2021 International Conference on **Information Control, Electrical Engineering and Rail Transit (ICEERT 2021)**

Virtual Conference 30 October – 1 November 2021



IEEE Catalog Number: CFP21BC0-POD ISBN:

978-1-6654-3818-6

Copyright © 2021 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:
 CFP21BC0-POD

 ISBN (Print-On-Demand):
 978-1-6654-3818-6

 ISBN (Online):
 978-1-6654-3817-9

Additional Copies of This Publication Are Available From:

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

Fax: (845) 758-2633

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



2021 International Conference on Information Control, Electrical Engineering and Rail Transit (ICEERT) ICEERT 2021

Table of Contents

Preface Committee Members Reviewers	xv
Big Data Information Control and Smart Grid Application	
Simulation Method for Multiperiod Panoramic Operation of New Energy Power System in Complex Environment Xin Zhang (Economic & Technical Research Institute of SEPC of SGCC, China)	1
Application of Micro Power Wireless Temperature Sensor in Condition Monitoring of Power Transmission and Transformation Equipment	5
A Study on Optimization of SMT MachineBased on Ant Colony Algorithm	9
Research on Gata Clamp Active Clamp Circuit Based on SiC MOSFET Drive Yi Hao (Global Energy Interconnection Research Institute Co., Ltd., China), QingPing Li (Global Energy Interconnection Research Institute Co., Ltd., China), YunFei Xu (Global Energy Interconnection Research Institute Co., Ltd., China), and WeiGuo Li (Global Energy Interconnection Research Institute Co., Ltd., China)	14
Research on the Individualization of Human-Computer Interaction Through Socially Sensitive Learning	
Research on the Real-Time Performance of CAN Bus Based on 4WID New Energy Bus Networ	k 24

Fault Early Warning Model of Power Metering Automatic Verification Assembly Line Based on Residual Neural Network	29
Xiaoze Liu (State Grid Liaoning Marketing Servide Center, China), Jiarui Sui (State Grid Liaoning Marketing Servide Center, China), Jianbo Zhao (State Grid Liaoning Marketing Servide Center, China), Chao An (State Grid Liaoning Marketing Servide Center, China), and Yanjiao Cai (State Grid Liaoning Marketing Servide Center, China)	
Edge Computing in Smart Hydropower Station: Noise Suppression for Condition Monitoring Yuanlin Luo (Power China Huadong Engineering Corporation Limited, China; Zhejiang University, China), Minhua Chen (Power China Huadong Engineering Corporation Limited, China; Zhejiang University, China), Yuechao Wu (Power China Huadong Engineering Corporation Limited, China), and Bo Zheng (Power China Huadong Engineering Corporation Limited, China)	.33
Research On Risk Assessment Of UAV To Buildings	. 37
On Line Monitoring Method of Operation Environment Safety for Substation Maintenance	. 41
Optimizing Stencil Codes with Exploiting Data Reuse Xu Chang (National University of Defense Technology, China), Li Shen (National University of Defense Technology, China), and Qiong Wang (National University of Defense Technology, China)	. 45
Study on the Characteristics of Hybrid Ionized Field Under Different Transmission Line Structures	55
Hybrid Energy Storage Power Allocation Based on Moving Average Filtering and VMD	. 60

Line Defect Image Aided Recognition Method for Power Communication Operation Inspection 60 Zhiping Wei (ChongZuo Power Supply Bureau of Guangxi Power Grid Co., Ltd., China), Guanghui Su (ChongZuo Power Supply Bureau of Guangxi Power Grid Co., Ltd., China), Zhijun Chen (ChongZuo Power Supply Bureau of Guangxi Power Grid Co., Ltd., China), Xueyan Li (ChongZuo Power Supply Bureau of Guangxi Power Grid Co., Ltd., China), Xiuhao Fang (ChongZuo Power Supply Bureau of Guangxi Power Grid Co., Ltd., China), and Zhangfeng Deng (ChongZuo Power Supply Bureau of Guangxi Power Grid Co., Ltd., China)	,
Research on UAV Conflict Resolution Based on Dynamic Conflict Detection Model)
Research on Transfer Metering Technology of Water Bearing Crude oil	,
Anti-Heat-Interference Test of Thermal Imaging Video Fire Detector	,
Comprehensive Energy Efficiency Rating Evaluation Model of Enterprise Power Based on Grid Big Data	3
Reliability Analysis of Decentralized Autonomous Dispatching Centralized Station Subsystem Based on Fault Tree	7
Design and Effect Analysis of Wireless Energy Transmission Device for Electric Vehicle	L

