2020 IEEE International
Conference on Parallel &
Distributed Processing with
Applications, Big Data & Cloud
Computing, Sustainable
Computing & Communications,
Social Computing & Networking
(ISPA/BDCLOUD/SOCIALCOM/SUSTAINCOM 2020)

Exeter, United Kingdom 17 – 19 December 2020

Pages 1-761



**IEEE Catalog Number: ISBN:** 

CFP2052Z-POD 978-1-6654-3051-7

## Copyright © 2020 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:
 CFP2052Z-POD

 ISBN (Print-On-Demand):
 978-1-6654-3051-7

 ISBN (Online):
 978-1-6654-1485-2

#### **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



2020 IEEE Intl Conf on Parallel & Distributed Processing with Applications, Big Data & Cloud Computing, Sustainable Computing & Communications, Social Computing & Networking (ISPA/BDCloud/SocialCom/SustainCom)

## ISPA-BDCloud-SocialCom-SustainCom 2020

### **Table of Contents**

Message from ISPA 2020 General Chairs xxxv
Message from ISPA 2020 Program Chairs xxxvi
ISPA 2020 Organizing and Program Committees xxxvii
Message from BDCloud 2020 General Chairs xli
Message from BDCloud 2020 Program Chairs xlii
BDCloud 2020 Organizing and Program Committees xliii
Message from IUCC 2020 General Chairs xlvi
Message from IUCC 2020 Program Chairs xlvii
IUCC 2020 Organizing and Program Committees xlviii
Message from SocialCom 2020 General Chairs 1
Message from SocialCom 2020 Program Chairs 1i
SocialCom 2020 Organizing and Program Committees lii
Message from SustainCom 2020 General Chairs liv.
Message from SustainCom 2020 Program Chairs ly
SustainCom 2020 Organizing and Program Committees lvi
Message from AISys 2020 Workshop Chairs lix
Message from DSONAM 2020 Workshop Chairs 1x
Message from IoTBDH 2020 Workshop Chairs 1xi
Message from MLFuNet 2020 Workshop Chairs 1xii
Message from NGDN 2020 Workshop Chairs lxiii
Message from SMMA 2020 Symposium Chairs 1xiv
Sponsors lxv

# The 18th IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA 2020)

### Session ISPA 01: Parallel Computing and Data Storage I

Reinforced Keyphrase Generation with BERT-Based Sentence Scorer .1.  Rui Liu (University of Chinese Academy of Sciences; Institute of Information Engineering, Chinese Academy of Sciences), Zheng Lin (Institute of Information Engineering, Chinese Academy of Sciences), Peng Fu (Institute of Information Engineering, Chinese Academy of Sciences), and Weiping Wang (Institute of Information Engineering, Chinese Academy of Sciences)
SOG-Based Multi-Core LTL Model Checking 9.  Chiheb Ameur Abid Chiheb Ameur Abid (University of Carthage Tunis, Tunisia), Kaïs Klai Kaïs Klai (University Sorbonne Paris North France), Jaime Arias Jaime Arias (University Sorbonne Paris North France), and Hiba Ouni Hiba Oui (University Sorbonne Paris North France)
A Task Execution Framework Based on Aging Indicator and SARIMI 18.  Minghao Tang (Institute of Information Engineering, Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China),  Peng Zhang (Institute of Information Engineering, Chinese Academy of Sciences, China), Haoqi Sun (Institute of Information Engineering,  Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), and Lei Zhang (Institute of Information Engineering,  Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China)
Framework-Agnostic Optimization of Repeated Skewed Joins at Massive Scale .26
Parallel Computing and Optimization of Lattice Boltzmann Method Based on SW26010 Processor.34 Xiaoxiao Zhang (Shanghai University, China), Liangjun Wang (Information Office of Shanghai University, China), Xuesen Chu (National Supercomputing Center in Wuxi, China), Hu Ding (Shanghai Institute of Applied Mathematics and Mechanics, Shanghai University, China), and Wu Zhang (Shanghai Institute of Applied Mathematics and Mechanics, Shanghai University, China)
A Tile Assembly Model to Calculate Point-Multiplication on Conic Curves over Finite Field GF(2^n) .41
Yongnan Li (People's Public Security University of China, China)

### Session ISPA 02: Parallel Computing and Data Storage II

Evaluating DAG Scheduling Algorithms for Maximum Parallelism 49.

Wei Zheng (Xiamen University, China), Zhaobin Chen (Xiamen University,
China), Rizos Sakellariou (The University of Manchester, United
Kingdom), Lu Tang (Chinese University of Hong Kong, China), and Jinjun
Chen (Swinburne University of Technology, Australia)

Discrete Sine and Cosine Transform and Helmholtz Equation Solver on GPU .57
CuCodeML: GPU-Accelerated CodeML for the Branch-Site Model in Phylogenetics .67
Ptlbmalloc2: Reducing TLB Shootdowns with High Memory Efficiency .76
Dependent and Heterogeneous Process Migration Based on Checkpoints .84
A Unified Page Walk Buffer and Page Walk Cache .93.  Dunbo Zhang (National University of Defense Technology, China),  Changyang Jia (National University of Defense Technology, China),  Qiong Wang (National University of Defense Technology, China), and Li  Shen (National University of Defense Technology, China)
Live Container Migration via Pre-Restore and Random Access Memory .102.  Zhixing Yu (South China University of Technology, China), Kejing He (South China University of Technology, China), Chao Chen (South China University of Technology, China), and Jian Wang (South China University of Technology, China)

