

# **2024 3rd International Conference on Smart City Challenges & Outcomes for Urban Transformation (SCOUT 2024)**

**Bhubaneswar, India  
26-27 July 2024**



**IEEE Catalog Number: CFP24BN9-POD  
ISBN: 979-8-3315-2864-5**

**Copyright © 2024 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:	CFP24BN9-POD
ISBN (Print-On-Demand):	979-8-3315-2864-5
ISBN (Online):	979-8-3315-2863-8

**Additional Copies of This Publication Are Available From:**

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

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# 2024 3rd International Conference on Smart City Challenges & Outcomes for Urban Transformation (SCOUT) **SCOUT 2024**

## Table of Contents

Preface .....	ix
Message from the Program Chair .....	x
Acknowledgements .....	xiii
Organizing Committee .....	xiv
Program Committee .....	xvi
International Advisory Committee .....	xvii
Sponsors .....	xviii

## Technological Infrastructure for Smart Cities Support

Optimization of Electrical Energy Saving in Large Public Buildings Combined with BIM Platform .....	1
<i>Zixin Deng (Jiangxi University of Finance and Economics, China) and Gang Li (Jiangxi University of Finance and Economics, China)</i>	
Design and Research on Smart Community Information System Based on Big Data .....	8
<i>Hongyuan Wang (Guangdong University of Science and Technology, China), Sheena Guzman-Gumarang (St. Paul University Philippines, Philippines), and Zhen Qin (Guangdong University of Science and Technology, China)</i>	
The Study on the Impact of Intercity Railway Optimization on Regional Economic Growth Based on GIS Technology .....	14
<i>Chen Guo (Wuhan East Lake University, China) and Chen Ying (Wuhan Caidian District Experimental Senior High School, China)</i>	
Forecast of Passenger Flow in the Peak Hours and Holidays of Beijing Subway Based on RNN Model .....	19
<i>Chenyu Liu (Beijing Institute of Technology, China)</i>	
Anomaly Detection in Logistics Warehouses Based on YOLOv8 .....	24
<i>Tianwei Shi (Shanghai University, China)</i>	
Analyzing the Spatial Autocorrelation of Logistics Nodes using the Geographically Weighted Regression Model .....	31
<i>Xiangfei Gong (Shanghai Maritime University)</i>	

Design and Implementation of a Multi-Drone Cooperative Airspace Management System .....	37
<i>Nan Wu (Air Force Engineering University), Zhiyuan Huang (Air Force Engineering University), and Jikang Guo (Shijiazhuang Flight Academy)</i>	
Design of an FPGA-Based Smart Block Handling System .....	42
<i>Chenxu Li (China University of Petroleum (East China)), Ronghui Kang (China University of Petroleum (East China)), Fuyuan Song (China University of Petroleum (East China)), Ruolin Ran (China University of Petroleum (East China)), Yuanlin Gao (China University of Petroleum (East China)), Yanning Zhao (China University of Petroleum (East China)), Jiawen Ren (China University of Petroleum (East China)), and Yifei Wang (China University of Petroleum (East China))</i>	
Machine Learning-Based Flood Risk Prediction: An Analysis of the Effectiveness of Random Forest Models .....	47
<i>Pengbo Zhao (North China University of Technology, China), Mo Zhai (North China University of Technology, China), and Haoran Qi (North China University of Technology, China)</i>	
Machine Learning-Based Analysis of Resident Behaviour Patterns and Urban Planning in Smart Cities .....	52
<i>Zhenya Peng (Hunan University of Information Technology, Changsha), Ya Zhao (Hunan University of Information Technology, Changsha), and Zhongman Luo (Changsha Rail Transit Institute, Changsha)</i>	
Research on Building Thermal Load Prediction Method Based on Stacked XGBoost and Neural Network Models .....	58
<i>Xuan Chen (Yunnan University of Finance and Economics, China) and Sijian Zhao (Yunnan University of Finance and Economics, China)</i>	

## Responsible Innovation through Strategic Data Management

Application of Comprehensive Evaluation to Comprehensive Benefit Evaluation of Prefabricated Buildings .....	63
<i>Yufei Fu (Macau University of Science and Technology, China) and Kin Hong Ip (Macau University of Science and Technology, China)</i>	
Exploration of Smart Business and Big Data Campus Training Base Construction .....	68
<i>Zhou Li (Wuhan Business University, China)</i>	
Utilizing Artificial Intelligence Technology to Enhance the Efficiency of Food Safety Supervision .....	74
<i>Dongmei Zhang (Shandong Business Institute, China), Yanbing Du (Shandong Business Institute, China), and Lixue Yuan (Shandong Business Institute, China)</i>	
Application of Nondestructive Testing Technology Based on Convolutional Neural Network in Fruit Internal Quality Evaluation .....	79
<i>Shuo Zeng (Xinjiang Agricultural University, China), Qin Ma (Xinjiang Agricultural University, China), and Guiyin Li (Tianjin University of Science and Technology, China)</i>	