Voiceprint Intelligent Recognition	95
Shimulin Xie (State Grid Info-Telecom Great Power Science And Technology Co., Ltd, China), Xiao Liao (State Grid Information and Communication Group Co., Ltd, China), Xiang Zhang (State Grid Info-Telecom Great Power Science And Technology Co., Ltd, China), Xingtao Wang (State Grid Information and Communication Group Co., Ltd, China), Min Jin (State Grid Information and Communication Group Co., Ltd, China), Xujie Liu (State Grid Info-Telecom Great Power Science And Technology Co., Ltd, China), and Zeyi Tang (State Grid Info-Telecom Great Power Science And Technology Co., Ltd, China)	30
Dynamic Path Planning for AGV Based on Tent Chaotic Sparrow Search Algorithm	100
Intelligent Video Surveillance Method for Digital Substation Based on Background Difference Fuhong Chang (State Grid Xuchang Electric Power Supply Company, China), Qi Li (State Grid Xuchang Electric Power Supply Company, China), Yuanyuan Wang (State Grid Xuchang Electric Power Supply Company, China), and Wenfeng Zhang (State Grid Xuchang Electric Power Supply Company, China)	105
Research on Insulator Detection Method Based on Scene Recognition Zhimin Li (Chongqing University, China), Fan Yang (Chongqing University, China), Tian Tan (Chongqing University, China), Xu Lu (Shenzhen Power Supply Bureau Co., Ltd., China), and Jie Tian (Shenzhen Power Supply Bureau Co., Ltd., China)	109
Research on Infrared Image Segmentation Technology of Transmission Equipment Based on Local area Medoidshift Clustering Algorithm	114
Research on Deep Control Simulation of Small UUV Based on Pan-Boolean PID	119
Research on Intelligent Transformer Differential Protection System Based on "Plug and Play"	123

