

**2022 IEEE 9th International
Conference on Cyber Security
and Cloud Computing
(CSCloud 2022)/2022 IEEE 8th
International Conference on Edge
Computing and Scalable Cloud
(EdgeCom 2022)**

**Xi'an, China
25 – 27 June 2022**



**IEEE Catalog Number: CFP22C21-POD
ISBN: 978-1-6654-8067-3**

**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:	CFP22C21-POD
ISBN (Print-On-Demand):	978-1-6654-8067-3
ISBN (Online):	978-1-6654-8066-6
ISSN:	2693-8952

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

CURRAN ASSOCIATES INC.
proceedings
.com

2022 IEEE 9th International Conference on Cyber Security and Cloud Computing (CSCloud)/2022 IEEE 8th International Conference on Edge Computing and Scalable Cloud (EdgeCom) **CSCloud-EdgeCom 2022**

Table of Contents

Message from the General Chairs	xi
Message from the Program Chairs (CSCloud)	xii
Message from the Program Chairs (EdgeCom)	xiii
Committee Members (CSCloud)	xiv
Committee Members (EdgeCom)	xvii

CSCloud 1

Quantum Federated Learning: Remarks and Challenges	1
<i>Harashta Tatimma Larasati (Pusan National University, Republic of Korea; Institut Teknologi Bandung, Indonesia), Muhammad Firdaus (Pukyong National University, Republic of Korea), and Howon Kim (Pusan National University, Republic of Korea)</i>	
Recommendation System Design for Social Media using Reinforcement Learning	6
<i>Xiangyu Gao (New York University, USA) and Meikang Qiu (Texas A&M University Commerce, USA)</i>	
SemiCon: A Semi-Supervised Learning for Industrial Image Inspection	12
<i>Weitao Tang (Purdue University, USA), Tonglin Zhang (Purdue University, USA), and Baijian Yang (Purdue University, USA)</i>	
A Secure Federated Learning Framework using Blockchain and Differential Privacy	18
<i>Muhammad Firdaus (Pukyong National University, Republic of Korea), Harashta Tatimma Larasati (Pusan National University, Republic of Korea; School of Electrical Engineering and Informatics, Institut Teknologi Bandung, Indonesia), and Kyung-Hyune Rhee (Pukyong National University, Republic of Korea)</i>	

CSCloud 2

Current Status and Prospects of Blockchain Security Standardization	24
<i>Xiaofeng Chen (Hangzhou Qulian Technology Co., Ltd.; Zhejiang University, China), Zunbo Wei (Hangzhou Qulian Technology Co., Ltd., China), Xiangjuan Jia (Hangzhou Qulian Technology Co., Ltd., China), Peiyu Zheng (Hangzhou Qulian Technology Co., Ltd., China), Mengwei Han (Hangzhou Qulian Technology Co., Ltd., China), and Xiaohu Yang (Zhejiang University, China)</i>	
Standardization of Financial Blockchain: Technologies, Challenges, and Future	30
<i>Xiaofeng Chen (Hangzhou Qulian Technology Co., Ltd.; Zhejiang University, China), Qing Zhang (Hangzhou Qulian Technology Co., Ltd., China), Lu Zhang (Hangzhou Qulian Technology Co., Ltd., China), Xiangjuan Jia (Hangzhou Qulian Technology Co., Ltd., China), Peiyu Zheng (Hangzhou Qulian Technology Co., Ltd., China), and Xiaohu Yang (Zhejiang University, China)</i>	
A Fundamental Analysis of Standardization for Blockchain and Distributed Ledger Technologies in ISO	36
<i>Xiaofeng Chen (Zhejiang University; Hangzhou Qulian Technology Co., Ltd., China), Lu Zhang (Hangzhou Qulian Technology Co., Ltd., China), Yijian Zhang (Hangzhou Qulian Technology Co., Ltd., China), Jingyi Du (Hangzhou Qulian Technology Co., Ltd., China), Xiangjuan Jia (Hangzhou Qulian Technology Co., Ltd., China), and Xiaohu Yang (Zhejiang University, China)</i>	
Applications Oriented Technical Ecology for the Standardization of Blockchain in IEEE	43
<i>Xiaofeng Chen (Zhejiang University; Hangzhou Qulian Technology Co., Ltd., China), Xiangjuan Jia (Hangzhou Qulian Technology Co., Ltd., China), Jing Xu (Hangzhou Qulian Technology Co., Ltd., China), Lu Zhang (Hangzhou Qulian Technology Co., Ltd., China), Zunbo Wei (Hangzhou Qulian Technology Co., Ltd., China), and Xiaohu Yang (Zhejiang University, China)</i>	

