2019 International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery (CyberC 2019)

Guilin, China 17 – 19 October 2019



IEEE Catalog Number: ISBN:

CFP1927I-POD 978-1-7281-2543-5

Copyright \odot 2019 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:
 CFP1927I-POD

 ISBN (Print-On-Demand):
 978-1-7281-2543-5

 ISBN (Online):
 978-1-7281-2542-8

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 Web: www.proceedings.com



2019 International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery (CyberC)

CyberC 2019

Table of Contents

Introduction	
Message from the Steering Committee Co-Chairs	
Message from the Technical Program Chairs	
Committees	
Reviewers	
Keynote Abstracts	xxii
Session 1: Blockchain Design and Applications	
A Survey on Range Proof and Its Applications on Blockchain	1
Accountable Data Sharing Scheme Based on Blockchain and SGX Yili Luo (Southwest Jiaotong University), Jia Fan (Science and Technology on Communication Security Lab), Chunhua Deng (Southwest Jiaotong University), Yixin Li (Southwest Jiaotong University), Yue Zheng (Southwest Jiaotong University), and Jianwei Ding (Science and Technology on Communication Security Lab)	9
An Extensible Consensus Algorithm Based on PBFT Yixin Li (Southwest Jiaotong University), Zhen Wang (Science and Technology on Communocation Security Lab), Jia Fan (Science and Technology on Communication Security Lab), Yue Zheng (Southwest Jiaotong University), Yili Luo (Southwest Jiaotong University), Chunhua Deng (Southwest Jiaotong University), and Jianwei Ding (Science and Technology on Communication Security Lab)	17
An Improved Gossip Algorithm Based on Semi-Distributed Blockchain Network	24
Analysis of Blockchain Technology for Higher Education	28

Basis Path Coverage Criteria for Smart Contract Application Testing	34
Blockchain-Based Privacy Protection Unified Identity Authentication Yue Zheng (Southwest Jiaotong University), Yarong Li (Science and Technology on Communication Security Lab), Zhen Wang (Science and Technology on Communication Security Lab), Chunhua Deng (Southwest Jiaotong University), Yili Luo (Southwest Jiaotong University), Yixin Li (Southwest Jiaotong University), and Jianwei Ding (Science and Technology on Communication Security Lab)	42
Record and Reward Federated Learning Contributions with Blockchain	50
Session 2: Security	
An Effective Differential Power Attack Method for Advanced Encryption Standard	58
An Encrypted Malicious Traffic Detection System Based on Neural Network Tangda Yu (Shanghai Jiao Tong University), FuTai Zou (Shanghai Jiao Tong University), Linsen Li (Shanghai Jiao Tong University), and Ping Yi (Shanghai Jiao Tong University)	62
Automatic XSS Detection and Automatic Anti-Anti-Virus Payload Generation Lin Li (School of Intelligent Systems Science and Engineering, Jinan University, Zhuhai, China) and Linfeng Wei (School of Cyber Security, Jinan University, Guangzhou, China)	71
Distributed Node Selection Algorithm for Physical Layer Security in D2D Network Weifeng Lu (Nanjing University of Posts and Telecommunications), Mingji Wang (Nanjing University of Posts and Telecommunications), Jia Xu (Nanjing University of Posts and Telecommunications), Siguang Chen (Nanjing University of Posts and Telecommunications), Lijun Yang (Nanjing University of Posts and Telecommunications), and Jian Xu (Nanjing University of Science and Technology)	77
Endpoint Protection: Measuring the Effectiveness of Remediation Technologies and Methodologies for Insider Threat Sonali Chandel (New York Institute of Technology), Sun Yu (New York Institute of Technology), Tang Yitian (New York Institute of Technology), Zhou Zhili (New York Institute of Technology), and Huang Yusheng (New York Institute of Technology)	81
Environment Aware Privacy-Preserving Authentication with Predictability for Medical Edge Computing Shuaipeng Zhang (East China Normal University) and Hong Liu (East China Normal University)	90

