2023 Smart City Challenges & **Outcomes for Urban Transformation (SCOUT 2023)**

Singapore 29-30 July 2023



IEEE Catalog Number: CFP23BN9-POD ISBN:

979-8-3503-0138-0

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:
 CFP23BN9-POD

 ISBN (Print-On-Demand):
 979-8-3503-0138-0

 ISBN (Online):
 979-8-3503-0137-3

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 Smart City Challenges & Outcomes for Urban Transformation (SCOUT) **SCOUT 2023**

Table of Contents

Preface	xii
Message from Program Chair	xiii
Acknowledgements	xvii
Organizing Committee	xviii
Program Committee	xix
Sponsors	
Technological infrastructure for smart cities support	
Study of Smart City Tourist Attractions Based on Spatial Pattern POI Data	1
Evaluation Model of Service Quality of Tourist Destination Inn Minshuku Based on F	uzzy
Clustering Algorithm	•
Tonggao Xu (Shandong Vocational and Technical University of	
International Studies, China), Yingying Tan (Shandong Vocational and	
Technical University of International Studies, China), and Shujuan	
Chen (Shandong Vocational and Technical University of International Studies, China)	
	_
Investigating the Effects of Promoting the Development of the Digital Economy in the	
Chengdu-Chongqing Region Using the Example of Building Digital Infrastructure	14
Qi He (Sichuan University, China)	
Application of Power Internet of Things in Online Monitoring of Transmission Lines	19
Jianxiong Wu (State Grid Electric Power Space Technology Company	
Limited, China), Wei Du (State Grid Electric Power Space Technology	
Company Limited, China), Jiaying Wang (State Grid Electric Power Space	
Technology Company Limited, China), Guozhu Yang (State Grid Electric	
Power Space Technology Company Limited, China), and Yajie Zhao (State	
Grid Electric Power Space Technology Company Limited, China)	
Simulation of Voltage Response Model of New Energy Photovoltaic Power Generation	on System
Based on Improved Genetic Algorithm	
Xiaolan Bai (State Grid New Energy Cloud Technology Co., Ltd, China),	
Ran Ji (State Grid New Energy Cloud Technology Co., Ltd, China), Yu	
Shan (State Grid New Energy Cloud Technology Co., Ltd, China), and	
Qiya Huang (State Grid New Energy Cloud Technology Co., Ltd, China)	

Construction of User Identity Authentication Model for New Electric Power System	
Research on the Application of SAR Differential Interferometry Technology in Monitoring Surface Deformation of Transmission Lines	
Research on the Application of Voice Recognition Algorithm Based on Neural Network Model in Piano Teaching	
Research on the Adaptive Control Method of Quadrotor Based on Neural Network	
Research on the Control Strategy of Modular Multi-Level Inverter Based on a Fusion Intelligent Algorithm	
Design of Intelligent Gas Leakage Inspection Robot Based on STM32	
Multi-Agents with Adapter for Crowd Detection	
A Target Value Determination Method of Energy Supply Equipment Based on Mapreduce Architecture	

Algorithm	71
Peng Lu (Shenyang High tech Human Resources Service Co., Ltd, China) and Danni Zha (Shenyang High tech Human Resources Service Co., Ltd, China)	
USV Course Control Strategy Based on the Disturbance Observer Under Disturbances of Winds and Waves	76
Xiuren Yue (Hohai University, China)	
Research on Optimization Algorithm of Airline Crew Scheduling System Based on Convolutional Neural Network	81
International Studies, China) and Tonggao Xu (Shandong Vocational and Technical University of International Studies, China)	
Optimization Design of a Wheeled Extraction Robot by the Modified Simulated Annealing Algorithm	86
Haipeng Wang (Jiangsu College of Engineering and Technology, China) and Lequn Fu (Huazhong University of Science and Technology Wuhan, China)	
Design and Motion Analysis of Gripper for Bionic Robot	91
Multi-Sensor Co-Detection Alliance Solving Based on Chemical Reaction Optimization Algorithm Fuqi Yang (Air Force Engineering University), Daozhi Wei (Air Force Engineering University), Aobo Qiu (Air Force Engineering University), Junwei Li (Air Force Engineering University), and Li Xiangdong (95685 Troops)	101
A Low Profile Microstrip Array Antenna for Automotive Radar Yuejuan Wang (Shanghai LimRadar Electronic Technology Co., Ltd., China), Haiyang Zhu (Shanghai LimRadar Electronic Technology Co., Ltd., China), Xu Zhang (Shanghai LimRadar Electronic Technology Co., Ltd., China), Leilei Wang (Shanghai LimRadar Electronic Technology Co., Ltd., China), and Song Li (Shanghai LimRadar Electronic Technology Co., Ltd., China)	108
Digital Twin Technology is Considered and Practiced in the Intelligent Management of Buildings	113
Urban mobility	
Research on Earthquake Prediction Effect Based on Multi-Prediction Analog Model	118

Research on Risk Assessment Model of Physical Hazards of Consumer Goods Safety	123
Analysis of the Interaction between Urban Transportation and Land Use Based on Multi-Perspectives Method	129
Research on the Application of Machine Learning in the Construction of Power Demand Response Model for Edge Computing	l35
Application and Innovation of BIM Technology in Urban Underground Fast Passage	140
Metro Report: Building Urban Rail Infrastructure and Image in Kolkata, India	146
Data management	
Research on Emergency Scenario Deduction Method for Improving Contingency Capacity	158
Application of Unmanned Aerial Vehicle Intelligent Patrol Inspection in Transmission Line Control and Data Processing	165
Application and Analysis of Polarization Matching for Short-Wave Receiving Antennas	170