Yan Gao (State Grid Chongaing Electric Power Company Jiangjin Power Supply Branch, China), Aijum Zou (State Grid Chongaing Electric Power Company Jiangjin Power Supply Branch, China), Jie Mu (State Grid Chongaing Electric Power Company Marketing Service Center, China), Ruolin Tao (State Grid Chongaing Electric Power Company Jiangjin Power Supply Branch, China), Xiaobo Wu (State Grid Chongaing Electric Power Company Jiangjin Power Supply Branch, China), Xixiang Xie (State Grid Chongaing Electric Power Company Jiangjin Power Supply Branch, China), Hao Wang (State Grid Chongaing Electric Power Company Jiangjin Power Supply Branch, China), and Yue Zhang (State Grid Chongaing Electric Power Company Jiangjin Power Supply Branch, China) Hao Wang (State Grid Chongaing Electric Power Company Jiangjin Power Supply Branch, China), and Yue Zhang (State Grid Chongaing Electric Power Company Jiangjin Power Supply Branch, China) Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead Transmission Line Based on MEMS Technology Ke Zhou (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiaoming Wang (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiangyu Lin (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Hongdi Sun (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China) Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid Jian Huang (Yunnan Power Grid Limited Liability Company, China), Peng He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), Mang (Yunnan Power Grid Corrosion Detection Device Based on the Electrical Network Method Dissipation of Grounding Grid	Analysis of Influence of Natural gas Modeling on the Optimization of Electric-gas	
Supply Branch, China), Ajjun Zou (State Grid Chongqing Electric Power Company liangjin Power Supply Branch, China), Jie Mu (State Grid Chongqing Electric Power Company Marketing Service Center, China), Ruolin Tao (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), Xiaobo Wu (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), Xixiang Xie (State Grid Chongqing Electric Power Company) Jiangjin Power Supply Branch, China), Hao Wang (State Grid Chongqing Electric Power Company) Jiangjin Power Supply Branch, China), and Yue Zhang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China) Hao Wang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China) Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead Transmission Line Based on MEMS Technology Ke Zhou (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiaoming Wang (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiangyu Lin (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Hongdi Sun (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China), and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China) Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid . 144 Jian Huang (Yuman Power Grid Limited Liability Company, China), Hong Feng (Yuman Power Grid Limited Liability Company, China), Jeng Feng (Yuman Power Grid Limited Liability Company, China), Mang (Yuman Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method Qingming Duan (Jilin University, China), Shanshan Li (Jilin University, China), Xiaofeng Y	Integrated System	. 130
Company Jiangjin Power Supply Branch, China), Jie Mu (State Grid Chongqing Electric Power Company Marketing Service Center, China), Ruolin Tao (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), Xiaobo Wu (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), Xixiang Xie (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), and Yue Zhang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), Hao Wang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), and Yue Zhang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China) Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead Transmission Line Based on MEMS Technology Ke Zhou (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiaoming Wang (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiangyu Lin (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Hongdi Sun (China Southern Power Grid Digital Power Grid Digital Power Grid Research Institute Co., Ltd., China), Ziangyu Lin (Lid., China), and Zhong Liu China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China) Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid 144 Jian Huang (Yuman Power Grid Limited Liability Company, China), Peng He (Yuman Power Grid Limited Liability Company, China), Peng He (Yuman Power Grid Limited Liability Company, China), Jeng Yuman Power Grid Limited Liability Company, China), and LiWei Yuan (Yuman Power Grid Limited Liability Company, China), Alla Wang (Yuman Power Grid Limited Liability Company, China), Alla Wang (Yuman Power Grid Limited Liability Company, China), Alla Wang (Yuman Power Grid Limited Liability Company, China), Alla Wang (Yuman Power Grid Limited Liability Company, China), Alla LiWei Yuan (Yuman Power Grid Limited Liability Company, Chi		
Chongqing Electric Power Company Marketing Service Center, China), Ruolin Tao (State Grid Chongqing Electric Power Company) Jiangjin Power Supply Branch, China), Xiaobo Wu (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), Xixang Xie (State Grid Chongqing Electric Power Company) Jiangjin Power Supply Branch, China), Ilao Wang (State Grid Chongqing Electric Power Company) Jiangjin Power Supply Branch, China), and Yue Zhang (State Grid Chongqing Electric Power Company) Jiangjin Power Supply Branch, China) Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead Transmission Line Based on MEMS Technology		
Ruolin Tao (State Grid Chongajng Electric Power Company Jiangjin Power Supply Branch, China), Xiaobo Wu (State Grid Chongajng Electric Power Company Jiangjin Power Supply Branch, China), Xixiang Xie (State Grid Chongajng Electric Power Company Jiangjin Power Supply Branch, China), Hao Wang (State Grid Chongajng Electric Power Company Jiangjin Power Supply Branch, China), and Yue Zhang (State Grid Chongajng Electric Power Supply Branch, China), and Yue Zhang (State Grid Chongajng Electric Power Company Jiangjin Power Supply Branch, China) Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead Transmission Line Based on MEMS Technology	, , , , , , , , , , , , , , , , , , , ,	
