

# **2022 International Conference on Informatics, Networking and Computing (ICINC 2022)**

**Nanjing, China  
14-16 October 2022**



**IEEE Catalog Number: CFP22DP8-POD  
ISBN: 979-8-3503-0970-6**

**Copyright © 2022 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:	CFP22DP8-POD
ISBN (Print-On-Demand):	979-8-3503-0970-6
ISBN (Online):	979-8-3503-0969-0

**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

# 2022 International Conference on Informatics, Networking and Computing (ICINC) **ICINC 2022**

## Table of Contents

Preface .....	xii
Organizing Committee .....	xiii
International Technical Program Committee .....	xv

### Communication Technology and Information Processing Forecast

Research on Testing Technology of Oil Free Compressor Air Valve of Rail Transit Air Source Device Based on PV Diagram .....	1
<i>Yang Yu (Hefei General Environment Control Technology Co., Ltd., China), Yue Shu (Hefei General Machinery Research Institute Co., Ltd., China), Fengyu Li (Hefei General Machinery Research Institute Co., Ltd., China), Quanchen Zhu (Hefei General Environment Control Technology Co., Ltd., China), Bin Cao (Hefei General Environment Control Technology Co., Ltd., China), and Yi Fang (Hefei General Environment Control Technology Co., Ltd., China)</i>	
Research on file Filtering Driven Encryption Method for 3D Geographic Information Data .....	5
<i>Haiyan Xu (Zhejiang College of Security Technology, China), Anfeng Zhu (Zhejiang College of Security Technology, China), Hao Zhang (Zhejiang College of Security Technology, China), and Gang Xu (Zhejiang College of Security Technology, China)</i>	
QoS-Based Dynamic Clustering Deployment Strategy in MEC .....	10
<i>Yangyang Zha (Beijing University of Posts and Telecommunications, China) and Qibo Sun (Beijing University of Posts and Telecommunications, China)</i>	
Research on Term Extraction of the Belt and Road Initiative Texts Based on BERT Model .....	15
<i>Zhengang Yang (Xi'an Fanyi University, China)</i>	
Construction Schedule Control Method of Prefabricated Building Based on BIM .....	19
<i>Guolai Zhang (BUCG REAL ESTATE Co., LTD., China)</i>	
Three-Dimensional Imaging of Through-Wall Radar Based on Compressed Sampling in the Frequency Domain .....	24
<i>Dongpo Xu (Changchun University of Science and Technology, China), Yunqing Liu (Changchun University of Science and Technology, China), Liang Wang (Intelligent Perception and Processing Technology Laboratory, China), and Xiaolong Li (Changchun University of Science and Technology, China)</i>	

Dynamic Real-Time Research Hotspot Data Track and Visualization Platform for Think Tank Information .....	28
<i>Zhigang Di (Beijing Institute of Graphic Communication, China), Shaozhong Cao (Beijing Institute of Graphic Communication, China), Yanhong Yang (Beijing Institute of Graphic Communication, China), and Bingjie Zhang (Beijing Institute of Graphic Communication, China)</i>	
Research on Anti-Crawler and Anti-Anti-Crawler Technology .....	35
<i>Xiaolong Zhang (Tianjin University of Commerce, China), Yuan Chen (Tianjin University of Commerce, China), Jiawei Liang (Tianjin University of Commerce, China), Jiawei Zhang (Tianjin University of Commerce, China), Tianyang Lu (Tianjin University of Commerce, China), and Chuanqing Wang (Tianjin University of Commerce, China)</i>	
Application of CDMA Interference Estimation in Secure Transmission of Big Data in Blockchain Communication .....	40
<i>Tianbo Dong (Information Communication Branch of China Southern Power Grid Peak shaving and Frequency Modulation Power Generation Co., Ltd, China), Baoqiang Zhong (China Southern Power Grid Peak shaving and Frequency Modulation Power Generation Co., Ltd, China), and Yikai Tan (China Southern Power Grid Peak shaving and Frequency Modulation Power Generation Co., Ltd, China)</i>	
Detection of Distracted Driving Behavior Based on Object Information .....	44
<i>Bin Liu (Yunnan University of Finance and Economics, China), Zheng Niu (Yunnan University of Finance and Economics, China), Honggang Wu (Yunnan University of Finance and Economics, China), and Hong Ding (Yunnan Agricultural University, China)</i>	
Research on Optimization of Electric Automation Technology Based on Power System .....	49
<i>Zhiyu Deng (Chongqing Chemical Industry Vocational College, China)</i>	
Application of Cloud Computing in Data Information System Management .....	53
<i>Sanchuan Luo (Jinan University, China)</i>	
A Multi-Factor Activity Arrangement Method Based on EBSN for Different Users .....	58
<i>ZhiGuo Zhang (Shandong Institute of Commerce and Technology, China), Jia Zhu (Shandong Institute of Commerce and Technology, China), LiYing Wang (Shandong Institute of Commerce and Technology, China), XianWei Xue (Shandong Institute of Commerce and Technology, China), FanXing Meng (Shandong Institute of Commerce and Technology, China), XiaoXia Li (Shandong Institute of Commerce and Technology, China), and CaiZeng Ye (Shandong Institute of Commerce and Technology, China)</i>	
A Bayes-LSTM-Based Model for Remaining Useful Life Prediction of Rolling Bearings .....	65
<i>Tong Wu (Nanjing University of Science and Technology, China)</i>	