CSCloud 3

Balance Multi-Head Attention Based on Software and Hardware Co-Design	50
<i>Dian Xu (Wuhan University of Science and Technology, China), Wei Hu (Wuhan University of Science and Technology, China), Fang Liu (Wuhan University, China), Zimeng Fan (Wuhan University of Science and Technology, China), and Qingsong Shi (Zhejiang University, China)</i>	
Low Energy Consumption and Time Deterministic Energy-Saving Workflow Task Scheduling Algorithm Based on DVFS	56
<i>Xun Liu (Hubei Province Key Laboratory of Intelligent Information Processing and Real-time Industrial System, China)</i>	
Graph-Based Malicious Account Groups Detection in Electronic Trading of Bulk Commodities	62
<i>Xiang Li (Shanghai Jiao Tong University, China), Yihao Li (Shanghai Jiao Tong University, China), and Ping Yi (Shanghai Jiao Tong University, China)</i>	

Energy-Efficient Communication Based on Multi-RIS and Sleep Strategy in Electric IoT	68
<i>Xian Luo (State Grid Hubei Electric Power Co., Ltd. Information and Communication Company, China), Weiran Wang (Wuhan University, China), Dai Zhang (State Grid Hubei Electric Power Co., Ltd. Information and Communication Company, China), Shengwei Wang (State Grid Hubei Electric Power Co., Ltd. Information and Communication Company, China), and Xiang Li (State Grid Hubei Electric Power Co., Ltd. Information and Communication Company, China)</i>	

CSCloud 4

A Secure and Decentralized Auditing Scheme for Cloud Ensuring Data Integrity and Fairness in Auditing	74
<i>Tariqul Islam (Syracuse University, USA), Kamrul Hasan (Tennessee State University, USA), Saheb Singh (Syracuse University, USA), and Joon S. Park (Syracuse University, USA)</i>	
Advanced Analysis of Email Sender Spoofing Attack and Related Security Problems	80
<i>Beiyuan Yu (Beihang University, China), Pan Li (Peking University, China), Jianwei Liu (Beihang University, China), Ziyu Zhou (Beihang University, China), Yiran Han (Beihang University, China), and Zongxiao Li (Beihang University, China)</i>	
ARC: An Asynchronous Consensus and Relay Chain-Based Cross-Chain Solution to Consortium Blockchain	86
<i>Shaobo Zhang (Beijing Institute of Technology, China), Tianxiu Xie (Beijing Institute of Technology, China), Keke Gai (Beijing Institute of Technology, China), and Lei Xu (Beijing Institute of Technology, China)</i>	
Neural Networks Implemented by Differential Evolutionary Algorithms to Counter Attacks	93
<i>Qingfeng Chen (Wuhan University of Science and Technology, China), Jing Wu (Wuhan University of Science and Technology, China), Jing Liu (Wuhan University of Science and Technology, China), and Yu Han (Wuhan University of Science and Technology, China)</i>	

CSCloud 5

Towards Small Scale Urban Fire Detection Dataset	99
<i>Sida Dai (China Telecom Research Institute, China), Tao Han (China Telecom Research Institute, China), Mingchuan Yang (China Telecom Research Institute, China), Yuan Zhang (Zhejiang University, China & China Telecom Research Institute, China), and Lichuan Wang (China Telecom Research Institute, China)</i>	
Prediction of Hard Drive Failures For Data Center Based on LightGBM	105
<i>Jun Zeng (Wuhan University. Fiberhome Communication Technology Co., Ltd, China), Ruixuan Ba (Wuhan University, China), Qimei Chen (Wuhan University, China), Lihua Wu (Wuhan Second Ship Design and Research Institute, China), Hao Wang (Wuhan Second Ship Design and Research Institute, China), and Yunfei Xiong (Fiberhome Communication Technology Co., Ltd, China)</i>	

Maximizing the Influence in Dynamic Social Networks: An Entropy-Based Linear Threshold Model	111
<i>Zekun Liu (Hunan University of Science and Technology; Hunan Key Laboratory for Service Computing and Novel Software Technology, China), Jianyong Yu (Hunan University of Science and Technology; Hunan Key Laboratory for Service Computing and Novel Software Technology, China), Yuqi Liu (Hunan University of Science and Technology; Hunan Key Laboratory for Service Computing and Novel Software Technology, China), and Hangyu Zhu (Guangdong Qilian Technology Co., Ltd, China)</i>	
One Novel Dynamic Entity Intelligent Inspection Technology of Bulk Commodity Trading Market	117
<i>Li Zhu (Xi'an University of Science and Technology, China), Gong Chen (Xian University of science and technology, China), and Zhanli Li (Xian University of science and technology, China)</i>	

