2021 IEEE 6th International Conference on Smart Cloud (SmartCloud 2021)

Virtual Conference
6 – 8 November 2021

IEEE

IEEE Catalog Number: CFP21H64-POD
ISBN: 978-1-6654-4375-3

Copyright © 2021 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:	CFP21H64-POD
ISBN (Print-On-Demand):	978-1-6654-4375-3
ISBN (Online):	978-1-6654-4374-6

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

2021 IEEE 6th International Conference on Smart Cloud (SmartCloud)

SmartCloud 2021

Table of Contents

Message from the General Chairs ..... **ix**
Message from the Program Chairs ..... **x**
Committee Members ..... **xi**

SmartCloud 1

A Safety Vehicle Detection Mechanism Based on YOLOv5 1
Yeting Huang (Zhejiang Sci-Tech University, China) and Hancui Zhang (Zhejiang Sci-Tech University, China)

A Survey of Machine Learning-Based IoT Intrusion Detection Techniques 7
Jing Long (Hunan Normal University, China; Guilin University of Electronic Technology, China; Minjiang University, China), Fei Fang (Hunan Normal University, China), and Haibo Luo (Minjiang University, China)

SM9-Based Traceable and Accountable Access Control for Secure Multi-user Cloud Storage 13
Ke Ren (Beijing Institute of Technology, China), Peng Jiang (Beijing Institute of Technology, China), Keke Gai (Beijing Institute of Technology, China), Liehuang Zhu (Beijing Institute of Technology, China), and Jingjing Huang (China Electronics Standardization Institute, China)

A Blockchain-Assisted Privacy-Preserving Cloud Computing Method with Multiple Keys 19
Liangqun Huang (Beijing Institute of Technology, China), Lei Xu (Beijing Institute of Technology, China), Liehuang Zhu (Beijing Institute of Technology, China), and Keke Gai (Beijing Institute of Technology, China)

Research Study on Edge Computing 26
Jiapeng Li (Jingdezhen Ceramic University, China) and Hua Huang (Jingdezhen Ceramic University, China)

SmartCloud 2

Optimizing the Performance of Web Applications in Mobile Cloud Computing 33
Jatin Patel (University of Winnipeg, Canada) and Talal Halabi (University of Winnipeg, Canada)

A Token-Based Authentication and Key Agreement Protocol for Cloud Computing 38
Zisang Xu (Changsha University of Science and Technology, China), Jianbo Xu (Hunan University of Science and Technology, China), and Li-Dan Kuang (Changsha University of Science and Technology, China)

Unsupervised Learning Based Detection Method for The Life Cycle of Virtual Cryptocurrency 44
Tong Zhu (The Third Research Institute of The Ministry of Public Security, China), Ziyang Zhou (The Third Research Institute of The Ministry of Public Security, China), Chenyang Liao (The Third Research Institute of The Ministry of Public Security, China), Xinyu Li (The Third Research Institute of The Ministry of Public Security, China), and Qingfu Zhang (The Third Research Institute of The Ministry of Public Security, China)

PF_RING-TA: A Traffic-Adaptive Method of Packet Capturing by Enhancing PF_Ring 51
Jiawei Ye (Fudan University, China), Jiaqian Li (Fudan University, China), Ai Erpanjiang (Fudan University, China), and Chengrong Wu (Fudan University, China)

Time-To-Live Based Caching Mechanism with Nonlinear Pricing for Information-Centric Networks 57
Cheng Zhang (Ibaraki University, Japan)

SmartCloud 3

Research on the Application of Time and Space Prediction Method in Traffic Flow Prediction..... 61
Chunyan Diao (Hunan University, China), Dafang Zhang (Hunan University, China), Juan Chen (Hunan University, China), Yuting Tang (Hunan University, China), and Lijun Xiao (Guangzhou College of Technology and Business, China)

Hekate a tool for Gauging Data Deduplication Performance 67
Lars Nielsen (Aarhus University, Denmark) and Daniel E. Lucani (Aarhus University, Denmark)