# Network System Security and Data Analysis

Node Importance Evaluation of Multi-Level Directed Weighted Network Based on ISM and SH Combination Model .....	69
<i>Xiang Xu (National University of Defense Technology, China), Xian-qiang Zhu (National University of Defense Technology, China), Xue-qin Huang (National University of Defense Technology, China), Ai-xin Nian (National University of Defense Technology, China), Ai-lin Liang (National University of Defense Technology, China; Nanjing University of Aeronautics and Astronautics, China), and Yuan-yuan Guo (National University of Defense Technology, China)</i>	
Design of Network Teaching System for The Literature Course Based on C/S Architecture .....	76
<i>Le Zhang (Wuhan Qingchuan University, China)</i>	
A High Performance FPGA-Based Accelerator for MobileNet .....	81
<i>Xiao Zhang (Yunnan University, China) and Jun Yang (Yunnan University, China)</i>	
Research on Used Car Price Prediction Based on Stacking Model Fusion .....	86
<i>Linyu Li (Nanjing University of Science and Technology, China) and Zhihui Ye (Nanjing University of Science and Technology, China)</i>	
Research on New Power System Network Security Guarantee System .....	91
<i>Bo Wu (Westone Information Industry INC., China), Lei Chen (Westone Information Industry INC., China), and Qi Zong (Westone Information Industry INC., China)</i>	
Research on Privacy Protection of Tongue Image Data for Traditional Chinese Medicine Diagnosis .....	95
<i>Wei Wang (Chang Chun University, China), YinDong Zhu (Chang Chun University, China), and Xin Chen (Chang Chun University, China)</i>	
Optimized Operation Method for AC-DC Hybrid Microgrid Considering Dynamic Efficiency and Maximum Absorption Power of Battery .....	101
<i>Wei Dong (China Electric Power Research Institute, China), Xiaolin Zhang (China Electric Power Research Institute, China), Guangxiu Yao (China Electric Power Research Institute, China), Jiazhi Lei (Nanjing University of Science and Technology, China), and Zhao Liu (Nanjing University of Science and Technology, China)</i>	
Design and Implementation of Personalized MOOC Recommendation System Based on Spark .....	106
<i>Donghui Li (Yunnan University, China), Xi Zhang (Yunnan University, China), and Xinyu Luo (Yunnan University, China)</i>	
Design and Implementation of Open Network Teaching System Based on Microservice Architecture .....	111
<i>Jiaxun Yang (Lyceum of the Philippines University, Philippines) and Xiaojun Zhu (Shanghai Technical institute, China)</i>	
Drug-Target Affinity Prediction Method Based on Consistent Expression of Heterogeneous Data .....	116
<i>Boyuan Liu (Georgia Institute of Technology, USA)</i>	
An Efficient Grid-Based Privacy-Preserving Framework Against User-Server Collusion in Spatial Crowdsourcing .....	122
<i>Lening Yuan (Hunan University, China), Junyi Li (Hunan University, China), and Zhimao Gong (Hunan University, China)</i>	