Design of Digital Empowered Smart Classroom System .....	85
<i>Xiao Bo (Guangdong University of Science and Technology, China), Fengyi Chen (Guangdong University of Science and Technology, China), and Haixiang Liang (Guangdong University of Science and Technology, China)</i>	
Research on Predicting and Classifying the Effect of Mental Health Intervention for Vocational College Freshmen Based on Machine Learning Model .....	91
<i>Yansen Zhang (Lanzhou Vocational Technical College, China), Xiaoquan Chang (Lanzhou Vocational Technical College, China), Yaning Ding (Lanzhou Vocational Technical College, China), and Zhaoqi Li (Lanzhou Vocational Technical College, China)</i>	
Research on the Application of Bayesian Network and Deep Learning in Insurance Fraud Detection .....	97
<i>Xueke Song (Henan University, China)</i>	
Impact of Climate Change and Regional Conflicts on Goal Interconnectivity under Network Analysis of the Sustainable Development Goals (SDGs) .....	103
<i>Xiao Du (Beijing Union University, China)</i>	
Exploring the Efficacy of Artificial Intelligence Models in the Strategic Analysis of Green Finance for Sustainable Environmental Development .....	108
<i>Zhenyu Wu (Xi'an University of Finance and Economics, China), Riming Jin (Xi'an University of Finance and Economics, China), Qiwei Chen (Xi'an University of Finance and Economics, China), Zhuo Duan (Xi'an University of Finance and Economics, China), and Yibin Ma (Xi'an University of Finance and Economics, China)</i>	
Innovative Applications of Artificial Intelligence in Environmental Protection .....	115
<i>Chong Yin Lau (University College London, England)</i>	
Research on the Development Path of Rural E-Commerce in Hubei Province Under the Perspective of Rural Revitalization .....	121
<i>Yanni Xu (Hubei Business College, China) and Ruoyu Xu (Hubei Business College, China)</i>	

## Smart City Innovations

Numerical Simulation of Star-Diamond Type Self-Anchored Suspension Bridge Considering Stacked Girder Connections .....	126
<i>Zeng Ruixiang (CCCC Second Harbor Engineering Company Ltd, China), Hu Bo (CCCC Second Harbor Engineering Company Ltd, China), Xu Liang (Changchun Institute of Technology, China), Zhou Changsong (Changchun Institute of Technology, China), and Wang Wei (Changchun Institute of Technology, China)</i>	
Optimization and Control of Oil Processing Process Based on Deep Learning .....	132
<i>Yanbing Du (Shandong Business Institute, China), Dongmei Zhang (Shandong Business Institute, China), and Xiaoli Yi (Shandong Business Institute, China)</i>	
Construction of International Sports Communication Influence Model Based on Data Mining .....	137
<i>Fangni Li (Communication University of China, P.R. China)</i>	

Optimization of Underwater Acoustic Channel Detection and Location Technology by Numerical Model .....	144
<i>Yumeng Yuan (Harbin Engineering University, China)</i>	
Short Text Sentiment Analysis Based on Multi-Head Attention Mechanism and Network Representation Learning .....	149
<i>Ning Gu (Changchun Institute of Education, China) and Yiming Wang (Changchun Institute of Education, China)</i>	
Multivariate Financial Time Series Forecasting Model Based on Transformer Architecture .....	155
<i>Ruibo Wu (University of California, CA)</i>	
Dynamic Credit Risk Assessment Based on Multi-Task Deep Learning and Bayesian Optimization. 162	
<i>Ruibo Wu (University of California, CA)</i>	
Fraud Detection using Machine Learning: An Evaluation of Logistic Regression and Random Forest .....	169
<i>Xijie Zhang (Hong Kong Baptist University, China)</i>	
Improving NLP Tasks in Movie Review Analysis using ChatGPT Data Generation-Based Augmentation .....	174
<i>Yiyang Lin (Auckland University of Technology, New Zealand)</i>	
Research on Position Prediction and Search-and-Rescue Optimization Algorithm for Small Submarines using Machine Learning .....	179
<i>Yuyao Wang (Southwest University)</i>	
<b>Author Index .....</b>	<b>185</b>