Supply Branch, China), Xiaobo Wu (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), Xixiang Xie (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), Hao Wang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), and Yue Zhang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China) Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead Transmission Line Based on MEMS Technology 138 Ke Zhou (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiaoming Wang (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiaoming Wang (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Hongdi Sun (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China), and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China), China Southern Power Grid Limited Liability Company, China), Peng Ile (Yunnan Power Grid Limited Liability Company, China), Peng Ile (Yunnan Power Grid Limited Liability Company, China), China, Geng Feng (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Corrosion Detection Device Based on the Electrical Network Method (Yunnan Power Grid Corrosion Detection Device Based on the Electrical Network Method (Changxin Power Grid Co., China), Xiaoming Wang (Electric Power Research Institute of Guangxi Power Grid Co., China), Manglia Chang (Jilin University, China), Shanshan Li (Jilin University, China), Shanshan Li (Jilin Liniversity China), Shansha		
Company Jiangjin Power Supply Branch, China), Xixiang Xie (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), Hao Wang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), and Yue Zhang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China) Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead Transmission Line Based on MEMS Technology	0, 0	
Chongqing Electric Power Company Jiangjin Power Supply Branch, China), Hao Wang (State Grid Chongqing Electric Power Company) Jiangjin Power Supply Branch, China), and Yue Zhang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China) Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead Transmission Line Based on MEMS Technology. Ke Zhou (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiaoming Wang (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiangyu Lin (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Aliangyu Lin (Electric Power Research Institute of, Ltd., China), Siangyu Lin (Electric Power Research Institute O., Ltd., China) (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China), and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China) Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid . 144 Jian Huang (Yunnan Power Grid Limited Liability Company, China), Peng He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), And LiWei Yuan (Yunnan Power Grid Limited Liability Company, China), And LiWei Yuan (Yunnan Power Grid Limited Liability Company, China), And Hailan Song (Changchun Polytechnic, China) An Instantaneous Frequency Identification Algorithm for the Dynamic Frequency Signals in Power System John Changchun Polytechnic, China) An Instantaneous Frequency Identification Algorithm for the Dynamic Frequency Signals in Power Grid Co., China), Xiaofeng Yi (Jilin University, China), Sun (Electric Power Research Institute of Guangxi Power Grid Co., China), Mang (Electric Power Research Institute of Guangxi Power Grid Co., China), Mang (Electric Power Research Institute of Guangxi Power Grid Co., China), Siangin Power Grid Co., China),	7, 0	
Hao Wang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China), and Yue Zhang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China) Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead Transmission Line Based on MEMS Technology 138 Ke Zhou (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiaomign Wang (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiaomign Wang (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Hongdi Sun (China Southern Power Grid Digital Power Grid Research Institute of Guangxi Power Grid Digital Power Grid Digital Power Grid Digital Power Grid Research Institute Co., Ltd., China), and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China), and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China) Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid . 144 Jian Huang (Yunnan Power Grid Limited Liability Company, China), Peng He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), And LiWei Yuan (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method	1 0 0 11 0	
Supply Branch, China), and Yue Zhang (State Grid Chongqing Electric Power Company Jiangjin Power Supply Branch, China) Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead Transmission Line Based on MEMS Technology	, , , , , , , , , , , , , , , , , , , ,	
Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead Transmission Line Based on MEMS Technology	, , ,	
Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead Transmission Line Based on MEMS Technology		
Transmission Line Based on MEMS Technology	Power Company Jiangjin Power Supply Branch, China)	
Transmission Line Based on MEMS Technology	Simulation of Electromagnetic Field Distribution and Coupling Effect of Overhead	
Ke Zhou (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiaoming Wang (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiangyu Lin (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Hongdi Sun (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China), and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China) Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid . 144 Jian Huang (Yunnan Power Grid Limited Liability Company, China), Peng He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method	1 0	138
Ltd., China), Xiaoming Wang (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Xiangyu Lin (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Hongdi Sun (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China), and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China), and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China) Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid . 144 Jian Huang (Yunnan Power Grid Limited Liability Company, China), Peng He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method		
Guangxi Power Grid Čo., Ltd., China), Xiangyu Lin (Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China), Hongdi Sun (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China), and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China) and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China) Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid . 144 Jian Huang (Yunnan Power Grid Limited Liability Company, China), Peng He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method	, ,	