Research on Collaborative Technology of IPv6 Protocol and Firewall Based on IPSec .....	130
<i>Fengkun Yu (Aerospace Engineering University, China) and Xiaohong Chen (Aerospace Engineering University, China)</i>	
Research on the Application of Access Control Based on Fuzzy Constraints .....	134
<i>JiaHui Dong (Nanjing University of Aeronautics and Astronautics, China) and Shuo Zhang (Nanjing University of Aeronautics and Astronautics, China)</i>	
Research on Shared Power Service Platform System Based on Multiple Scenarios .....	138
<i>Li Wang (XJ Group Corporation, China), Peng Li (XJ Group Corporation, China), Yi Zheng (XJ Group Corporation, China), and Tiantian Zhang (XJ Group Corporation, China)</i>	
Research on 5G Security Protection System for Industry .....	142
<i>Bowen Hu (Network and Information Security Management Department, China) and Xin Heng (China Telecom Research Institute, China)</i>	
Construction and Application of Cigarette Supply and Marketing Relationship Network Based on Knowledge Graph .....	147
<i>Kai Liu (Yunnan Tobacco Company, China), Min Zhao (Yunnan Tobacco Company, China), Dazhu Yan (Yunnan Tobacco Company, China), Jia Yang (Chuxiong Tobacco Company Information Center, China), and Haoyan Shi (Yunnan Tobacco Company Tobacco leaf Division, China)</i>	
Research on Anomal flow Detection Based on Multi-Model .....	151
<i>Fangjie Chen (China Telecom Research Institute, China)</i>	
Research on Network Host Risk Assessment Method Based on Environmental Risk Level Attack Graph .....	159
<i>XuanYu Hu (Shanghai Polytechnic University, China) and WenRong Jiang (Shanghai Polytechnic University, China)</i>	
Social Network Data Publishing Model Satisfying Differential Privacy .....	163
<i>Nannan Zhou (Guizhou University, China) and Shigong Long (Guizhou University, China)</i>	

## Neural Networks and Intelligent Algorithm Modelling

Research on DSG-DSMM Evaluation Model of Data Security Based on Entropy Method and BP Neural Network and Its Application .....	169
<i>Zheng Niu (Yunnan University of Finance and Economics, China), Qitao Liu (Yunnan University of Finance and Economics, China), Xiaosong Wu (Yunnan University of Finance and Economics, China), and Houhui Yu (Yunnan University of Finance and Economics, China)</i>	
Research on Intelligent Condition Monitoring of Power System Based on Beidou Technology .....	173
<i>Nan Xiao (State Grid Liaoning Electric Power Research Institute, China), Bin Lu (State Grid Liaoning Electric Power, China), Jinliang Song (State Grid Liaoning Electric Power Research Institute, China), Huan Li (State Grid Liaoning Electric Power Research Institute, China), Hui Liu (State Grid Information and Communication Industry Group Co., China), Lishuai He (State Grid Liaoning Electric Power Extra High Voltage Company, China), Haosong Tong (State Grid Liaoning Electric Power Research Institute, China), and Qian Sun (State Grid Liaoning Electric Power Research Institute, China)</i>	

Automobile Connectors Recognition Algorithm Based on Improved Hu Invariant Moments .....	178
<i>Yan Li (Changchun University of Technology, China), Jialuo Lu (Changchun University of Technology, China), Yu Song (Dongguan SanRui Automation Technology Co., Ltd, China), Zhenguo Zhang (Changchun University of Technology, China), and Keping Liu (Changchun University of Technology, China)</i>	
Binocular Vision Based Pose Measurement using an Improved ICP Algorithm .....	183
<i>Xiaofeng Zhou (Nanjing University of Aeronautics and Astronautics, China), Ling Wang (Nanjing University of Aeronautics and Astronautics, China), and Xiang Zhang (Nanjing University of Science and Technology, China)</i>	
A Single Channel Speech Enhancement Algorithm Based on VGG19-RAFFUNet-HESE and FED-Former Model .....	188
<i>Hao Wang (Sichuan University of Science and Engineering, China; Artificial Intelligence Key Laboratory of Sichuan province), Xiaogang Wang (Sichuan University of Science and Engineering, China; Artificial Intelligence Key Laboratory of Sichuan province), Ming Rui Liu (Sichuan University of Science and Engineering, China; Artificial Intelligence Key Laboratory of Sichuan province), and Zhi Qiang Feng (Sichuan University of Science and Engineering, China; Artificial Intelligence Key Laboratory of Sichuan province)</i>	
Gearman Based Distributed Computation of Space Target Photometry .....	193
<i>Miao Tian (Space Engineering University, China), Peixuan Li (Space Engineering University, China), Wenbo Song (Space Engineering University, China), and Jieping Xu (Space Engineering University, China)</i>	
Ground Type Recognition Based on Lightweight Convolutional Neural Network .....	199
<i>Hai Feng Le (Beijing Union University, China), Lujia Zhang (Beijing Union University, China), and Yanxia Liu (Beijing Union University, China)</i>	
Intelligent Edge Computing Gateway Implementation Method Based on Microservice Architecture .....	203
<i>Kequan Lin (China Southern Power Grid Company Limited, China), Bo Liu (China Southern Power Grid Digital Grid Group Co., Ltd, China), Yuxu Chen (China Southern Power Grid Digital Grid Group Co., Ltd, China), Haoqi Dai (China Southern Power Grid Digital Grid Group Co., Ltd, China), and Zijian Liang (China Southern Power Grid Digital Grid Group Co., Ltd, China)</i>	
A Quadtree Based Piecewise Poisson Seamless Composition Algorithm for Image Stitching .....	209
<i>Xiaoming Wang (Shandong Jiaotong University, China; Capital Normal University, China) and Yixin Zhu (Capital Normal University, China)</i>	