### Session ISPA 03: Accelerating Deep Neural Networks

A Fast Robustness Quantification Method for Evaluating Typical Deep Learning Models by

DLFusion: An Auto-Tuning Compiler for Layer Fusion on Deep Neural Network Accelerator .118.  Zihan Liu (Emerging Parallel Computing Center, Shanghai Jiao Tong University, China), Jingwen Leng (Emerging Parallel Computing Center, Shanghai Jiao Tong University, China), Quan Chen (Emerging Parallel Computing Center, Shanghai Jiao Tong University, China), Chao Li (Emerging Parallel Computing Center, Shanghai Jiao Tong University, China), Wenli Zheng (Emerging Parallel Computing Center, Shanghai Jiao Tong University, China), Li Li (Emerging Parallel Computing Center, Shanghai Jiao Tong University, China), and Minyi Guo (Emerging Parallel Computing Center, Shanghai Jiao Tong University, China)
Parallel Variational Autoencoders for Multiple Responses Generation .128.  Miaojin Li (University of Chinese Academy of Sciences, China; Institute of Information Engineering, Chinese Academy of Sciences, China), Peng Fu (Institute of Information Engineering, Chinese Academy of Sciences, China), Zheng Lin (Institute of Information Engineering, Chinese Academy of Sciences, China), and Weiping Wang (Institute of Information Engineering, Chinese Academy of Sciences, China)
Characterizing the I/O Pipeline in the Deployment of CNNs on Commercial Accelerators .137  Jiansong Li (Institute of Computing Technology, CAS; University of Chinese Academy of Sciences), Zihan Jiang (Institute of Computing Technology, CAS; University of Chinese Academy of Sciences), Fangxin Liu (Nankai University), Xiao Dong (Institute of Computing Technology, CAS; University of Chinese Academy of Sciences), Guangli Li (Institute of Computing Technology, CAS; University of Chinese Academy of Sciences), Xueying Wang (Institute of Computing Technology, CAS; University of Chinese Academy of Sciences), Wei Cao (Institute of Computing Technology, CAS), Lei Liu (Institute of Computing Technology, CAS), Yanzhi Wang (Northeastern University), Tao Li (Nankai University; Institute of Computing Technology, CAS), and Xiaobing Feng (Institute of Computing Technology, CAS; University of Chinese Academy of Sciences)
DCDFNE: Build Dataset to Evaluate Binary Codes Diffing Tools and Train Deep Learning Models .145
APENAS:An Asynchronous Parallel Evolution Based Multi-Objective Neural Architecture Search.153 Mengtao Hu (East China Normal University, China), Li Liu (East China Normal University, China), Wei Wang (East China Normal University, China), and Yao Liu (East China Normal University, China)
FPGA Implementation of MobileNetV2 CNN Model Using Semi-Streaming Architecture for Low Power Inference Applications .160

## Session ISPA 04: Multi-access Edge Computing and Edge Networks

Caching Resource Allocation and Mobility Aware in Information-Centric Networking with Mobile Edge Computing 168
Towards 6G Joint HAPS-MEC-Cloud 3C Resource Allocation for Delay-Aware Computation Offloading .175
PCRec: A Private Coding Computation Scheme Based on Edge Computing for Recommendation System 183.
Mengjia Zhai (Soochow University, China), Fei Gu (Soochow University, China), Jin Wang (Soochow University, China), Lingzhi Li (Soochow University, China), Kejie Lu (University of Puerto Rico at Mayaguez), and Jianping Wang (City University of Hong Kong, China)
MCSEC: Secure Coded Matrix Multiplication Scheme for Edge Computing with Minimum Communication Cost .192
A Deep Reinforcement Learning Based Mobile Device Task Offloading Algorithm in MEC .200 Yang Li (Wuhan University of Technology, China) and Bing Shi (Wuhan University of Technology, China)
SDWCM: A Software-Defined Wi-Fi Architecture for Collaborative Management .208
Session ISPA 05: Cloud Computing Infrastructure and Applications
Cost-Efficient Request Dispatching in Geo-Distributed Cloud Gaming Infrastructure .218

A New Paradigm of Cloud Brokerage .228.