Rudder Modeling Based on CATIA V6	175
Research on Cockpit Display Simulation Method Based on SCADE	179
BIM Technology Advances to Promote the Development of the City	184
Research on Security Protection Technology of Power System Information Network Facing Zero Trust Network Environment Xin Li (Electric Power Research Institute of Guangxi Power Grid Co., Ltd, China), Dongmei Bin (Electric Power Research Institute of Guangxi Power Grid Co., Ltd, China), Chunyan Yang (Electric Power Research Institute of Guangxi Power Grid Co., Ltd, China), Ying Ling (Electric Power Research Institute of Guangxi Power Grid Co., Ltd, China), and Songming Han (Electric Power Research Institute of Guangxi Power Grid Co., Ltd, China)	190
Research on BIM-Oriented Prefabricated Building Information Management	195
Application Research of Intelligent Site Management System Qingjuan Liu (Shandong Xiehe University, China), Feng Zhang (Jinan Sijian Construction Group Co., Ltd, China), and Luhao Qu (Jinan Sijian Construction Development Co., Ltd., China)	201
Responsible innovation	
Dynamic Resource Management: An Approach for Cloud Computing Environment Biswajit Nayak (School of Law, KIIT University (Kalinga Institute of Industrial Technology)), Bhubaneswari Bisoyi (Sri Sri University, India), Biswajit Das (Kalinga Institute of Industrial Technology, India), and Prasant Kumar Pattnaik (Kalinga Institute of Industrial Technology, India)	206
A Particle Swarm Algorithm Based Model for Selecting the Location of Smart Logistics Distribution Centres	211
Research on Early Warning Mechanism of Highspeed Railway Subgrade Settlement Based on Artificial Neural Network Fang Liang (Wuhan Railway Vocational College of Technology, China)	218
Construction of Mathematical Model for the Influence of Agricultural Science and Technology Investment on Agricultural Economy	223
Simulation of Influenza Virus Aerosol Transmission in Communities Based on the FLUENT	227

Research on Application Method of Image Segmentation Based on Fuzzy Clustering	232
Smart Diagnosis - An Intelligent Judgment System Based on Valid Characteristics of Depressed People Yu Peng (Chongqing Jiaotong University, China), Songming Xie (Chongqing Jiaotong University, China), Yixuan Yang (Chongqing Jiaotong University, China), Han Yang (Chongqing Jiaotong University, China), and Xing Zhang (Chongqing Jiaotong University, China)	237
Research on the Application Scenario of Internet of Things Technology in the Construction of Smart Countryside Haifei Wang (Zhaoqing University, China)	242
Create an Online Exam System Using Genetic Algorithms Wanxuan Lin (Criminal Investigation Police University of China, China)	249
Event-Triggered Sliding Mode Control of a QUAV Based on a Disturbance Observer	253
The Event-Triggered Sliding Mode Control for a QUAV Based on a Disturbance Observer	258
Optimal Design of Feature Extraction Filter for UAV Acoustic Signal Recognition Wentai Sheng (Civil Aviation University of China, China), Cong Liu (Civil Aviation University of China, China), Yigang Sun (Civil Aviation University of China, China), and Zezhong Shan (Civil Aviation University of China, China)	263
Security Analysis of UAV Wireless Communication Based on AirSim Shangting Miao (Northwestern Polytechnical University, China), Li Yang (Northwestern Polytechnical University, China), and Pan Quan (Northwestern Polytechnical University, China)	268
The Effect of ATC Surveillance System Interface Design and Usability on Air Traffic Controller Cognitive Load	273
Design of Speech Recognition and Language-Assisted Instruction System Based on Artificial Intelligence from the Perspective of Second Language Acquisition	279
Analysis of International Competitive Landscape for Large Language Model Technologies Based on Patent Metrics	285

Disaster management

Application of Fuzzy Comprehensive Assessment Model in Risk Assessment of Hazardous Chemicals Storage in Power Grid Enterprises	290
Yang Zhang (State Grid Corporation of China, China), Jing Chu (Beijing Dianlianke Power Technology Development Co., Ltd, China), Fanwei Kong (State Grid Hebei Electric Power Supply co., Ltd., China), Qiwei Peng (Nanjing NARI Information and Communication Technology, Co., Ltd., China), and Xizheng Cao (Beijing Herosail Power Science & Technology Co., Ltd., China)	
Design and Development of Power Failure and Restoration Scene State Analysis System Based	
on AR	296
Visual Monitoring of Power Failure Based on GIS and UE4 Technology	301
Design of Intelligent Hoist System Based on STM32	306
Research on Modeling and Calibrating Method of Two-Stage Turbocharged Diesel Engine Simulation Model	311
Noncommissioned Officers, China) and Li Changting (Army Academy of Armored Forces, School of Noncommissioned Officers, China)	
Research on Ecosystem Monitoring and Improvement of Smart City Based on Big Data Algorithm. 3 Yu Meng (Mianyang Teachers' College, China), Yufei Wang (Mianyang Teachers' College, China), and Bing Zhu (Mianyang Teachers' College, China)	316
Research on Rural Industry Upgrading Driven by Digital Technology Under the Background of Rural Revitalization	322
Author Index	327