A 3-Dimensional Histogram Publishing Algorithm for Spatiotemporal Data Based on Differential Privacy .....	214
<i>MingHao Yu (Guilin University of Electronic Technology, China; Guangxi Key Laboratory of Cryptography and Information Security, China), Wenfen Liu (Guilin University of Electronic Technology, China; Guangxi Key Laboratory of Cryptography and Information Security, China), Di Chen (Guilin University of Electronic Technology, China; Guangxi Key Laboratory of Cryptography and Information Security, China), and Shu Gao (Guilin University of Electronic Technology, China; Guangxi Key Laboratory of Cryptography and Information Security, China)</i>	
Polyester Staple Fiber Cluster Matching Localization Algorithm Based on Master-Slave Dual Cameras .....	220
<i>Dejun Li (Wuhan Textile University, China), Cheng Wang (Wuhan Textile University, China), Kang Cheng (Wuhan Textile University, China), and Yifan Wang (Wuhan Textile University, China)</i>	
Application of Virtual Simulation Technology in Campus Network Construction .....	224
<i>Xiandong Li (Shandong Institute of Commerce &amp; Technology, China), Jie Li (Shandong Institute of Commerce &amp; Technology, China), and Lijuan Yao (Shandong Institute of Commerce &amp; Technology, China)</i>	
A Novel Adaptive Variable Forgetting Factor RLS Algorithm .....	228
<i>Kai Li (Wuhan University of Technology, China), Jun Xiao (Wuhan University of Technology, China), JinFang Xie (Hubei Institute of Measurement and Testing Technology, China), and RuiQi Wu (Wuhan University of Technology, China)</i>	
A Classification Method for Network Applications using BP Neural Network .....	233
<i>Dechen Yang (Nanjing University of Aeronautics and Astronautics, China) and Ming Chen (Nanjing University of Aeronautics and Astronautics, China)</i>	
Research on Machine Learning-Based Correlation Analysis Method for Power Equipment Alarms	238
<i>Jinmeng Zhao (State Grid Information and Telecommunication Branch, China), Xingjie Huang (State Grid Information and Telecommunication Branch, China), Yating Gao (State Grid Information and Telecommunication Branch, China), Jing Zhang (State Grid Information and Telecommunication Branch, China), Beibei Su (State Grid Information and Telecommunication Branch, China), and Zixian Dong (State Grid Information and Telecommunication Branch, China)</i>	
Improved Algorithm for Intra-Frame Prediction Based on AVS3 .....	242
<i>Minfeng Chen (Fuzhou University, China)</i>	
Integration Learning Oriented Click Anti-Fraud Prediction .....	246
<i>Hua-Xiong Liang (Beijing University of Information Technology, China) and Gang Zhao (Beijing University of Information Technology, China)</i>	
Research on Path Planning of Mobile Robot Based on Improved A-Star Algorithm .....	251
<i>Daibing Huang (Chongqing Three Gorges University, China), Yingjie Zhao (Chongqing Three Gorges University, China), Qirui Li (Chongqing Three Gorges University, China), and Tingfang Wu (Chongqing Three Gorges University, China)</i>	



**Author Index** ..... 257