Sreekrishnan Venkateswaran (IBM Corporation) and Santonu Sarkar (BITS

Pilani, K K Birla Goa Campus)

(Shanghai Jiao of Technology China), Guan	tive Composite Matching Framework for Content-Based Pub/Sub Systems .236 g (Shanghai Jiao Tong University, China), Shiyou Qian Tong University, China), Weidong Zhu (Xuzhou University China), Jian Cao (Shanghai Jiao Tong University, gtao Xue (Shanghai Jiao Tong University, China), Yanmin i Jiao Tong University, China), and Wenjuan Li (Hangzhou rsity, China)
Xu Zhang (N Univerisity), University), T	e Largest Live Game Streaming Platform via Black-Box Measurement .244 mjing University; University of Exeter), Kai Yang (Nanjing Rongqi Zhang (Nanjing University), Qilin Fan (Chongqing long Tang (Sun Yatsen University; Guangzhou Institute of h), and Zhan Ma (Nanjing University)
Yiping Teng ( Aerospace Un University, C Haigang Liu (	xtual Skyline Queries on Cloud Platform .251
Zan Zong (Ts China), Xiao University, C	rds Fast Scaling of Distributed Streaming Dataflows .260
Session ISI	'A 06: Blockchain and Data Sharing
TSSN: A Trustec Shuokang Hu (ICNLAB, Pe Technology, C University, P.	A 06: Blockchain and Data Sharing  Shared Storage Network Based on Blockchain and Bilateral Matching .269  Ing (ICNLAB, Peking University, P.R. China), Maoyu Du  Ing University, P.R. China), Wei Li (Hangzhou Qulian  O. Ltd., P.R. China), and Kai Lei (ICNLAB, Peking  R. China; PCL Research Center of Networks and  Ins., Peng Cheng Laboratory, P.R. China)
TSSN: A Trusted Shuokang Hu (ICNLAB, Per Technology, C University, Pr Communication Blockchain-Based Yan Ding (National University of University of University of University of	Shared Storage Network Based on Blockchain and Bilateral Matching .269 Ing (ICNLAB, Peking University, P.R. China), Maoyu Du Ing University, P.R. China), Wei Li (Hangzhou Qulian o. Ltd., P.R. China), and Kai Lei (ICNLAB, Peking R. China; PCL Research Center of Networks and
TSSN: A Trusted Shuokang Hu (ICNLAB, Pel Technology, C University, P. Communication Blockchain-Base Yan Ding (National University of University of University of University of University of Multi-Layer Acception 12 (Normal University On Multi-Layer Acception 13 (Normal University On	Shared Storage Network Based on Blockchain and Bilateral Matching .269

#### An Systematic Study on Blockchain Transaction Databases Storage and Optimization .298......

Jingyu Zhang (Changsha University of Science & Technology, China; National University of Defense Technology, China), Siqi Zhong (Changsha University of Science & Technology, China), Jin Wang (Changsha University of Science & Technology, China; Fujian University of Technology, China), and Lei Wang (Changsha University of Science &

#### Revisiting the Fairness and Randomness of Delegated Proof of Stake Consensus Algorithm .305....

Qi Wang (East China Normal University, China; WanXiang Blockchain Lab, China), Ming Xu (East China Normal University, China), Xiangxue Li (East China Normal University, China; Shanghai Key Laboratory of Trustworthy Computing, China; Westone Cryptologic Research Center, China), and Haifeng Qian (East China Normal University, China)

### Session ISPA 07: Security and Reliability I

Technology, China)

Privacy Preserving Trajectory Data Publishing with Personalized Differential Privacy .313.....

Ruxue Wen (Internet Technology and Engineering R&D Center (ITEC), Huazhong University of Science and Technology, China), Wenqing Cheng (Internet Technology and Engineering R&D Center (ITEC), Huazhong University of Science and Technology, China), Haojun Huang (Internet Technology and Engineering R&D Center (ITEC), Huazhong University of Science and Technology, China), Wang Miao (University of Exeter, UK), and Chen Wang (Internet Technology and Engineering R&D Center (ITEC), Huazhong University of Science and Technology, China)

#### Constructing Optimal Sparse Decision Tree for Analying I-SIG System Attack .321.....

Xiaojin Wang (Beijing Jiaotong University, China), Yingxiao Xiang (Beijing Jiaotong University, China), Wenjia Niu (Beijing Jiaotong University, China), Endong Tong (Beijing Jiaotong University, China), Qi Alfred Chen (Division of Computer Science and Engineering, University of Michigan, American), Gang Li (Deakin University, Geelong Australia Centre for Cyber Security Research and Innovation Geelong, Australin), Jiqiang Liu (Beijing Jiaotong University, China), and Long Li (Guilin University of Electronic Technology, China)

## Fusion-Based Spammer Detection Method by Embedding Review Texts and Weak Social Relations .... 329

Jie Wen (University of Chinese Academy of Sciences, Beijing, China; Chinese Academy of Sciences, Beijing, China), Jingyuan Hu (Chinese Academy of Sciences Beijing, China), Hongbin Shi (Chinese Academy of Sciences Beijing, China), Xin Wang (Chinese Academy of Sciences Beijing, China), Chunyuan Yuan (University of Chinese Academy of Sciences, Beijing, China; China; Chinese Academy of Sciences, Beijing, China)

## AVDHRAM: Automated Vulnerability Detection Based on Hierarchical Representation and Attention Mechanism .337.

Wenyan An (Institute of Information Engineering, China; University of Chinese Academy of Sciences, China), Liwei Chen (Institute of Information Engineering, China; University of Chinese Academy of Sciences, China), Jinxin Wang (Institute of Semiconductors, China; UCAS, China), Gewangzi Du (Institute of Information Engineering, China; University of Chinese Academy of Sciences, China), Gang Shi (Institute of Information Engineering, China; University of Chinese Academy of Sciences, China), and Dan Meng (Institute of Information Engineering, China; University of Chinese Academy of Sciences, China)

