao	
An Energy Minimization Scheme for NOMA-MEC	698
Han Xiao, Yitong Liu, Xingcheng Liu, Yi Xie, Peiran Wu, Yang Yi	
The Impact of Different Environments on Lightning Induced Voltages of 10kV Overhead Lines	702
Guangsi Chen, Yilan Luo, Zhenfeng Yan	
Research on Demand Side Response Pricing Mechanism Based on Fuzzy Reinforcement Learning	707
Hailang Zhou, Peipei You, Yanlin Li, Cheng Wang	
Reliable aggregation optimization technology for large-scale variable frequency air conditioning load under multiple rotation control	712
Xiaotao Nie, Xiaohu Cheng, Minmin Huang	
Electro Magnetic Compatibility Analysis of Signal Interference on Ultra-Low Power Four-Level ECT	716
Yong Zhang, Zhichao He, Xiangyu Shen, Nan Xie	
The importance of natural gas and LNG in the clean Energy transition for international oil companies	721
Shi Tang, Jiong Zhang, Juan Wang, Simin Zhang, Yimeng Xia, Guisheng Xiang	
The Design of a Miniaturized Dual-frequency Monopole Antenna Applied to The Electricity Meter	727
Hongtao Shen, Chong Li, Hao Wang, Juchuan Guo, Penghe Zhang, Cong Wang	
High-precision current measurement technology of charging pile based on AC/DC comparator and its remote calibration method	732
Jiaying Li, Gang Qin, Xian Yang, Mengke Wu, Qiye Chen, Jiewei Liu	
Research on Virtual Power Plant Resource Aggregation Considering Fast and Slow Charging of Electric Vehicles	736
Ran Lyu, Mingxing Guo, Li Lan, Yanyuan Qian, Chen Fu, Yuan Hu	
Multi-objective Energy Optimization for photovoltaic storage charging station	742
Guizhen Zhou, Chao Ye, Haoyang Cheng, Shaolin Zhang, Xiao Liu	
Study on the Measurement of Hydropower Feed-in Tariff based on Capacity Compensation	749
Jian Wu, Qiqi Dai, Xueting Zhang, Junzhi Chen, Yinxue Li, Xinhang Wei	
Lightweight Identity Authentication Algorithm for Electric Energy Measurement Terminals Based on Device Fingerprints and Timestamps	756
Rong Wang, Kexin Liu	
Transmission line meteorological risk classification using multi-source incomplete data	761
Junxing Hu, Yun Li, Junfeng Yuan, Jiehua Yu	
Electrical Fast Transient/Burst (EFT/B) for Outdoor Mobile Power	767
Shujun Tan, Shenyao Fu, He Li	
Research on the distinction method of partial discharge inside and outside the windings of 110 kV transformer in early operation	773
Junqi Chang, Xing Tang	

Status assessment of transmission line poles and towers based on multi-technology fusion Hongwei Ai, Yuhao Xu, Longjiang Wang, Shiqi Wang	777
Lightning Ignition source control technology for Aircraft Fuel tank structure Fengwei Guo, Jigang Dai	781
Lithium-ion battery model analysis based on Levenberg-Marquardt algorithm Yu Kuang, Yanchi Zhang	786
Multi-agent assisted generation method of typical electrical switching operation tickets based on topology analysis Minmin Wu, Tieyi Chen, Xiang Ma, Yong Xu, Jianfeng Huang, Qin Lv	791
Research on the Simulation Analysis Method for the External Discharge Path of Flammable Liquids in Civil Aircraft Huiqin Yuan, Wenjie Xu, Chenhan Wu, Yadi Liu	795
A method for extracting the key structural parameters of power towers oriented to point cloud data Yong Zhang, Kaihua Jiang, Mengfei Lei, Te Li, Shaohua Wang, Yingpu Xie, Xiumin Chen	802
Robust time-delay optimal control of 1,3-propylene batch fermentation Chao Sun, Jingjing Jiang, Dingjia Zhan	809
Magnetic field design of Stewart platform legs driven by magnetostriction Zhipeng Feng, Xiaohui Gao, Saisai Tong, Yongguang Liu	813
Temperature distribution measurement and simulation of transmission line arrester under impulse voltage Jun Fu, Zhenxing Zhang, Bangju Han, Kai Cheng	821
