2023 International Conference on Networks, Communications and **Intelligent Computing** (NCIC 2023)

Suzhou, China 17 – 19 November 2023



IEEE Catalog Number: CFP23UW2-POD ISBN:

979-8-3503-7195-6

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:
 CFP23UW2-POD

 ISBN (Print-On-Demand):
 979-8-3503-7195-6

 ISBN (Online):
 979-8-3503-7194-9

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-040

Phone: (845) 758-0400 Fax: (845) 758-2633

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



2023 International Conference on Networks, Communications and Intelligent Computing (NCIC) NCIC 2023

Table of Contents

	lessage from the General Chair xiv ommittee xv
	023 International Conference on Networks, Communications and ntelligent Computing
M Re	fulti-Relationship and Multi-Attribute Fusion Based on Graph Neural Network for API ecommendation
A	Heterogeneous Design Method for Reconfigurable Cryptographic Computing Array
Re	esearch on Graph Neural Network Algorithms for Financial Anomaly Detection
D	esign of a Rough set-Based System for Evaluating Internalization Efficiency

Evaluation Method of Access Strategy for Massive Collection Devices Based on Fuzzy Analytic Hierarchy Process
Guangcheng Xie (State Grid Chongqing Electric Power Company Marketing Service Center, China), Siwei Wang (State Grid Chongqing Electric Power Company Marketing Service Center, China), Ke Hu (State Grid
Chongqing Electric Power Company, China), Hongyu Xu (State Grid
Chongqing Electric Power Company Marketing Service Center, China),
Wenli Chen (State Grid Chongqing Electric Power Company Marketing Service Center, China), and Yu Su (State Grid Chongqing Electric Power
Company Marketing Service Center, China)
DCPGRN: A Dynamic Climate Pattern Graph Recurrent Network for Weather Forecasting
A New Digital-Analog Hybrid Beamforming Base Station Architecture Based on RIS
Institute, China), Guizhen Wang (China Mobile Research Institute,
China), Li Zhang (China Mobile Research Institute, China), Jia Dong
(China Mobile Research Institute, China), and Nairong Jiang (China Mobile Research Institute, China)
Temporal Attention Convolutional Neural Networks Based on LSTM-Encoder for Time Series
Forecasting 51
Yantong Zhou (Mingyang Smart Energy group Co, Ltd, China), Ziwen Chen (Suzhou Hengrui Hongyuan Medical Technology co., ltd., China), and
Anqi Xie (Xi'an Jiaotong - Liverpool University, China)
Dynamic Reconfiguration for Service Function Chain Orchestration in Next Generation
Networks
Technology, China), Jizhe Zhou (China Academy of Information and
Communications Technology, China), Kaifeng Han (China Academy of
Information and Communications Technology, China), and Ying Du (China
Academy of Information and Communications Technology, China)
A Novel Federated Learning Model Aggregation Method Empowered by Coordination of Computing and Networking
Shoufeng Wang (AsiaInfo technologies (China) INC., China), Hua-Min
Chen (Beijing University of Technology, China), Jianchao Guo (AsiaInfo
technologies (China) INC., China), Ye Ouyang (AsiaInfo technologies
(China) INC., China), Fan Li (China Unicom Beijing Branch, China),
Xuan Chen (China Unicom, China), Yun Li (AsiaInfo technologies (China)
INC., China), Leiming Ma (AsiaInfo technologies (China) INC., China), Jie Sun (AsiaInfo technologies (China) INC., China), and Shuling Wang
(AsiaInfo technologies (China) INC., China)
Optimal Joint Trajectory and Caching with Graph-Based Federated Knowledge Distillation in
UAV-Assisted Networks 68
Gerald Tietaa Maale (University of Electronic Science and Technology of China, China), Noble Arden Elorm Kuadey (University of Electronic
Science and Technology of China, China), Guolin Sun (University of
Electronic Science and Technology of China, China), and Guisong Liu
(Southwestern University of Finance and Economics, China)

Collaborative Intelligent Resource Trading for RAN Slicing: A Federated Policy Distillation Approach Daniel Ayepah-Mensah (UESTC, Chengdu, China; National Key Laboratory for Intelligent Collaborative Computing, China; Intelligent Terminal Key Laboratory of Sichuan Province, China) and Guolin Sun (UESTC, Chengdu, China; National Key Laboratory for Intelligent Collaborative Computing, China; Intelligent Terminal Key Laboratory of Sichuan Province, China)	. 73
Study of Transmission Delay Estimation for 5G Positioning	78
The Study of Low-Level Authentication Mechanism Based on Physical Layer Characteristics Kai Chen (China Telecom, China), Longru Chen (China Telecom, China), Jianxian Lu (China Telecom, China), Gaoyuan Dai (South China University Of Technology, China), Zhe Wang (China Telecom, China), and Liyang Yu (Beijing University of Posts and Telecommunications, China)	. 84
An Efficient Phone Number Multiplexing Method Based on IMS	. 89
Performance Improvement Method of Multi-Carrier Fusion Communication Technology	.96
Multi-Objective Optimization on Stealthy False Data Injection Attack in Smart Power Transmission Grid Tong Ye (Zhejiang Lab), Boyang Zhou (Zhejiang Lab; UCAS HIAS), Yinghui Nie (Zhejiang Lab), and Zhen Zhu (Zhejiang Lab)	102