#### Secure Deduplication Method Based on Autoencoder 345.

Hui Qi (Changchun University of Science and Technology, China), Tianwei Lu (Changchun University of Science and Technology, China), Ligang Cong (Changchun University of Science and Technology, China), and Xiaoqiang Di (Changchun University of Science and Technology, China)

#### Toward Automatic Mobile Application Fingerprint Extraction from Non-Encrypted HTTP Traffic,353

Yafei Sang (IIE, CAS, China; National Engineering Laboratory for Information Security Technologies, China), Yan Xu (IIE, CAS, China; National Engineering Laboratory for Information Security Technologies, China), Yongzheng Zhang (IIE, CAS, China; National Engineering Laboratory for Information Security Technologies, China), Peng Chang (IIE, CAS, China; National Engineering Laboratory for Information Security Technologies, China), Shuyuan Zhao (IIE, CAS, China; National Engineering Laboratory for Information Security Technologies, China), and Yijing Wang (IIE, CAS, China; National Engineering Laboratory for Information Security Technologies, China)

### Session ISPA 08: Security and Reliability II

## Analysis of Security Methods in Vehicular Ad-Hoc Network against Worm Hole and Gray Hole Attacks 371.....

Krzysztof Stepień (Institute of Information Technology, Lodz University of Technology, Poland) and Aneta Poniszewska-Marańda (Institute of Information Technology, Lodz University of Technology, Poland)

#### Hardware Implementation of Security Association Lookup Device Based on RAM .379.....

Dongfang Li (Beijing Institute of Computer Technology and Applications, China), Yasha Chen (Systems Engineering Institute, Academy of Military Science, China), Shuai Zhang (Beijing Institute of Computer Technology and Applications, China), Wei Shen (Beijing Institute of Computer Technology and Applications, China), and Guang Yang (Beijing Institute of Computer Technology and Application, China)

Low-Rate DoS Attack Detection Based on WPD-EE Algorithm 384.  Xiaocai Wang (Hunan University, China), Qiuwei Yang (Hunan University, China), Zichao Xie (Hunan University, China), Zhiqing Zheng (Hunan University, China), Yudong Yan (Hunan University, China), and Dan Tang (Hunan University, China)	
ASPGen: an Automatic Security Policy Generating Framework for AppArmor .392	•••
A Simulation-Based Study on the Reliability of Data Center Upgrades .401.  Yichuan Qi (Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, China), Dan Feng (Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, China), Binbing Hou (LinkedIn Inc., USA), Fang Wang (Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, China), Jianxi Chen (Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, China), and Yun Liu (Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, China)	•••
IntruDTS: Interactive Visual Analysis System for Intrusion Detection in Time Series .409	••
Session ISPA 09: Learning Systems and Applications	
Improved Human Activity Recognition Model Based on Sequence Mixup .417.  Ran Tan (Nanjing University of Aeronautics and Astronautics, China)  and Xuefeng Yan (Nanjing University of Aeronautics and Astronautics, China)	••
An Ego Network Embedding Model via Neighbors Sampling and Self-Attention Mechanism .42 Ziyu Guo (Shandong University, China), Shijun Liu (Shandong University, China), Li Pan (Shandong University, China), and Qiang He (Swinburne University of Technology, China)	<u>5</u>
User Preference Excitation Network for Sequential Recommendation .433.  Jiong Wang (Institute of Information Engineering, Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China),  Yingshuai Kou (Institute of Information Engineering, Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China),  Neng Gao (Institute of Information Engineering, Chinese Academy of Sciences, China), and Chenyang Tu (Institute of Information Engineering, Chinese Academy of Sciences, China)	•••

Remote Procedure Call Optimization of Big Data Systems Based on Data Awareness .441  Jin Wang (Changsha University of Science & Technology, China; Fujian  University of Technology, China), Yaqiong Yang (Changsha University of  Science & Technology, China), Jingyu Zhang (Changsha University of  Science & Technology, China; National University of Defense  Technology, China), and Lei Wang (Changsha University of Science &  Technology, China)
Feature Envy Detection Based on Bi-LSTM with Self-Attention Mechanism .448.  Hongze Wang (East China Normal University, Shanghai, China), Jing Liu (East China Normal University, Shanghai, China), JieXiang Kang (China Aeronautical Radio Electronics Research Institute, Shanghai, China), Wei Yin (China Aeronautical Radio Electronics Research Institute, Shanghai, China), Haiying Sun (East China Normal University, Shanghai, China), and Hui Wang (China Aeronautical Radio Electronics Research Institute, Shanghai, China)
Global Context-Aware Representation for Implicit Discourse Relation Recognition .458
Honeyeye: A Network Traffic Collection Framework for Distributed ICS Honeynets .466

### Session ISPA 10: Graph Neural Networks and Graph Algorithms

Multi-Relational Graph Convolutional Networks for Skeleton-Based Action Recognition .47.4.......