A current zero-crossing distortion compensation method based on BP neural network in fast-scanning power supply Shuxian Zhang, Jiang Zhao, Zhongzu Zhou, Yuan He, Huan Jia, Yuanshuai Qin, Shuai Zhang, Ye Liu, Anhui Feng	827
Application and analysis of automatic tuning arc suppression coil in power grid Junliang Liu, Leiyu Chen, Shengjun E, Fucheng Sun, Hongpeng Xing, Puqing Liu, Guangqi Liu, Hong Huo	835
Research on Asymmetric Fault Ride through Control Strategy for Wind Power Based on Three Sequence Current Lu Miao, Wei Fan, Yu Liu, Yang Yi, Deyang Chen, Yingjie Qin, Lu Yan	840
Micro-topographic Feature Extraction for High Wind Risk Prediction of Transmission Lines Ziya Xing, Xiaofeng Gao, Yuqing Wang, Junxing Hu, Yun Li	847
An Impulse Resistance Current Control Method Suitable for Mobile Energy Storage System Haojie Yu, Shi Yin, Yaoxuan Wang, Lijing Sun, Fei Xiao	852
Research on Scanning Frequency and Broadband Impedance Spectroscopy Technology for Cable Defect Diagnosis Jiabao Zhang, Yuchen Zhu, Ye er sen·jin er si	857
Research on High Efficiency Linear Power Supply with Fixed Collector Emitter Voltage Suitable for Magnetically Controlled Resonant Transformers Shaojie Liu, Weihua Ye, Yingying Zhao	866

The Research on Angular Momentum Conservation and Resistance in the Balance of an Upright Rod Under Computer Simulation	874
Yanni Tang, Juncheng Huang, Haoyang Zhang, Zewang Li, Zhenwu Zhang	
Research on defect identification of glass insulators in transmission lines based on target detection and insulator string trajectory fitting	878
Peiwen Zheng, Dan Han, Hongwu Dong, Yanlu Liu	
Simulation study on multi physical field coupling mechanism of surface discharge of contaminated insulators	882
Ping Huang, Zhihao Li, Biao Zhang, Zhenyu Liu, Linsong Fang, Xinmin Zhou, Yongjie Liao	
The error prediction method for voltage transformers based on the EGO-LSTM model	888
Shenglei Du, Huafeng Cao, Yuren Gao, Shangbing Sun	
Research on Energy Consumption and Carbon Emission Prediction for Enterprises in Dongguan Based on Machine Learning	893
Jinxing Zhong, Jiawei Liu, Yikun Liu, Dongsheng Wu, Shiru Zhao, Jinman Luo	
Remaining Useful Life Prediction with Missing Data Using Relevance Vector Regression	899
Tianle Shi, Wei Ru, Shengke Hui, Yougeng Pan, Haibo Zhang, Qing Zhang	
Multivariate load forecasting model based on MTL LSTM-TCN	904
Ruicong Han, He Jiang, Mofan Wei, Rui Guo	
Distributed Photovoltaic Power Forecasting Considering Perceived Data Quality	908
Xiaodan Liu, Chunlei Hou, Lishi Du	
Substation Fire Feature Monitoring and Early Warning Based on Multi-sensor Collaborative Data Fusion	914
Xingsheng Xie, Qifeng Luo, Yongchang Lin	
Detection of Beer Bottle Caps with Defects Based on Improved ShuffleNet V2	920
Jie Luo, Xingcheng Liu, Renwei Ou, Yitong Liu, Yang Yi	
Channel State Information Prediction Using Transformer Models for High-Mobility Wireless Networks	925
Renwei Ou, Xingcheng Liu, Yang Yi	
A Chi-Square Side-Channel Energy Leakage Assessment Method Based on HC Test	930
Chao Liu, Yanjiang Liu, Yingjian Yan, Wubiao Gao, Maohuan Li, Mingdeng Wang	
Optimization of Sensor Health Monitoring Algorithm Based on MAX30102	938
Guotai Sun, Jinhao Zhuo, Qingyi Wang, Cunrong Li	
A line fault detection method based on feature-driven extreme learning machine	944
Zhibo Wang, Ye Tian, Kejian Shi, Taiyu Gu, Haifeng Li	
A review of degradation prediction methods for proton exchange membrane fuel cells	949