Multiparty Secure Delegated Quantum Computation Shuquan Ma (Optical Communication Research and Development Center, 54th Research Institute of China Electronics Technology Group Corporation, China), Xuchao Liu (Optical Communication Research and Development Center, 54th Research Institute of China Electronics Technology Group Corporation, China), Huagui Li (Optical Communication Research and Development Center, 54th Research Institute of China Electronics Technology Group Corporation, China), and Heliang Song (Optical Communication Research and Development Center, 54th Research Institute of China Electronics Technology Group Corporation, China)	106
A Power Monitoring Network Attack Detection Mechanism Based on Graph Convolutional Neural Network Zhuo Lv (State Grid Henan Electric Power Research Institute, China), Ming Wang (State Grid Corporation of China, China), Hao Chang (State Grid Henan Electric Power Research Institute, China), Zheng Zhang (State Grid Henan Electric Power Research Institute, China), Cen Chen (State Grid Henan Electric Power Research Institute, China), and Junfei Cai (State Grid Henan Electric Power Research Institute, China)	
Trustworthiness Evaluation System of UEIOT Devices Based on Deep Learning	116
Physical Layer Key Distribution Technology on Deep Learning Yuhao Shi (University of Electronic Science and Technology of China, Institute of Aeronautics and Astronautics, China), Jie Tang (University of Electronic Science and Technology of China, Institute of Aeronautics and Astronautics, China), Ruifei Wang (University of Electronic Science and Technology of China, Institute of Aeronautics and Astronautics, China), Hong Wen (University of Electronic Science and Technology of China, Institute of Aeronautics and Astronautics, China), Pin Han-Ho (The University of Waterloo 200 University Avenue West Waterloo, Canada), and Shih Yu Chang (The University of Waterloo 200 University Avenue West Waterloo, Canada)	123
On the Covert Performance of Ambient Backscatter Communications Sen Qiao (Nanjing University of Information Science and Technology, China), Junjie Zhao (Nanjing University of Information Science and Technology, China), James Msughter Adeke (Nanjing University of Information Science and Technology, China), Kai Chen (Nanjing University of Information Science and Technology, China), and Guangjie Liu (Nanjing University of Information Science and Technology, China)	128
Intelligent Assembly Algorithm Based on Machine Learning	141

DeepFedKDAD: Deep Federated Knowledge Distillation Based Anomaly Detection in B5G Netwo licing	
Noble Arden Elorm Kuadey (University of Electronic Science and Technology of China, China), Gerald Tietaa Maale (University of Electronic Science and Technology of China, China), Guolin Sun (University of Electronic Science and Technology of China, China), and Guisong Liu (Southwestern University of Finance and Economics, China)	110
Oynamic Real-Time Heart Rate and Blood Pressure Detection for Multiple Individuals Litao Guang (North China University of Technology, China) and Jiancheng Zou (North China University of Technology, China)	. 152
ntelligent Warehouse Material Detection Based on RFID and Deep Learning	. 157
Optimizing MAC Performance of LoRa Networks in Complex Business Scenarios Honggang Wang (Xi'an University of Posts and Telecommunications, China), Junyan Lu (Xi'an University of Posts and Telecommunications, China), Ziru Yao (Xi'an University of Posts and Telecommunications, China), Xute Wang (Xi'an University of Posts and Telecommunications, China), Xiangyang Pang (Xi'an University of Posts and Telecommunications, China), and Ruoyu Pan (Xi'an University of Posts and Telecommunications, China)	. 162
Research on A Distributed Cooperative Transmission Scheme with Edge Computing Hua-Min Chen (Beijing University of Technology, China), Ruijie Fang (Beijing University of Technology, China), Tao Chen (MediaTek (Beijing), China), Hui Li (Beijing University of Technology, China), Fan Li (China Unicom Beijing Branch, China), and Shaofu Lin (Beijing University of Technology, China)	170
A Study on Resource Allocation for Mobile Edge Computing-Assisted Industrial IOT	. 176
Top K Nearest Book Searching Approach in Metaverse Libraries Based on R-Tree	183
Mobility-Aware Offloading Scheme for 6G's Real-Time Tasks with Temporal Graphs and Graph Matching Jianhong Cai (Nanjing University of Posts and Telecommunications, China), Hao Gu (Nanjing University of Posts and Telecommunications, China), and Xiaorong Zhu (Nanjing University of Posts and Telecommunications, China)	189