Hierarchical Key Management Scheme with Multilevel Secure Access
Trust Enhancement Scheme for Cross Domain Authentication of PKI System 10. Yuxiang Chen (Science and Technology on Communication Security Laboratory), Guishan Dong (China Electronics Technology Group Corporation), Jian Bai (Science and Technology on Communication Security Laboratory; China Electronics Technology Group Corporation), Yao Hao (Science and Technology on Communication Security Laboratory; China Electronics Technology Group Corporation), Feng Li (Science and Technology on Communication Security Laboratory), and Haiyang Peng (China Electronics Technology Group Corporation)
The Golden Shield Project of China: A Decade Later—An in-Depth Study of the Great Firewall
A Generic Construction of Puncturable Encryption
Session 3: Image and Video Processing
A New Method for Error Analysis of Binocular Stereo Vision System
Contrast Limited Adaptive Histogram Equalization for an Advanced Stereo Visual SLAM System
Info-Retrieval with Relevance Feedback using Hybrid Learning Scheme for RS Image
Cascaded Algorithm Representation for Purifying Face Dataset with Labeled Noise
Network Coding for Reliable Video Distribution in Device-to-Device Communications

Session 4: Big Data and Machine Learning

A Study of Online Function Approximation System Based on BP Neural Network Yaohui Jia (China Shipping Heavy Industry 713 Research Institute), Feng Chen (Zhengzhou University), Peng Wu (Zhengzhou University), Qiang Liu (Zhengzhou University), Yamin Chen (Zhengzhou University), and Yun Liu (Zhengzhou University)	147
A User Influence Rank Algorithm Based on Interaction Behaviors in Cyber Group Events	151
BDNE: A Method of Bi-Directional Distance Network Embedding	158
Face Recognition in Complex Lighting Environment	162
Forecast of the Tourist Volume of Sanya City by XGBoost Model and GM Model	166
Impact of Feature Selection Methods on Data Classification for IDS	174
Mixed Attribute Clustering Algorithm Based on Filtering Mechanism Wenxin Wang (Zhengzhou University) and Ruilin Zhang (Harbin Institute of Technology, Shenzhen)	181
Session 5: Blockchain Protocols	
Byzantine Fault Tolerant Algorithm Based on Vote	190
Cybersecurity and the Blockchain: Preventing the Insertion of Child Pornography Images	197

05
15
19
27
37
45
45 49

Drug Audit Based on Bisecting K-Means Clustering Algorithm	65
Slot Filling Using En-Training	71
Weather Analysis to Predict Rice Pest Using Neural Network and D-S Evidential Theory	77
Session 7: 5G and Wireless Communications	
A Greedy Approach for TDMA Based on Matrix Operation 23 Shuai xiaoying (Taizhou University)	84
High Precision Timing Based on Parabola Curve Fitting in Narrowband System	88
Near Field Beam Forming Characteristics of Conformal Antenna Arrays Shun-Ping Chen (Darmstadt University of Applied Sciences)	92
Oblique Projection Polarization Filter-Based Self-Interference Cancellation Scheme in In-Band Full-Duplex Systems	98
Research on Simultaneous Wireless Information and Power Transmission Based on OFDM for Space System . 30 Chunfeng Wang (Qian Xuesen Laboratory of Space Technology, China Academy of Space Technology) and Naijin Liu (Qian Xuesen Laboratory of Space Technology, China Academy of Space Technology)	04
The Future of Broadband Access Network Architecture and Intelligent Operations	08
A Dynamic Weighting Fusion Positioning Method Based on Opportunity Correction for INS and UWB	17
A Reliable Broadcast Algorithm with Multiple-Opportunity Acknowledgement in Internet of Vehicles	22
A CNN Approach of Activity Recognition via Channel State Information (CSI)	29