Research Institute of Guangxi Power Grid Co., Ltd., China), Hongdi Sun (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China), and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China) Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid . 144 Jian Huang (Yunnan Power Grid Limited Liability Company, China), Peng He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method	č č	
(China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China), and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China) Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid . 144 Jian Huang (Yunnan Power Grid Limited Liability Company, China), Peng He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) and LiWei Yuan (Yunnan Power Grid Corrosion Detection Device Based on the Electrical Network Method	6	
Ltd., China), and Zhong Liu (China Southern Power Grid Digital Power Grid Research Institute Co., Ltd., China) Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid . 144 Jian Huang (Yunnan Power Grid Limited Liability Company, China), Peng He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method		
Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid . 144 Jian Huang (Yunnan Power Grid Limited Liability Company, China), Peng He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method		
Reverse Short Distance Measurement Method of Grounding Resistance of Large Grounding Grid . 144 Jian Huang (Yunnan Power Grid Limited Liability Company, China), Peng He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method		
Jian Huang (Yunnan Power Grid Limited Liability Company, China), Peng He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method	Payarea Shart Distance Massurament Method of Crounding Pasistance of Large Crounding Crid	111
He (Yunnan Power Grid Limited Liability Company, China), Cheng Feng (Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method		. 144
(Yunnan Power Grid Limited Liability Company, China), ZiHao Wang (Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method		
(Yunnan Power Grid Limited Liability Company, China), and LiWei Yuan (Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method		
(Yunnan Power Grid Limited Liability Company, China) Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method		
Design of a Grounding Grid Corrosion Detection Device Based on the Electrical Network Method	Ç , Ç	
Method		
Qingming Duan (Jilin University, China), Shanshan Li (Jilin University, China), Xiaofeng Yi (Jilin University, China), and Hailan Song (Changchun Polytechnic, China) An Instantaneous Frequency Identification Algorithm for the Dynamic Frequency Signals in Power System		
University, China), Xiaofeng Yi (Jilin University, China), and Hailan Song (Changchun Polytechnic, China) An Instantaneous Frequency Identification Algorithm for the Dynamic Frequency Signals in Power System		148
An Instantaneous Frequency Identification Algorithm for the Dynamic Frequency Signals in Power System		
An Instantaneous Frequency Identification Algorithm for the Dynamic Frequency Signals in Power System		
Power System	Song (Changchun Polytechnic, China)	
Power System	An Instantaneous Frequency Identification Algorithm for the Dynamic Frequency Signals in	
Xuanren Meng (Electric Power Research Institute of Guangxi Power Grid Co., China), Mosi Liu (Electric Power Research Institute of Guangxi Power Grid Co., China), Xiaoming Wang (Electric Power Research Institute of Guangxi Power Grid Co., China), and Zhiyuan Sun (Electric Power Research Institute of Guangxi Power Grid Co., China) Research on Dynamic Pricing Strategy of Electricity Retailers Considering Renewable Energy Quota System		158
Co., China), Mosi Liu (Electric Power Research Institute of Guangxi Power Grid Co., China), Xiaoming Wang (Electric Power Research Institute of Guangxi Power Grid Co., China), and Zhiyuan Sun (Electric Power Research Institute of Guangxi Power Grid Co., China) Research on Dynamic Pricing Strategy of Electricity Retailers Considering Renewable Energy Quota System		
Power Grid Co., China), Xiaoming Wang (Electric Power Research Institute of Guangxi Power Grid Co., China), and Zhiyuan Sun (Electric Power Research Institute of Guangxi Power Grid Co., China) Research on Dynamic Pricing Strategy of Electricity Retailers Considering Renewable Energy Quota System	, ,	
Institute of Guangxi Power Grid Co., China), and Zhiyuan Sun (Electric Power Research Institute of Guangxi Power Grid Co., China) Research on Dynamic Pricing Strategy of Electricity Retailers Considering Renewable Energy Quota System	, ,	
Power Research Institute of Guangxi Power Grid Co., China) Research on Dynamic Pricing Strategy of Electricity Retailers Considering Renewable Energy Quota System		
Research on Dynamic Pricing Strategy of Electricity Retailers Considering Renewable Energy Quota System		
Quota System		
Zhonghua Xie (Jiangxi Electric Power Trading Centre Co., LTD, China), Gang Chen (Jiangxi Electric Power Trading Centre Co., LTD, China), Min Liu (Jiangxi Electric Power Trading Centre Co., LTD, China), Yunhe Zhong (Nanchang University, China), Zijing Zhang (South China University of Technology, China), Dunnan Liu (North China Electric Power University, China), Zhixin Dong (North China Electric Power University, China), and Hua Li (North China Electric Power University,		166
Gang Chen (Jiangxi Electric Power Trading Centre Co., LTD, China), Min Liu (Jiangxi Electric Power Trading Centre Co., LTD, China), Yunhe Zhong (Nanchang University, China), Zijing Zhang (South China University of Technology, China), Dunnan Liu (North China Electric Power University, China), Zhixin Dong (North China Electric Power University, China), and Hua Li (North China Electric Power University,		. 100
Liu (Jiangxi Electric Power Trading Centre Co., LTD, China), Yunhe Zhong (Nanchang University, China), Zijing Zhang (South China University of Technology, China), Dunnan Liu (North China Electric Power University, China), Zhixin Dong (North China Electric Power University, China), and Hua Li (North China Electric Power University,		
Zhong (Nanchang University, China), Zijing Zhang (South China University of Technology, China), Dunnan Liu (North China Electric Power University, China), Zhixin Dong (North China Electric Power University, China), and Hua Li (North China Electric Power University,		
University of Technology, China), Dunnan Liu (North China Electric Power University, China), Zhixin Dong (North China Electric Power University, China), and Hua Li (North China Electric Power University,		
Power University, China), Zhixin Dong (North China Electric Power University, China), and Hua Li (North China Electric Power University,		
University, China), and Hua Li (North China Electric Power University,		
· ·	· ·	
	China)	