Fang Liu (Northeastern University, China; Shenyang Aerospace
University, China), Qin Dai (Shenyang Institute of Engineering,
China), Shengze Wang (Shenyang Aerospace University, China), Liang
Zhao (Shenyang Aerospace University, China), Xiangbin Shi (Shenyang
Aerospace University, China), and Jianzhong Qiao (Northeastern
University, China)

NarGNN: Narrative Graph Neural Networks for New Script Event Prediction Problem .481	
Social Recommendation Based on Graph Neural Networks .489	
Effectively Refining Parameters for Unexpected Nodes on Structural Graph Clustering .497	
Effectively Explaining Missing Nodes on Structural Graph Clustering .505.  Xiufeng Xia (Shenyang Aerospace University, China), Jida Min (Shenyang Aerospace University, China), Chuanyu Zong (Shenyang Aerospace University, China), Jiajia Li (Shenyang Aerospace University, China), Xiangyu Liu (Shenyang Aerospace University, China), and Tao Qiu (Shenyang Aerospace University, China)	
A Span-Based Model for Joint Entity and Relation Extraction with Relational Graphs .513	
Answer Graph-Based Interactive Attention Network for Question Answering over Knowledge Base .521	
Effectively Incremental Structural Graph Clustering for Dynamic Parameter .529	

## Session ISPA 11: Intelligent Algorithms and Optimization

An	Improved Sparrow Search Algorithm .537.
	Wei Song (Xi'an Jiaotong University, China), Song Liu (Xi'an Jiaotong University, China), Xiaochun Wang (Xi'an Jiaotong University, China), and Weiguo Wu (Xi'an Jiaotong University, China)
	Schly Efficient and GPU-Friendly Implementation of BFS on Single-Node System .544
	-CO: A Two-Step Spelling Correction Model for Combating Adversarial Typos .554
	nt Extraction of Triple Knowledge Based on Relation Priority .562.  Chuanzhi Zhuang (Institute of Computing Technology, The CAS;  University of Chinese Academy of Sciences), Ningyu Zhang (Zhejiang  University; AZFT Joint Lab for Knowledge Engine), Xiaolong Jin  (Institute of Computing Technology, The CAS; University of Chinese  Academy of Sciences), Zhong Li (Institute of Computing Technology, The  CAS; University of Chinese Academy of Sciences), Shumin Deng (Zhejiang  University; AZFT Joint Lab for Knowledge Engine), and Huajun Chen  (Zhejiang University; AZFT Joint Lab for Knowledge Engine)
	Simple Function Embedding Approach for Binary Similarity Detection .570
	timizing 3-D Placement of Multiple UAVs Based on Taguchi's Method .578

## Session ISPA 12: Recommendation, Planning, and Prediction

A Recommendation Algorithm for Sparse Data via Implicit Relationship .586	
A Hybrid Recommendation Algorithm with Short-Term Preference and Knowledge Preference Jia-le Li (Inner Mongolia University, China), Zhi-juan Du (Inner Mongolia University, China), and Jian-tao Zhou (Inner Mongolia University, China)	.593
A Web API Recommendation Method with Composition Relationship Based on GCN .601  Yangqi Zhang (Central South University, China), Haiyang Yang (Central  South University, China), and Li Kuang (Central South University,  China)	••••
A UAV Path and Action Planning Algorithm for Indoor Localization Information Collection .609 Zijie Wang (Nanjing University of Aeronautics and Astronautics, China), Liang Liu (Nanjing University of Aeronautics and Astronautics, China), Jiankang Xu (Nanjing University of Aeronautics and Astronautics, China), and Li Zeng (Nanjing University of Aeronautics and Astronautics, China)	<b>.</b>
Efficient Multi-Request Route Planning on Road Network .617	
An Efficient Dynamic Neural Network for Predicting Time Series Data Stream .625	••••
Predicting Residual Stress by Finding Peak Shape Using Artificial Neural Networks .633  Liu Yang (Central South University, China), Junyu Zhang (Central South University, China), Tingxuan Chen (Central South University, China), Wuji Lei (Central South University, China), and Xiaolong Liu (China Institute of Atomic Energy, China)	
Session ISPA 13: Scheduling and Load Balancing	
Task Merging Based on Scenarios of Functionally Unique Resources for Deadline-Constrained Workflow Scheduling .641	
APCC: Agile and Precise Congestion Control in Datacenters .649.  Renjie Zhou (National University of Defense Technology, China), Guoyuan Yuan (National University of Defense Technology, China), Dezun Dong (National University of Defense Technology, China), and Shan Huang (National University of Defense Technology, China)	••••
NVMCache: Wear-Aware Load Balancing NVM-Based Caching for Large-Scale Storage Systems Zhenhua Cai (Sun Yat-Sen University, China), Jiayun Lin (Sun Yat-Sen University, China), Fang Liu (Sun Yat-Sen University, China), Zhiguang Chen (Yat-Sen University, China), and Honotao Li (CNNIC, China)	.657