Jun Ma, Xiaoqian Liu, Ziheng Wu, Rui Shen, Haining Liu, Fajia Li	
Chain Fault Path Analysis and Risk Assessment Based on Accident Chain Modeling	954
Yanxin Li, Yuning Zhang, Jiawen Yang, Yihong Jiao, Chunming Liu	

Research on Load Forecasting Based on Deep Learning Framework Optimized by Sparrow Search Algorithm	959
Zhaoyu Zeng, Fuyin Ni	
Nonlinear Ultrasound for Damage Detection and Localization in Aluminum Alloy Thin Plates	964
Long Zeng, Shoubin Zhang	
Attention Mechanism-Enhanced Multi-scale Separable Atrous Convolution Method for Motor Bearing Fault Diagnosis	969
Chengyu Wei, Hong Fan	
Predicting Grounding Resistance of Transmission Towers for Enhanced Lightning Protection Using Temporal Fusion Transformer	974
Shichao Cheng, Jiawei Huang, Yan Zheng, Jinlin Ren, Honglin Guo, Hongda Ji, Ziwei Hu	
Analysis on a Resonance Faults Incident of 35kV Capacitor Voltage Transformer	980
Tongwei Guo, Tao Liang, Wei Shen, Sen Wang, Zhe Wang, Yaru Mu, Jie Guo	
CNN-LSTM-based Insider Threat Detection Model	985
Menghua Yang, Junkai Yi, Hejun Zhu, Lingling Tan	
Research on Object Detection of Suspension Clamps Based on Improved YOLOv8	991
Chao Feng, Peng Jiang, Rui Yang, Cheng He, Liang Zhang, Rong Xie, Yajun Zeng, Zhigang Wang	
Analysis of Grounding Fault of Overhead Broken Line in Distribution Network	997
Zhiyu Zhao, Siyuan Liu, Weilin Liu, Yajuan Wang, Yu Cui, Tianle Liang	
A Detection Algorithm of Rail Surface Defects Based on Deep Learning	1002
Yu Du, Jun Zhang, Jinqiang Wang, Hao Fan	
Research on a Data-Driven Safety Risk Assessment Model for Electrical Switching Operations in Substations	1006
Junjie Zhang, Lei Zheng, Nan Wang, Ziya Zhou, Yuxiao Zhang	
A Tobacco Foreign Object Detection Method Based on Intermediate Feature Layer Distillation	1011
Hao Tang, Jianxu Mao, Junlong Yu, Yang Zhao, Yingtian Yu, Shangzhi Liu, Da Chen, Zhenyu He	
Research on Abnormal Electricity Detection and Diagnosis Model	1015
Fating Zhang, Xi Li, Jiuqing Pan, Shuhan Hua, Baogui Ma	
Enhancing Multi-Object Tracking Using Roadside Camera Based on Trajectory Prediction in BEV	1020
Chongchong Wang, Hong Cao	
Transformer Winding Vibration Prediction Based on VMD-DTW-Informer	1024
Xuefeng Wu, Zhongda Pan, Wentong Chen, Zheqiang Hua, Zhong Li	
Photovoltaic power prediction based on improved long and short-term memory neural network model	1031
Huanyou Wang, Guangqi Xie, Xingda Yang, Xiaolong Wang	
Diagnosis and analysis of partial discharge fault of 500kv transformer	1036
Jinghui Ruan, Yongheng Zhong, Ping Peng, Yun Liu, Lipeng Zhong	

Experimental Study of partial discharge in dry-type hollow reactor based on UHF-fibre grating combined detection	1040
Fangjie Wu, Xiaolin Shen, Yang Chao, Bo Qi, Zexuan Yu, Xiao Yang	
Research on Object Detection of Suspension Clamps Based on Attention Mechanism	1044
Feng Chao, Peng Jiang, Rui Yang, Cheng He, Liang Zhang, Rong Xie, Yajun Zeng, Zhigang Wang	
LSTM Based Data Association for Radar Target Tracking	1048
Qiang Zhang, Chun Wang, Yuhao Yang	
An abnormal detection method of electric power equipment based on contrast learning	1053
Kunsan Zhang, Chen Chen, Xiaoping Lin, Siqi Pan, Linyun Fan, Jinhuang Lin	
Online Recognition of Defects and Foreign Objects Based on Wavelet Scattering Convolutional Networks	1057
Zhichao He, Yong Zhang, Xiangyu Shen, Nan Xie	
Research on fault diagnosis method of electrical engineering equipment based on fuzzy neural network	1062
Hongliang Zhou	
Research on user adjustable power load forecasting method based on deep learning and cluster analysis	1066