Intelligent Rail Transit and Road Signal Control

On Compaction Construction Technology of Subgrade and Pavement in Highway Engineering Weidong Li (Haiwei Engineering Construction Co., Ltd.)	172
Pose Estimation of Building Fire-Fighting Facilities using Structural Constraint Measurement System Chen Zhong (Shenyang Fire Science and Technology Research Institute of MEM, China), Hao Qiu (Harbin Institute of Technology, China), Yu Chen (Neusoft HiFly Medical Technology Co., Ltd, China), and Qiang Yang (Northeastern University, China)	176
Automated Driving Transmission Model of Mixed Traffic flow and Simulation	180
Research on Fault Diagnosis of Tuning Area of Jointless Track Circuit Based on PSO-SVM	185
Research on Price Adjustment Strategy of General Speed Railway Based on Price Elasticity of Demand	191
Research on Highway Environmental Protection System and Carbon Footprint Based on Full Process Management Theory Xin Zhou (Jiangsu Provincial Transportation Engineering Construction Bureau, China), Cheng Du (Jiangsu Middle Road Engineering Technology Research Institute Co., Ltd., China), Yousen Yang (Jiangsu Middle Road Engineering Technology Research Institute Co., Ltd., China), Zhun Ming (Jiangsu Middle Road Engineering Technology Research Institute Co., Ltd., China), Xi Hai (Jiangsu Middle Road Engineering Technology Research Institute Co., Ltd., China), and Jianwen Gao (Jiangsu Middle Road Engineering Technology Research Institute Co., Ltd., China)	196
Research on the Applicability of Localization of DKZ13 Electric Train Traction System on Beijing Subway Line 5	203
Feature Extraction and Classification of Partial Discharge Signal in GIS Based on Hilbert Transform Lingliang Zhou (Chongqing University, China), Fan Yang (Chongqing University, China), Yuchen Zhang (Chongqing University, China), and Shiying Hou (Chongqing University, China)	208