Resource Scheduling Algorithm on Mobile P2P Distribution Networks .666  Doudou Wang (Beijing University of Posts and Telecommunications, China), Xin Hu (Beijing University of Posts and Telecommunications, China), Quan Xue (YoMob Technology, China), Ze Li (Microsoft Azure, Microsoft, Redmond, United States), Lexi Xu (China United Network Communications Corporation, China), and Weidong Wang (Beijing University of Posts and Telecommunications, China)
A Novel Influence Maximization-Based Dynamic Forwarding Node Selection Scheme in SDVNs .67-Liang Zhao (Shenyang Aerospace University, PR China; Fujian Normal University, PR China), Tong Zheng (Shenyang Aerospace University, PR China), Mingwei Lin (Fujian Normal University, PR China), Ammar Hawbani (University of Science and Technology of China, PR China), and Jiaxing Shang (Chongqing University, PR China)
Performance Modeling of a General GPS Scheduling under Long Range Dependent Traffic .683  Ran Zhang (Shandong University), Lei Liu (Shandong University), Xudong  Lu (Shandong University), Zhongmin Yan (Shandong University), and Hui  Li (Shandong University)
Game-Based Negotiation between Power Demand and Supply in Green Datacenters .690
(IRIT, University of Toulouse, France)
Special Session: Crowd Science
Special Session: Crowd Science  Multi-Interest Aware Recommendation in CrowdIntell Network .698  Yixin Zhang (Shandong University, China; Joint SDU-NTU Centre for Artificial Intelligence Research (C-FAIR), China), Wei He (Shandong University, China; Joint SDU-NTU Centre for Artificial Intelligence Research (C-FAIR), China), Lizhen Cui (Shandong University, China; Joint SDU-NTU Centre for Artificial Intelligence Research (C-FAIR), China), Lei Liu (Shandong University, China; Joint SDU-NTU Centre for Artificial Intelligence Research (C-FAIR), China), and Zhongmin Yan (Shandong University, China; Joint SDU-NTU Centre for Artificial

## Crowd Intelligence Empowered Video Transmission in Ultra-Low-Bandwidth Constrained Circumstances .721

Hexiang Qiao (Institute of Computing Technology, Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Zheming Yang (Institute of Computing Technology, Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Bing Liang (Institute of Computing Technology, Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China; Peng Cheng Laboratory, China)

## Understanding Crowd Intelligence in Large-Scale Systems: A Hierarchical Binary Particle Swarm Optimization Approach .728.

Linqing Zhai (Institute of Computing Technology, Chinese Academy of Sciences University of Chinese Academy of Sciences, China), Zheming Yang (Institute of Computing Technology, Chinese Academy of Sciences University of Chinese Academy of Sciences, China), and Wen Ji (Institute of Computing Technology, Chinese Academy of Sciences, China)

# The 10th IEEE International Conference on Big Data and Cloud Computing (BDCloud 2020)

### Session BDCloud: Big Data and Cloud Computing

#### Cloud - Edge Offloading Model for Vehicular Traffic Analysis .746.....

Dragi Kimovski (University of Klagnefurt, Austria), Dijana C.
Bogatinoska (University of Information Science and Technology "St. Paul the Apostle", North Macedonia), Narges Mehran (University of Klagnefurt, Austria), Aleksandar Karadimce (University of Information Science and Technology "St. Paul the Apostle", North Macedonia), Natasa Paunkoska (University of Information Science and Technology "St. Paul the Apostle", North Macedonia), Radu Prodan (Klagenfurt University, Austria), and Ninoslav Marina (University of Information Science and Technology "St. Paul the Apostle", North Macedonia)

#### Blockchain and Homomorphic Encryption for Digital Copyright Protection .754.....

Wenyue Sun (Shanghai University, China), Haokun Fang (Shanghai University, China), Shensheng Zheng (Shanghai University, China), and Quan Qian (Shanghai University, China; Materials Genome Institute, Shanghai University, China)

#### Hemp Disease Detection and Classification Using Machine Learning and Deep Learning 7.62......

Bipasa Bose (San Jose State University, USA), Jyotsna Priya (San Jose State University, USA), Sonam Welekar (San Jose State University, USA), and Zeyu Gao (San Jose State University, USA)

A Neural Attentive Model Using Human Semantic Knowledge for Clickbait Detection .77.0
Automatic Road Detection in Traffic Videos 77.7.  Hadi Ghahremannezhad (New Jersey Institute of Technology, New Jersey),  Hang Shi (New Jersey Institute of Technology, New Jersey), and  Chengjun Liu (New Jersey Institute of Technology, New Jersey)
Energy-Aware Multimedia Applications Scheduling on VFI-NoC-MPSoC using as an Edge-Device in IoT .785
The 13th IEEE International Symposium on Social Computing and Networking (SocialCom 2020)
Session SocialCom 01: Social Network Analysis and Applications
Identifying the Right Person in Social Networks with Double Metaphone Codes .794
Matching User Accounts across Large-Scale Social Networks Based on Locality-Sensitive Hashing .802  Yongjun Li (Northwestern Polytechnical University, China), Xiangyu Li (Northwestern Polytechnical University, China), Jiaqi Yang (Northwestern Polytechnical University, China), and Congjie Gao (Northwestern Polytechnical University, China)
An Analysis of Twitter Responses to the 2019 Ridgecrest Earthquake Sequence .810
Music Social Tags Representation in Dimensional Emotion Models .819
Identifying Panic Triggers from Disaster-Related Tweets .827

