

2025 International Conference on Automation, Electrical Control Systems and Equipment (AECSE 2025)

**Nanjing, China
27-29 November 2025**

IEEE Catalog Number: CFP257AP-POD
ISBN: 979-8-3315-7818-3



Copyright © 2025, IEEE

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:	CFP257AP-POD
ISBN (Print-On-Demand):	979-8-3315-7818-3
ISBN (Online):	979-8-3315-7817-6

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

TABLE OF CONTENTS

Study on the Design of Multi-Motor Coordinated Control for Industrial Electric Drive Systems	1
<i>Yunfeng Tao, Mingna Ma</i>	
Non-Singular Fast Terminal Sliding Mode Control for PMSM Based on Sliding Mode Disturbance Observer	5
<i>Yixuan Luo, Bin Zhang</i>	
Research on Low-Carbon Economic Operation of Integrated Energy Systems in Coal Mines Based on Associated Energy Utilization and CCS-P2G Combined Operation	10
<i>Wei Wei, Fengyuan Lv, Qiming Wei, Zhandong Jiang, Jun He, Xijin Yan, Longyue Yang</i>	
Intraday Rolling Optimization Scheduling Model for Power Systems Considering Operational Reliability Constraints	15
<i>Zhihong Liu, Yunting Song, Bo Hu, Qian Wang, Shiji Wang, Zihao Wu, Zhenhua Liu</i>	
Application of Coordinated Optimization Technology for New Energy Station-Level Control Systems Under Power Grid Faults	20
<i>Jiehong Xu, Xuelei Fang, Chuan Yu, Jie Huang, Ning Zhang, Yue Sun, Heming Zhang, Xiaowan Song</i>	
An Intelligent PID Controller with Neural Network Learning for Valve Stiction Compensation	26
<i>Dong Yang, Silin Yang, Huai Wang, Chunhong Li, Shouqi Fu, Shumei Li, Sicheng Xiao, Zhifan Duan</i>	
Research on Scheduling Optimization of New Energy Virtual Power Plants Integrated with Deep Reinforcement Learning and Grey Wolf Optimizer	31
<i>Jing Xu, Sheng Huang, Xiangwei Meng, Wenshuai Wang, Guangchen Li, Yujie Song, Zikang Wei Changxin Song, Weiqiang Lu</i>	
Trajectory Control of a 4WIDS Mining Vehicle	36
<i>Xigetu He, Junqing Feng, Shudong Liu, Chuang Wang</i>	
Rapid-Response Control Algorithm for Embedded Solar Tracking Systems	41
<i>Zhiqiang Ding, Yanlin Yao, Shiyan Gao, Yongqiang Ding, Xiaoming Liu, Jifeng Ren, Jing Dong Jihong Song</i>	
Optimized English Thesis Outline: An Unmarked Vision-Based Upper-Limb Rehabilitation Interactive System with Multimodal Feedback and Experimental Study	45
<i>Xin Fan, Genglie Zhou, Liwen Fan, Haolin Meng</i>	
Online Distributed Meta Learning for Solving Multiple Microgrids Economic Dispatch Problems	50
<i>Chenglong Wang, Kaihong Lu, Yanfu Qin</i>	
Generalized Fixed-Time Stability of Stochastic Nonlinear Systems Using Finite Time-Varying Gain	56
<i>Shang Shi, Xinjian Guo</i>	
Optimized Dispatch Strategies of Electrolyzer Cluster and Battery Considering Renewable Power Fluctuation	60
<i>Shaohua Dong, Yi Zheng, Ziyue Wang, Xin Zhao, Dingzhang Guo</i>	
Automatic Code Generation and Experimental Validation for DSP-BLDC Motor Based on MBD	68
<i>Tongyuan Zhang, Jingyi Tian, Boru Jia, Ye Yang</i>	

Modeling and Analysis of Integrated Flight-Propulsion for Distributed Electric Propulsion Aircraft	72
<i>Ziyang Zheng, Biao Wang, Chaoying Tang, Wei Chen</i>	
A Multi-Coil Rotary Wireless Power Transfer Solution for Monitoring Devices on Industrial Rotating Shafts	78
<i>Yonghao Sun, Xuling Chen, Fan Zhang, Wei Peng</i>	
A Novel Frustum-Shaped Multi-Load WPT Platform Based on the Distribution Characteristics of Magnetic Field	83
<i>Fan Zhang, Xuling Chen, Yonghao Sun, Wei Peng</i>	
Analysis on Electromagnetic Compatibility of Vehicle Ethernet Chip	88
<i>Jie Zhang, Junjie Ma, Xuan Feng, Yueyan Zhu</i>	
Efficiency Optimization Study of Multi-Resonant Converter for Hydrogen Production Power Supply Based on Third Harmonic Injection	94
<i>Xiaohe Wang, Yabo Lv, Jia Tian, Xiaofei Chang, Gui Yin, Hongyu Wang, Xijin Yan</i>	
An Automated Testing System for Reconfigurable Processing Payloads of Communication Satellites	99
<i>Ming Li, Lingxuan Yang, Guoshuai Hou, Zhongyue Liu, Wei Liu, Ming Ouyang</i>	
Research on Photovoltaic-Energy Storage Coordinated Multi-port PECM-RPC Topology and Control	104
<i>Lu Geng, Yiyue Xu, Lele Fang, Xinyue Liu</i>	
DC/DC Converter Circuit with BP Neural Network PID Control Optimized by Genetic Algorithm	108
<i>Xiran Liu, Xiaorong Huang, Yiqiang Peng</i>	
Study on the Influence of the Energy Recovery Circuit on the Performance of the Reluctance Launcher	112
<i>Pinghui Li, Wanting Xi, Na Wu, Qihang Wu</i>	
Thermal Management Technology of High-Power Shaft-Mounted Generators	119
<i>Yongjian Zhou, Sifei Meng, Chong Lou, Feifei Bu</i>	
Topology Design and Control Technology for Grid Impedance Measurement Equipment	123
<i>Yuntao Xiao, Zixuan Guo, Junhua Ma, Caiyun Gao</i>	
End-Fed Antenna for Emergency Communications Applications in Northwest Complex Terrain: EZNEC-Based Emergency Communication Application	129
<i>Jiaying Yang, Zhenli Zhang, Xia Yan</i>	
Development and Performance Optimization of 4G Signal Enhancement Device and Signal Transmission System for Box-Type Substations	134
<i>Lei Zhou, Liang Zhu, Jing Shao, Ziyuan Zhou, Li Wei, Puqing Liu, Kaidi Shi, Han Bao</i>	
A Harmonic Energy Metering Algorithm Based on Four-Term Five-Order Nuttall Window and Three-Spectrum Interpolation FFT	138
<i>Yingying Cheng, Yu Su, Gaolin Wu, Wenli Chen, Xingzhi Liu, Minghui Ma, Ji Xiao</i>	
Fault Diagnosis of DC Charging Piles Based on Deep Neural Networks	143
<i>Zhuoqun Li, Zhen Chen, Xiangyu Zhang, Liyong Wang, Xiaoxi Yuan, Zhou Sun</i>	
Research on Very Low Frequency (VLF) Dielectric Loss Characteristics of Distribution Medium-Voltage Network Cables and Their Accessories under Constant-Voltage Load Cycling Degradation	148
<i>Hongliang Chang, Zhihao Fan, Zihang Zhang, Shusheng Song, Ran Hu</i>	