FBLE: A Feature-Based Label Enhancement Method for Corporate Bond Credit Rating Prediction.... 73
Yingjie Liu (Peking University, China), Wenhui Hu (Peking University, China), DongDong Du (China Academy of Industrial Industrial Internet, China), Xueyang Liu (Peking University, China), Minghui Zhang (Peking University, China), and Yu Huang (Peking University, China)

A Resource Allocation Strategy for Edge Services Based on Intelligent Prediction 78
Yujie Wang (Fudan University, China), Xiaoli Wan (Zhejiang International Business Group, Co.Ltd, China), Xin Du (Fudan University, China), Xuzhao Chen (Fudan University, China), and Zhihui Lu (Fudan University, China)

Similarity Analysis of Knowledge Graph-Based Company Embedding for Stocks Portfolio 84
Boyao Zhang (Chinese Academy of Science, China; University of Chinese Academy of Sciences, China), Zhongrui Li (Beijing Jiaotong University, China), Chao Yang (Beijing University of Aeronautics and Astronautics, China), Zongguo Wang (Chinese Academy of Science, China), Yonghua Zhao (Chinese Academy of Science, China), Jingqi Sun (Beijing University of Aeronautics and Astronautics, China), and Lihua Wang (Beijing University of Aeronautics and Astronautics, China)

SmartCloud 4

A Case Study on Profiling of an EEG-Based Brain Decoding Interface on Cloud and Edge Servers 90
Alexandra Samsonova (Queen's University Belfast, UK), Barry J. Devereux (Queen's University Belfast, UK), Georgios Karakonstantis (Queen's University Belfast, UK), and Lev Mukhanov (Queen's University Belfast, UK)

T-PKI for Anonymous Attestation in TPM 96
Art Sedighi (Iowa State University), Doug Jacobson (Iowa State University), and Thomas Daniels (Iowa State University)

SG-CIM Mapping Entity Relationship Inference and Verification Techniques Based on Graph Representation Learning Technology 101
Yu Huang (Peking University, China), Wenhui Hu (Peking University, China), and Xueyang Liu (Peking University, China)

Optimizing the Uncertainty of PPM on Small Batch of Quality Data 107
Jun Wang (Harbin Institute of Technology, China), Chu Wang (Beijing Jinghang Computation and Communication Research Institute, China), Tong Zhang (Beijing Jinghang Computation and Communication Research Institute, China), and Xusheng Shi (Beijing Jinghang Computation and Communication Research Institute, China)

Deep Learning in Automatic Fingerprint Identification 111
Chunsheng Wu (Beijing Police College, China), Honghao Wu (Beijing Police College, China), Lei Song (Beijing Police College, China), Xiaojun Li (Institute of Forensic Science, MPS, China), and Hui Tong (Beijing Police College, China)

SmartCloud 5

Review on Service Composition 117
Fengtao Hu (Jingdezhen Ceramic Institute, China), Hua Huang (Jingdezhen Ceramic Institute, China), and Zhihan Guo (Jingdezhen Ceramic Institute, China)

Monitoring Solution for Cloud-Native DevSecOps 125
Arun Sojan (University of Oulu, Finland), Ranjit Rajan (Panasonic Europe, Germany), and Pasi Kuvaja (University of Oulu, Finland)

Game to Dethrone: A Least Privilege CTF 132
Wenjing Wu (Portland State University, USA) and Wu-Chang Feng (Portland State University, USA)

Cross-view Matching Neural Network for Remote Sensing Images 138
Tian Hui (Northwestern Polytechnical University, China), Xiaoqing Chen (National Innovation Institute of Defense, Technology Academy of Military Science, China), Ronggang Zhu (Luoyang Institute of Electro-Optical Equipment, China), YueLei Xu (Northwestern Polytechnical University, China), and Zhaoxiang Zhang (Northwestern Polytechnical University, China)

A Genetic Algorithm-Based Artificial Network Method for Material Feature Recombination 144
Jialong Guo (University of Chinese Academy of Sciences, China), Zhiwei Liu (University of Chinese Academy of Sciences, China), Zongguo Wang (University of Chinese Academy of Sciences, China), Yuhang Hu (Chongqing University, China), Jue Wang (University of Chinese Academy of Sciences, China), and Yangang Wang (University of Chinese Academy of Sciences, China)

Author Index **149**