## Session SocialCom 02: Computational Social Systems for Smart City

Exploring the Usage of Online Food Delivery Data for Intra-Urban Job and Housing Mobility Detection and Characterization 837
Practical Strategy of Acquaintance Immunization without Contact Tracing .845.  Zhihao Dong (Memorial University of Newfoundland, St. John's, Canada),  Yuanzhu Chen (Memorial University of Newfoundland, St. John's,  Canada), Terrence S. Tricco (Verafin Inc.; Memorial University of  Newfoundland, St. John's, Canada), Cheng Li (Memorial University of  Newfoundland, St. John's, Canada), and Ting Hu (Queen's University,  Kingston, Canada)
Analyzing Societal Impact of COVID-19: A Study during the Early Days of the Pandemic .852 Swaroop Gowdra Shanthakumar (SUNY Binghamton, USA), Anand Seetharam (SUNY Binghamton, USA), and Arti Ramesh (SUNY Binghamton, USA)
Hyper-Casual Endless Game Based Dynamic Difficulty Adjustment System for Players Replay Ability .860
Monitoring the Perception of Covid-19 Vaccine using Topic Models .867.  Swapna Gokhale (Computer Science & Engg., University of Connecticut, Storrs, CT)
Session SocialCom 03: Human-Centered Computing and Systems
A Cluster-Based Solution to Achieve Fairness in Federated Learning .875.  Fengpan Zhao (Georgia State University, USA), Yan Huang (Kennesaw State University, USA), Akshita Maradapu Vera Venkata Sai (Georgia State University, USA), and Yubao Wu (Georgia State University, USA)
Low-Light Image Enhancement Based on Joint Decomposition and Denoising U-Net Network .883 Jiawei Deng (Guilin University of Electronic Technology, China), Guangyao Pang (Wuzhou University, China), Li Wanb (Wuzhou University, China), and Zhenming Yua (Guilin University of Electronic Technology, China; Wuzhou University, China)
Adherent Nuclei Edge Detection Based on Caps-Unet .889  Yuli Chen (Shaanxi Normal University, China; Case Western Reserve University, USA), Xingwei Li (Shaanxi Normal University, China), Huiting Yao (Shaanxi Normal University, China), Xue Li (Shaanxi Normal University, China), Miao Ma (Shaanxi Normal University, China), Zhao Pei (Shaanxi Normal University, China), and Cheng Lu (Shaanxi Normal University, China)

#### Displacement Detection Method of QR Code Reference Object Based on Computer Vision .895......

Qiuhui Yang (Wuzhou University, China), Xiaoyu Ji (Wuzhou University, China; Macau University of Science and Technology, China), and Yanyan Liang (Macau University of Science and Technology, China; Beijing Institute of Technology, China)

#### A Multi-Granularity Targeted Covert Collection Scheme for Internet Data .901.....

Yi Meng (Northwest University, China; China Academy of Electronics and Information Technology of CETC, China), Yangyang Li (China Academy of Electronics and Information Technology of CETC, China), Yashen Wang (China Academy of Electronics and Information Technology of CETC, China), Hao Jin (China Academy of Electronics and Information Technology of CETC, China), Chun Wei (Northwest University, China), and Xiaoyan Yin (Northwest University, China)

#### Resource Allocation Optimization with Guaranteed Security Level for Anti-Traceable Access .909.

Bo Jin (Northwest University, China; China Academy of Electronics and Information Technology of CETC, China), Hao Jin (China Academy of Electronics and Information Technology of CETC, China), Yashen Wang (China Academy of Electronics and Information Technology of CETC, China), Yangyang Li (China Academy of Electronics and Information Technology of CETC, China), Xi Luo (Northwest University, China), Xiaoqing Gong (Northwest University, China), and Xiaoyan Yin (Northwest University, China)

# The 10th IEEE International Conference on Sustainable Computing and Communications (SustainCom 2020)

### Session SustainCom: Sustainable Computing and Communications

Spatial-Domain Resource Scheduling for Wireless Computing and Energy Provision in Energy Self-Sustainable F-RAN .917.

Jie Hu (University of Electronic Science and Technology of China,

Jie Hu (University of Electronic Science and Technology of China, China), Tingyu Shui (University of Electronic Science and Technology of China, China), Wei Zhang (University of Electronic Science and Technology of China, China), Fan Wu (University of Electronic Science and Technology of China, China), and Kun Yang (University of Electronic Science and Technology of China, China; University of Essex, U.K.)