Jia Pan, Weibo Zhu, Jikai Xu, Bin Zhang, Xiaoyang Zhu, Jing Li	
Research on large signal stabilization control of energy storage grid-connected inverter	1073
Chuxiang Feng, Jiahuan Wang	
Physically Feasible Backdoor Attack in Deep Learning-Based SAR Target Recognition	1080
Fei Zeng, Yuanjia Chen, Yulai Cong, Sijia Li	
Research on Intelligent Perception and Monitoring Technology for Large-Scale Landslides	1086
Chenhui Wang, Qingjia Meng	
Research on the Failure Mechanism and Fault Prediction Method of High Voltage DC Relays	1091
Xili Wang, Xu Chang, Shijun Gai, Yanying Shi	
Deep Multi-attention Network with Earth Mover's Distance for Few-shot fault Diagnosis of guardrail production mold platform	1098
Shikuan Tian, Xinghua Zhao, Guangzhen Liang, Jie Yang, Xiaolong Zhou, Yunshi Yao, Shuyuan Yu	
Research on Intelligent Safety Monitoring and Early Warning Technology for High-altitude Power Work	1103
Liang Zhang, Feng Liao, Shiguo Yang, Xing Li, Shiyang Yang, Shuyu Hai	
Research on staged harmonic prediction and regulation strategy based on deep learning model	1108
Yipeng Xie, Mingcheng Jiao, Lipeng Wang, Guanfu Wang, Fan Zhao, Mingyu Xie, Bowen Zheng, Tongshana Wang, Jing Gong, Jiashun Liu	
Intelligent Geological Subsidence Prediction Based on PSO-RBF Neural Network	1115
Ruizeng Wei, Rijun Li, Hongjiang Wu, Junhao Chen, Lei Wang, Dawei Peng	
An interpretable Photovoltaic Power Forecasting method Based on Temporal Embedding	1119
Airu Zhang, Shichen Su	

A model based on Convolutional Long Short-Term Memory and attention mechanism for predicting the State of Charge of batteries	1126
Zheng Liu, Wenjing Huang, Linfeng Yao, Yanjun Jiang, Siyuan Qiu	
Research on Unmanned Aerial Vehicle Intelligent Inspection System Based on Multi Algorithm Fusion	1136
Zhipeng Jia, Zhanwei Huang, Ting Zhou, Jingchen Yang, Honghong Li, Xueqian Zuo, Qi Xue, Xiaochun Hao	
Model predictive control of dual three-phase permanent magnet synchronous motor with extended virtual control set	1145
Yifei Liu, Yi Zhang, Haifeng Wei, Xiaowei Zhou, Jian Zhang, Lida Shi	
Application Research of micromagnetic prediction intelligent model for residual elongation	1150
Xianxian Wang, Dongbao Ma, Jiaming Li, Changyun Xu, Jian Ou, Kaiwen Xue	
A Deep-Reinforcement-Learning-Based Social-Aware Cooperative Offloading in Mobile Edge Computing Networks	1155
Yuting Li, Yitong Liu, Xingcheng Liu, Yi Xie, Peiran Wu	
A Low-dimensional Optimization Method for Parallel Parking Path Planning	1160
Qiuxia Hu, Guanglun Zhan, Feng Gao, Hongwei Liu	
A branch-and-price algorithm for unrelated parallel machine scheduling to minimize total weighted completion time	1166
Jianfu Chen, Chengbin Chu, Abderrahim Sahli, Kai Li, Wei Xiao, Fulong Xie	
Research on automatic landing and positioning of indoor substation inspection unmanned aerial vehicle based on machine vision assisted technology	1174
Zhong Xie, Rizhao Wang, Zhipeng Xu	
Phase-Aware Speech Enhancement with Dual-Stream Architecture and MetricGAN	1178
Hanlong Wang, Xintao Jiao	
Study on the Normalization Method of the Influence of Detection Distance on Ultraviolet Imaging of Corona Discharge	1185
Weiguo Jiang, Qingzhou Zhao, Zixuan Zhu, Jianing Tan, Longxin Yue, Mingyu Ai	
Multi-attention Enhanced Segmentation Network for Medical Image	1191
Wenlong Zhou, Liming Zhao, Jican Tian, Xing Gao, Zailu Chen, Nengbao Sui, Yiheng Lou	
Research on Text Extraction Algorithm for Metrological Experiment Detection Based on Deep Learning	1197
Jieqiong Han, Shengnan Liu, Cunyu Long, Shiji Ma, Yang Gao	