Study on Construction Safety Risk of Operating Railway Line	. 214
Analysis on the Selection and Maintenance of Shipborne Video Surveillance System	. 224
Study on Dynamic Route Guidance Method of Urban Construction area Under Vehicle-Network Environment Wenhuai Lu (Lanzhou Jiaotong University, China), Yalong Qiu (China	229
Construction Third Engineering Bureau Group Co., Ltd., China), and Fenlan Liu (Lanzhou Jiaotong University, China)	
Field of View and Its Design for the Autonomous Driving System of Tram	. 236
Urban Rail Transit Line and Station Planning Optimization Based on GIS: Take Haikou City as an Example	240
Yang Zhao (Nanjing University of Information Science and Technology, China), Jialu Xu (Nanjing University of Information Science and Technology, China), and Jingqiu Yin (Nanjing University of Information Science and Technology, China)	
Carbon Emission Calculation and Scenario Analysis of Urban Passenger Transport in Nanjing Xin Zhou (Jiangsu Provincial Transportation Engineering Construction Bureau, China), Cheng Du (Jiangsu Middle Road Engineering Technology Research Institute Co., Ltd., China), Yousen Yang (Jiangsu Middle Road Engineering Technology Research Institute Co., Ltd., China), Zhun Ming (Jiangsu Middle Road Engineering Technology Research Institute Co., Ltd., China), Haisheng Liu (Jiangsu Middle Road Engineering Technology Research Institute Co., Ltd., China), and Jianwen Gao (Jiangsu Middle Road Engineering Technology Research Institute Co., Ltd., China)	. 248
Design of a Core Software Development Platform for Railway Vehicles	. 253
Thesis Comparison and Application Research on the Standards of "Fitness-For-Service" of Rail Vehicles	257
Research on Key Technologies of Intelligent Repair of Running Gear of Urban Rail Vehicles Shiming Huang (China Railway Siyuan Survey and Design Institute Group Co., Ltd., China) and Jing Wang (Chengdu Shengkai Co., Ltd., China)	. 267

Analysis of Driving Characteristics of Drivers with Different car Following Styles Aihong Lyu (Xianyang Normal University Vocational and Technical College, China), Zhurang Zhang (Xianyang Normal University Vocational and Technical College, China), Yazhuan Zhao (Xianyang Normal University Vocational and Technical College, China), and Yali Zhang (Chang'an University, China)	276
Research on Intelligent Diagnosis of Railway Turnout Based on FastDTW Under Big Data Monitoring Yuxin Gao (Beijing Jiaotong University, China), Yong Yang (China Academy of Railway Sciences Corporation Limited, China), Yuan Ma (China Academy of Railway Sciences Corporation Limited, China), and Weixiang Xu (Beijing Jiaotong University, China)	2 83
Fault Diagnosis of CBTC On-Board Equipment Based on Improved GA-BP	287
Determining Feasible Region of Tie-Line Transmission Considering Converter Station Xuan Fan (State Grid Chongqing Economic Research Institute, China), Lili Wen (State Grid Chongqing Economic Research Institute, China), Caoyang Cheng (Chongqing University, China), Qian Zhou (State Grid Chongqing Electric Power Company, China), Li Fan (State Grid Chongqing Economic Research Institute, China), Yuan Zhu (State Grid Chongqing Electric Power Company, China), Honhjie Yu (State Grid Chongqing Economic Research Institute, China), Piao Du (State Grid Chongqing Economic Research Institute, China), and Xinxin Fang (Chongqing University, China)	292
Research on Filed Investigation Techniques for Storage and Transportation Accidents of Hazardous Goods in Ports Lili Jiang (China Waterborne Transport Research Institute, China), Chao Han (China Waterborne Transport Research Institute, China), and Fengyun Chen (China Waterborne Transport Research Institute, China)	298
Intelligent Management and Data Platform Architecture on Important Parts of Rail Vehicles Jiewei Du (National Innovation Center of High Speed Train, China), Xuhe Zhan (National Innovation Center of High Speed Train, China), Tao Zhang (National Innovation Center of High Speed Train, China), Taimu Jin (National Innovation Center of High Speed Train, China), and Minghua Zhao (National Innovation Center of High Speed Train, China)	303
Review of Digital Twin for Intelligent Transportation System Lixia Bao (Shanghai Urban Construction Design and Research Institute Group Co., Ltd., China), Qiulan Wang (Shanghai Urban Construction Design and Research Institute Group Co., Ltd., China), and Yan Jiang (Shanghai Urban Construction Design and Research Institute Group Co., Ltd., China)	309

The Research on Trafficability of Large-Sized Vehicles at Small-Radius Curves in Myanmar	
Pale - Gangaw Road	316
Hongqing Yang (Research Institute of Highway Ministry of Transport,	
China), Sui Chao (Research Institute of Highway Ministry of Transport,	
China), Baiyan Gong (Research Institute of Highway Ministry of	
Transport, China), and Wei Li (Research Institute of Highway Ministry	
of Transport, China)	
Author Index	. 321