CSCloud 6

Design of Shared Register File of GPU Unified Shader Array	123
<i>Ze Tian (Xi'an XiangTeng Micro-Electronic Technology Co., Ltd, China), Xianglong Ren (Xi'an XiangTeng Micro-Electronic Technology Co., Ltd, China), Jun Zhang (Xi'an XiangTeng Micro-Electronic Technology Co., Ltd, China), Feihu Fan (Xi'an XiangTeng Micro-Electronic Technology Co., Ltd, China), and Yue Chen (Northeastern Polytechnic University, China)</i>	
A Time Deterministic Dynamic Segmentation Scheduling Algorithm	129
<i>Haonan Gu (Wuhan University of Science and Technology, China), Jing Wu (Wuhan University of Science and Technology, China), and Yi Guo (Wuhan University of Science and Technology, China)</i>	
A Searchable Re-Encryption-Based Scheme for Massive Data Transactions	135
<i>Yang Yu (Beijing Institute of Technology, China), Rui Jin (Beijing Institute of Technology, China), Hao Yin (Beijing Institute of Technology, China), Keke Gai (Beijing Institute of Technology, China), and Zijian Zhang (Beijing Institute of Technology, China)</i>	
Graph-Based Algorithm For Self-Trading Accounts Detection in Bulk Commodity Trade	141
<i>Dongliang Guan (Shanghai Jiao Tong University, China), Sheng Liu (Shanghai Jiao Tong University, China), Yihao Li (Shanghai Jiao Tong University, China), and Ping Yi (Shanghai Jiao Tong University, China)</i>	
A Communication-Efficient Semi Asynchronous Federated Learning Network in Power Grid	147
<i>Xian Luo (State Grid Hubei Electric Power Co., Ltd. Information and Communication Company, China), Zehua You (Wuhan University, China), Rongtao Liao (State Grid Hubei Electric Power Co., Ltd. Information and Communication Company, China), Fen Liu (State Grid Hubei Electric Power Co., Ltd. Information and Communication Company, China), and Liang Dong (State Grid Hubei Electric Power Co., Ltd. Information and Communication Company, China)</i>	

EdgeCom 1

An Offloading Algorithm Based on Deep Reinforcement Learning for UAV-Aided Vehicular Edge Computing Networks	153
<i>Shuai Yuan (Beihang University), Hongbo Zhao (Beihang University), and Liwei Geng (Beihang University)</i>	
High-Speed Transcendental Function Operation Unit Design	160
<i>Ze Tian (Xi'an XiangTeng Micro-Electronic Technology Co., Ltd, China), Feihu Fan (Xi'an XiangTeng Micro-Electronic Technology Co., Ltd, China), Jun Zhang (Xi'an XiangTeng Micro-Electronic Technology Co., Ltd, China), Xianglong Ren (Xi'an XiangTeng Micro-Electronic Technology Co., Ltd, China), and Yang Wei (Northeastern Polytechnic University, China)</i>	
Low Resource Neural Machine Translation	166
<i>Zichun Wang (Nankai University, China)</i>	
Topic-Aware Popularity and Retweeter Prediction Model for Cascade Study	172
<i>Song Yang (People's Daily Online, China), Zheng Zhang (People's Daily Online, China), Hao Jiang (Wuhan University, China), Cong Zheng (Wuhan University, China), and Xiaoyue Zhao (Wuhan University, China)</i>	

EdgeCom 2

Speformer: An Efficient Hardware-Software Cooperative Solution for Sparse Spectral Transformer	180
<i>Yang Sun (Wuhan University of Science and Technology, China), Wei Hu (Wuhan University of Science and Technology, China), Fang Liu (Wuhan University, China), Min Jiang (Wuhan University of Science and Technology, China), Feihu Huang (Wuhan University of Science and Technology, China), and Dian Xu (Wuhan University of Science and Technology, China)</i>	
Prediction of the Impact of Mobile Payments on the Consumption of Individual Nodes on Communication Networks	186
<i>Xiangbin Kong (China United Network Communication Co., Ltd., Guangdong Branch, China), Xiuping Ouyang (China United Network Communication Co., Ltd. Guangdong Branch, China), Hao Li (Wuhan University, China), Min Lin (China United Network Communication Co., Ltd., Guangdong Branch, China), Xiang Chen (China United Network Communication Co., Ltd., Guangdong Branch, China), Juan Liao (China United Network Communication Co., Ltd., Guangdong Branch, China), Huifang Liu (China United Network Communication Co., Ltd., Guangdong Branch, China), and Bingqing Liu (Wuhan University, China)</i>	
A Lightweight and Secure Authentication Protocol for 5G mMTC	195
<i>Jiale Hu (Beihang University, China), Zongxiao Li (Beihang University, China), Peiran Li (Beihang University, China), and Jianwei Liu (Beihang University, China)</i>	

Survey of Shared Register File Design for Unified Shader Array in GPUs 201
*Ze Tian (Xi'an XiangTeng Micro-Electronic Technology Co., Ltd, China),
Jun Zhang (Xi'an XiangTeng Micro-Electronic Technology Co., Ltd,
China), Xianglong Ren (Xi'an XiangTeng Micro-Electronic Technology
Co., Ltd, China), Feihu Fan (Xi'an XiangTeng Micro-Electronic
Technology Co., Ltd, China), and Yue Chen (Northeastern Polytechnic
University, China)*

Author Index 207