An adaptive feature fusion Based Network for Aerial-Ground Point Cloud Place Recognition	1201
Di Zhang, Rui Song	
VisionMamba-Based Multimodal Learning for Alzheimer's Disease and Mild Cognitive Impairment Diagnosis	1205
Sichen Bao, Lifen Jiang, Qiantong Zhang, Qian Gao	
Anything-DT Modeling: A New Framework for Digital Twin Modeling of Wild Objects from a Single RGB Image	1209
Jun Geng, Siqi Wang, Xiaoyun Yi, Wanqing Xiong, Hongchao Yin, Xiaoyu Li	

Detection of Known Signals under Non-Gaussian Noise based on the Laplacian Kernel Yibang Yang, Yuyang Chen, Guanna Huang, Weichao Xu	1215
A Network with Feature Partition and Local Feature Embedded for Vehicle Re-Identification Zhaoxian Mo, Xintao Jiao	1220
The Effects of a Knee-Joint Energy Harvester on Muscle Activation in the Human Lower Limbs Based on EMG Signal Mingze Luo, Guowei Huang, Longhan Xie	1226
Data-Free Knowledge Distillation via Contrastive Inversion and Cluster Alignment Zhaoming Zheng, Zhibin Du	1232
Research on Hierarchical Optimization of Intelligent Connected New Energy Vehicles Based on Dynamic Programming Zhimeng Zhang, Chunhui Liu	1238
Risk quantification based intraday flexibility resource adjustment strategy Yuning Zhang, Jiawen Yang, Yanxin Li, Chunming Liu	1244
Conflict-Based Search for Multi-Robot Path Planning Using Optimal Motion Primitives Yuanhao He, Chao Wei, Botong Zhao, Fuyong Feng	1249
A Hierarchical trajectory planning framework based on 3D spatiotemporal coupling Botong Zhao, Chao Wei, Peng Wang, Fuyong Feng	1255
Research on Bidding and Tendering Risk Warning Algorithms Based on Knowledge Graph Technology Zhiwei Wu, Kai Wang, Shengcang Ge, Nannan Jiang, Chao Sun	1261
A Survey of Talking-Head Generation Technology and Its Applications Han Li, Lin Zhang, Xishan Zou, Jinyi Lin, Xiang Li, Yan Li, Xinyu Chang, Jieheng Zheng	1266
Improved whale optimization algorithm for VSG control Mingliang Xia, Xihuai Wang	1272
Research on Sharpening Enhancement Techniques for Trace Images Hanxin Zhang	1277
RSS-YOLO: A Feature Fusion and Decoupled Object Detection Method in Remote Sensing Satellite Images Zhengcong Han, Songsong Zhang, Wei Tian, Wenting Li, Ying Wan, Yanyan Lu, Hanhui Li, Zhaonan Mu, Junkai Miao, Shaojie Xiong	1283
Enhanced LiDAR SLAM Backend with Multi-Session Mode for Long-Term Association Qianyi Li, Jian Qiu, Miao Chen, Peng Han, Dongmei Liu, Kaiqing Luo	1290
An Empirical Study on Large Language Models for Aerospace Question Answering Long He, Lai Kang, Mingyang Geng	1295
A Multitask Genetic Programming Approach With A New Individual Representation to Symbolic Regression Jing Liang, Wenjing Li, Yahui Jia, Ying Bi	1301
Hybrid FM-GCN-Attention Model for Personalized Recommendation Erfan Wang	1307

Applications of Physics-Informed Neural Networks in High-Voltage Insulation Engineering: A Review	1311
Xize Dai, Haolun Che, Jian Hao	
Research on Automatic Generation and Reporting of Power Emergency Information Based on Transformer and Joint Attention Mechanism	1315
Caina Chen, Songyuan Zheng, Zhuangling Zhang, Qishen Pan, Yifu Mo, Xianhua Dai	
Enhanced Task Offloading in Mobile Edge Computing: A Hybrid Approach Using Deep Q-learning from Demonstrations and Heuristic Optimization	1321
Huishi Zhao, Yitong Liu, Xingcheng Liu, Yi Xie, Peiran Wu	
A U-Net-Based Approach for Fundus Retinal Image Segmentation	1325
Shimin Feng, Xinye Zhou, Weiyi Xie, Zishan Li, Xuanzhi Peng, Xinran Yu	
Graph Convolutional Sentiment Analysis Model Integrating Knowledge and Position Enhancement	1330
Yihua Zhang, Qiang Li, Bowen He, Yongfu Zhang	