Session 8: Robot IOT Smart Sensor Networks

Detection of Anomalies in the Robotic System Based on the Calculation of Kullback-Leibler Divergence 337 Elena Basan (Southern Federal University Taganrog, Russia), Alexander Basan (Southern Federal University Taganrog, Russia), and Oleg Makarevich (Southern Federal University Taganrog, Russia)	7
Multi-UAV Formation Transformation Based on Improved Heuristically-Accelerated Reinforcement	
Learning	
Performance Analysis for Blockchain Driven Wireless IoT Systems Based on Tempo-Spatial Model	}
Power Attack and Evaluation on Elliptic Curve Cryptosystem in a Commercial Smart Card	ļ
Recognizing Fine-Grained Home Contexts Using Multiple Cognitive APIs)
Study of the Integration of Robot in Cyber-Physical Production Systems	7
The Lightweight System for UAV Cooperative Mission Planning Simulation	
Session 9: Optimization Theory and Applications	
Dynamic Ring Structure Based Target Localization Algorithm in Wireless Sensor Networks	5
Generalization of Quantum Strassen Theorem)

Program Slicing Method of LLVM IR Based on Information-Flow Analysis Yuxin Sun (Nanjing University of Posts and Telecommunications), Yingzhou Zhang (Nanjing University of Posts and Telecommunications), and Junyan Qian (Guilin University of Electronic Technology)	383
Risk-Based Attributed Access Control Modelling in a Health Platform: Results from Project CityZen	391
Supply-Demand Collaborative Energy Internet for Smart City: A Three-Stage Stackelberg Game Approach Zailong Zhang (Nanjing University of Posts and Telecommunications) and Zhiwei Chen (Nanjing University of Posts and Telecommunications)	399
The Diagnosis of Alzheimer's Disease Based on Enhanced Residual Neutral Network Mingchang Xu (Guilin University of Electronic Technology), Zhenbing Liu (Guilin University of Electronic Technology), Zimin Wang (Guilin University of Electronic Technology), Long Sun (Guilin University of Electronic Technology), and Zhibin Liang (Guilin University of Electronic Technology)	405
Tibetan Location Name Recognition Based on BiLSTM-CRF Model	412
Ultralightweight RFID Authentication Protocol Based on Permutation Matrix Encryption Tinghui Huang (Guilin University of Electronic Technology), Yong Ding (Guilin University of Electronic Technology), Zhen Wang (Guilin University of Electronic Technology), and Huijiao Wang (Guilin University of Electronic Technology)	417
A TSGP-Based Tip Search Optimization Algorithm Huifang Wang (Zhengzhou University) and Zhihong Zhang (Zhengzhou University)	424
Session 10: Big Data, Analytics, Quality and Performance	
NERD: Neural Network for Edict of Risky Data Streams Sandro Passarelli (Bundeswehr University Munich), Cem Gündogan (Bundeswehr University Munich), Lars Stiemert (Bundeswehr University Munich), Matthias Schopp (Bundeswehr University Munich), and Peter Hillmann (Bundeswehr University Munich)	428
Passenger Flow Prediction in Bus Transportation System using ARIMA Models with Big Data Yinna Ye (Xi'an Jiaotong-Liverpool University), Li Chen (Xi'an Jiaotong-Liverpool University), and Feng Xue (Xiongdi Shenzhen Emperor Technology Company)	436
Translational Bit-by-Bit Multi-bit Quantization for CRNN on Keyword Spotting	444
Vertical Stratification of Seawater in the Southern South China Sea in Winter Based on Cluster Analysis Chengchang Wan (Chinese Academy of Sciences; University of Chinese Academy of Sciences), Xinghui Cao (Chinese Academy of Sciences), and Wei Wu (Chinese Academy of Sciences)	452

Water Quality Prediction of Small Watershed Based on Wavelet Neural Network
Chuang Ma (Chongqing University of Posts and Telecommunications),
Linfeng Li (Chongqing University of Posts and Telecommunications), and
Daiqi Zhou (Chongqing University of Posts and Telecommunications)
Additional Papers
Lightweight EEG Classification Model based on EEG-sensor with Few Channels
Detecting Sensitive Information of Unstructured Text Using Convolutional Neural Network
Author Index