Detection of Diabetic Retinopathy Based on Target Detection Algorithm Jingjing Xiao (Xiamen University of Technology, China), Wanlong Li (Xiamen University of Technology, China), Mengxia Jiang (Xiamen University of Technology, China), and Rongjie Chen (Xiamen University of Technology, China)	195
Shrinking Mechanism as an Alternative to Cumulative Step-Size Adaptation for Evolution Strategy Bo Zhang (University of Jinan, China), Lin Wang (Quan Cheng Laboratory, China; University of Jinan, China), and Bo Yang (Quan Cheng Laboratory, China; University of Jinan, China)	201
High-Capacity Reversible Data Hiding in Encrypted 3D Models Based on Secure Multiway Tree Traversal Xu Wang (University of Jinan, China), Jing Liu (Shandong Branch of National Computer network Emergency Response technical Team/Coordination Center of China, China), and Kun Tang (Shandong Branch of National Computer network Emergency Response technical Team/Coordination Center of China, China)	206
An End-to-End Delay Analysis Method for Dual-Mode Communication Networks Combining PLC RF Based on Martingale Theory	
Optimizing Resource Allocation in Edge Computing to Reduce Delay Based on Multi-Layer Particle Swarm Optimization Xiaoman Kong (University of Jinan, China), Bo Yang (University of Jinan, China; Quan Cheng Laboratory, China), and Yamin Han (Quan Cheng Laboratory, China)	217
Constructing High-Resolution Microstructure Image for Cement Hydration Using Real-ESRGAN . Yingying Han (University of Jinan, China), Liangliang Zhang (University of Jinan, China; Quan Cheng Laboratory, China), Lin Wang (University of Jinan, China; Quan Cheng Laboratory, China), and Bo Yang (University of Jinan, China; Quan Cheng Laboratory, China)	222

An Improved Apriori Algorithm Based on Goal Orientation and Double Pruning Shiyu Deng (Laboratory of Big Data Decision Making for Green Development, Beijing International Science and Technology Cooperation Base of Intelligent Decision and Big Data Application, Beijing Information Science and Technology University Beijing, People's Republic of China, China), Li Li (Laboratory of Big Data Decision Making for Green Development, Beijing International Science and Technology Cooperation Base of Intelligent Decision and Big Data Application, Beijing Information Science and Technology University Beijing, People's Republic of China, China), Yichen Xiong (Laboratory of Big Data Decision Making for Green Development, Beijing International Science and Technology Cooperation Base of Intelligent Decision and Big Data Application, Beijing Information Science and Technology University Beijing, People's Republic of China, China), and Jian Zhang (Laboratory of Big Data Decision Making for Green Development, Beijing International Science and Technology Cooperation Base of Intelligent Decision and Big Data Application, Beijing Information Science and Technology University Beijing, People's Republic of China, China)	226
Joint Optimization Algorithm of Traffic Scheduling and Routing of Latency Sensitive Services for Time-Sensitive Networking	231
Deep Learning Based Adaptive Physical Layer key Distribution Ruifei Wang (University of Electronic Science and Technology of China, China), Jie Tang (University of Electronic Science and Technology of China, China), Yuhao Shi (University of Electronic Science and Technology of China, China), Hong Wen (University of Electronic Science and Technology of China, China), Pin-Han Ho (The University of Waterloo 200 University Avenue West Waterloo, Canada), and Shih Yu Chang (The University of Waterloo 200 University Avenue West Waterloo, Canada)	238
Design of An Ultra-Wide-Angle Metamaterial Absorber Based on Antenna Reciprocity	243
A Frequency Tunable Metagrating Absorber Within an Expanded Frequency Band	248

Research on TR-STBC Coding Technology in Shortwave MIMO Channels Xiaobao Luo (Wuhan Maritime Communication Research Institute, China), Jian Lin (Wuhan Maritime Communication Research Institute, China), Weiheng Cheng (Wuhan Maritime Communication Research Institute, China), Yunxiang Gao (Chongqing University of Technology, China), and Liukui Chen (Chongqing University of Science & Technology, China)	253
ndoor Visible Light Positioning Algorithm Based on Point and Line Feature Visual Information in Occluding Environment Xiangyun Ji (Jiangsu University, China) and Xu Bao (Jiangsu University, China)	258
An Approach for Searching the Top K Nearest Areas Based on R-Tree	267
Threat Tracing of Power Distribution Automation System Based on Spatiotemporal and Business Logic Correlation Technology of Security Events	273
Design and Implementation of a LoRa Adaptive Rate Algorithm Based on Power Optimization Honggang Wang (Xi'an University of Posts and Telecommunications, China), Hao Chen (Xi'an University of Posts and Telecommunications, China), Junyan Lu (Xi'an University of Posts and Telecommunications, China), Bohan Zhang (Xi'an University of Posts and Telecommunications, China), Shengli Pang (Xi'an University of Posts and Telecommunications, China), and Ruoyu Pan (Xi'an University of Posts and Telecommunications, China)	279
Using Logical Prompts to Automatically Solve Math Word Problems Siwei Liu (North China University of Technology, China) and Jiancheng Zou (North China University of Technology, China)	. 286
Enhancing Chinese Font Recognition with Convolutional Neural Networks	291
Approximation of Gamma Distribution by Two-Branch Mixture of Erlang Distributions Dan Yang (National University of Defense Technology, China) and Mengjun Li (National University of Defense Technology, China)	. 296
Design of a new Detection System for Anti-Virtualization Malicious Code	.302

thor Index	2	٥7
mor muex	יכ.	U/