Towards Reliable Navigation for Intelligent Unmanned Surface Vehicles	1335
Wenwen Liu, Zhuoli Zhao, Yujian Ye, Dezhi Xu	
Research on sequence sampling method based on surrogate model	1342
Shouyue Dang, Qianpeng Han, Xiangyu Sun, Huimin Yu, Xiaoling Li	
Improved Differential Steering Control Algorithm for Intelligent Vehicles	1347
Weijian Ye, Xiaoshun Wang, Yiming Gao	
Power detection image recognition analysis based on image fusion extended training	1351
Yingying Dong, Suping Guo, Sijing Dai, Zongliang Yang	
Research on Intelligent Perception Visualization of Concrete Vibrating Based on Ultrasonic Technology	1356
Haoran Zheng, Xuejun Jia, Weijun Su, Xiaoxiao Wang, Xiang Lv, Guangming Zhang	
Multiple Regression Methods based Core Rod Localization for Composite Insulators Images	1361
Zhihao Zheng, Chengcheng Rao, Junsheng Lin, Chao Yuan	
Research on Student Behavior Recognition Based on Improved YOLOV8	1366
Linqing Ma, Jun Chen, Shaoxing Bai, Jianji Lian	
Smooth Particle Swarm Fluid Simulation Algorithm Based on Graph Neural Network	1371
Yixuan He, Huifu Luo	
Adaptive Embedding Using Contrastive Learning with Median Absolute Deviation and Variance for Recommendation	1376
Qinxin Xu, Haofeng Li, Wei Zhou, Zhiyong Yang	
Transmission line meteorological risk data automatic generation and auxiliary label method	1381
Ziya Xing, Xiaofeng Gao, Yuqing Wang, Yun Li	
A Novel Received Signal Strength Estimation Method for Wi-Fi Fingerprint-based Indoor Positioning	1386
Botao Liu	

Research on UV Imaging Detection of Corona Discharge on Power Fittings Qingzhou Zhao, Weiguo Jiang, Jianing Tan, Mingyu Ai, Longxin Yue	1391
Research on Deep Learning-based Compression Processing Technology for UAV Inspection Images Aiguo Teng, Junjie Zha, Xinwen Shan, Jiajia Zhu, Jiaxin Lu	1395
Enhancing Cross-Domain Access Efficiency in Zero-Trust Scenarios Oriented to the Access Process Xian Li, Shijun Zhang, Jing Zeng, Shuo Li, Ruxia Yang	1400
Improved Path Tracking Optimization Method for Intelligent Vehicles Using Standard Wide-Angle Lenses Yiming Gao, Xiaoshun Wang, Weijian Ye	1406
Advanced Signal Processing and Machine Learning for Water Pump Fault Diagnosis Xiangyu Sun, Qianpeng Han, Shouyue Dang, Huimin Yu, Xiaoling Li	1411
Research on multi-vehicle trajectory planning based on Improved RRT-APF method Hao Zhang, Fuyong Feng, Chao Wei, Botong Zhao	1416
Deep Semantic Graph Learning via Large Language Models-based Node Enhancement Chuanqi Shi, Yiyi Tao, Hang Zhang, Lun Wang, Shaoshuai Du, Yixian Shen, Yanxin Shen	1421
Application and Validation of Beidou-3 Satellite Technology in the Field of UAV Inspection Yuxiang Zhang, Kang Wang, Yongjie Qing, Yang Weng	1425
Applying Text and Image Mining Techniques for Identifying Future Signals of AI-Powered Products Hao Wang, Bo Yang, Jianfei Qin	1430
LEUSIM: A Lightweight Extendable User SIMulator for Testing Commercial Task-Oriented Dialogue System Xiaoqian Li, Wenbo Guan, Lingyu Liang, Huanming Zhang	1434
A Time Space Feature Extraction Method for Scene Analysis Based on Spectral Clustering Theory Wangchao Dong, Jingjing Wang, Xu Wu, Xun Mao, Kai Lv	1440
A Novel Non-Intrusive Load Decomposition Approach Based on TCN with RFAM Method Zhengtao Wu, Yanghong Xia, Zichen Li	1446
Diff-OD: Object Detection with Text-to-Image Diffusion Models Baolin Chen, Tianyu Li	1452
Research on Distributed Management and Early Warning Technology of Food Science Laboratory Based on Multi information Fusion Yao Tong, Hong Wang, Gaoxing Ma	1457
Author Index	