Research on the Energy Storage Measurement and Control System for Distribution Transformer Areas Based on the Distribution Internet of Things and Its Cloud-Edge Collaborative Optimization Design	154
<i>Jingtao Xu, Shengjie Zhou, Tao Tan, Zhongbin Zhu</i>	
Analysis of Lightning Strike Fault of Wind Turbine in a Wind Farm in Northeast China	164
<i>Huaxiang Wang, Keyan Sheng, Tiankuo Wang, Yujia Chen</i>	
Severity Assessment of Gas-Insulated Switchgear/Gas-Insulated Transmission Lines Partial Discharge Based on Adaptive Clustering	168
<i>Shu Niu, Sheng Liu, Zhigang Xue, Zhumao Lu, Na Wu, Hong Liu, Xianhao Fan</i>	
Research on Intelligent Identification and Diagnosis Technology of Mechanical Faults of High-voltage Circuit Breakers	172
<i>Shuang Li, Haitao Bi, Shuai Wang, Jiaqi Li</i>	
Intelligent Pedestrian Intrusion Early Warning System Based on YOLOv8 and DeepSort	176
<i>Zhaoxian Xu, Zhibo Dai, Buyuan Zhang, Lei Wang, Guangyuan Zhang, Yixuan Liang</i>	
Study on the Influence of Vanishing Moment Order on Impulse Disturbance Feature Extraction	180
<i>Jing Gong</i>	
Research on Intelligent Auditing and Behavior Tracking Mechanism for Power Data Based on Graphical Scene Modeling	185
<i>Yue Chen, Ye Liu, Yingwei Liang, Yufei Yang</i>	
Scenario Generation of Wind and PV Power Based on Improved WGAN-GP	190
<i>Xiaoyang Li, Dong Yang, Yongji Cao, Hao Wang, Chuanan Zhang, Baoliang Li, Pingping Chen Zhihua Jiang, Guocheng Gu</i>	
Analysis of Operational Characteristics of Evaporative Cooling Systems for Offshore Wind	195
<i>Wenxin Wei</i>	
Visual Inspection-Based Method for Calculating Atomisation Spray Angle	200
<i>Huacheng Guo, Mi Sun, Zunhua Gao, Mingqi Gao, Changyong Yang, Weimin Song</i>	
Real-Time Posture and Force Monitoring of Transmission Tower Lifting via Bayesian Multi-Sensor Fusion	204
<i>Luojia Zhang, Ran Hu, Hai Lu, Zebin He, Luping Shan, Zhihao Zheng, Xing Huang, Zijie Zheng</i>	
Research on Wavereversing Transformer Winding Fault Diagnosis Based on Lissajous Figures and SVM	212
<i>Jian Wang, Puzhi Zhao, Xiao Sun, Dingqian Yang, Jianping Zhao</i>	
Real-Time Surface Defect Detection for Electrical Equipment Based on Lightweight Yolov5	217
<i>Xueni He, Hao Chen</i>	
Assessment of Power Supply Capacity of Distribution Network Based on Improved Continuation Power Flow	223
<i>Xueyin Li, Haodong Ren, Guangru Zhang, Zhenqi Ma, Binyu Liu, Liang Zhu</i>	
Research on the Melting Mechanism and Prevention Measures of PT High Voltage Fuses in 10~35KV Distribution Networks	230
<i>Fanggang Xu, Mingyu Jing, Jingjing Du, Rui Li, Bo Sun, Xianguang Che, Ejuan Zhou, Wei Liu, Xianpeng Li</i>	

Multi-Scenario Risk Situation Assessment Method for Distribution Networks With High-Penetration Renewable Resources	238
<i>Haiquan Huang, Jingjing Bai, Junjie Shao, Min Wei</i>	
Real Vehicle Dynamic Information Based Tire Blowout Detection	244
<i>Guoxiang Lu, Yifa Liu, Xiaofen Yan</i>	