#### Reconfigurable Blockchains for Dynamic Cluster-Based Applications .925.

Khalil Saadat (Institute for Communication Systems, Home of 5G Innovation Centre, University of Surrey, UK), Ning Wang (Institute for Communication Systems, Home of 5G Innovation Centre, University of Surrey, UK), Xinpeng Wei (Huawei Technologies, China), Bin Da (Huawei Technologies, China), and Rahim Tafazolli (Institute for Communication Systems, Home of 5G Innovation Centre, University of Surrey, UK)

An Effective Three-Channel Combination Configuration Method for ZigBee with WiFi Channel Interference 932  JianJun Tan (Hubei Minzu University, China), Xianbo Sun (Hubei Minzu University, China), Yong Huang (Hubei Minzu University, China), Jinqiao Yi (Hubei Minzu University, China), Tao Hu (Hubei Minzu University, China), and Li Zhu (Hubei Minzu University, China)
A New Controller Placement Technique using Colored Petri-Nets Modelling for SDNs .941
Topic Clustering Using Induced Squared Correlation Thresholding with Dimension Reduction .948  Ayodeji Ayorinde (University of Leicester, United Kingdom), John  Panneerselvam (University of Leicester, United Kingdom), Lu Liu  (University of Leicester, United Kingdom), and Dejun Miao (Yangzhou  Polytechnic College, China)
The 19th International Conference on Ubiquitous Computing and Communications (IUCC 2020)
Session IUCC 01: Ubiquitous Computing
Temporal Data Analytics on COVID-19 Data with Ubiquitous Computing .958
Evaluating Cloud Auto-Scaler Resource Allocation Planning under High-Performance Computing Workloads 966.  Kester Leochico (The University of Texas at San Antonio, United States) and Eugene John (The University of Texas at San Antonio, United States)
Container Scheduling in Blockchain-Based Cloud Service Platform .97.6
An Approach to Estimate Power Consumption of a CUDA Kernel 984
ECOMA:Edge-Cloud Collaborative Framework for Multi-Task Applications .992  Zhipeng Zhang (China Mobile Research Institute, China), Wenting Ma (China Mobile Research Institute, China), Qingqing Xu (China Mobile Research Institute, China), Renjie Tang (China Mobile Group Zhejiang Co., Ltd., China; Southeast University, China), Jinlang Wang (University of Pittsburgh, United States), and Wai Chen (China Mobile Research Institute, China)

Real-Time Detection of Cloud Tenant Malicious Behavior Based on CNN .998
Probabilistic Data Allocation in Pervasive Computing Applications 1006.  Kostas Kolomvatsos (University of Thessaly, Greece)
Porosity Prediction Based on GS+GA-XGBoost 1014.  Zechen Zheng (Xi'an Shiyou University, China), Shaowei Pan (Xi'an Shiyou University, China), Haining Luo (Research Institute of Exploration and Development, Tarim Oilfield Company, PetroChina, China), and Zhi Guo (Research Institute of Petroleum Exploration & Development, PetroChina, China)
Session IUCC 02: Ubiquitous System, Services and Applications I
Deep Learning Algorithms for Secure Robot Face Recognition in Cloud Environments 1021
The Underlying Causal Network from Global Dyadic Events: Allies and Rivals in International Relations .1029.  Lei Jiang (Microsoft, USA)
A Simulator for Reinforcement Learning Training in the Recommendation Field 1037
Twi Corpus: A Massively Twi-to-Handful Languages Parallel Bible Corpus 1043
SP-BTM: A Specific Part-of-Speech BTM for Service Clustering .1050
A Kernel Density Estimation-Based Variation Sampling for Class Imbalance in Defect Prediction .1058

Multi-Dimensional Analysis of Industrial Big Data Based JSON Document .1066
Commodity Search Algorithm Based on Ant Colony Algorithm 1074.  Zhishuo Liu (Beijing Jiaotong University, China) and Zhuonan Han (Beijing Jiaotong University, China)
Research on Relation Extraction Method Based on Multi-Channel Convolution and BiLSTM Model  1082  Tao Sun (Qilu University of Technology (Shandong Academy of Sciences), China) and Dong Wang (Qilu University of Technology (Shandong Academy of Sciences), China)
Session IUCC 03: Ubiquitous System, Services and Applications II
A Real-Time CSI-Based Passive Intrusion Detection Method .1091
Multi-Objective Particle Swarm Optimization Guided by Global Diversity and Cross-Generation Competition .1099.  Jing Zhao (Qilu University of Technology (Shandong Academy of Sciences), China) and Xiangyu Qu (Qilu University of Technology (Shandong Academy of Sciences), China)
Contributor Dilemma in Structured Tri-Game 1107.  Tongda Zhang (Southern University of Science and Technology, China), Futian Huang (Southern University of Science and Technology, China), Jun Qian (National Engineering Laboratory for E-Commerce Technologies, China), Xiao Sun (National Engineering Laboratory for E-Commerce Technologies, China), Yueting Chai (National Engineering Laboratory for E-Commerce Technologies, China), and Yi Liu (National Engineering Laboratory for E-Commerce Technologies, China)
Performance Analysis of Road Intersections Based on Game Theory and Dynamic Level-k Model  1112  Huisheng Wang (Tsinghua University, China), Yuejiang Li (Tsinghua University, China), and H. Vicky Zhao (Tsinghua University, China)
A Data-Driven Dynamic Stochastic Programming Framework for Ride-Sharing Rebalancing Problem under Demand Uncertainty .1120
A Heuristic Region-Based Concurrency Bug Testing Approach 1126

Predicting Sex and Age using Swipe-Gesture Data from a Mobile Device .1136
A Virtual Teaching Machine System Based on Oracle-Bone-Script Learning .1144
Distracted Driving Behavior Detection and Identification Based on Improved Cornernet-Saccade .1150
(Zhejiang Wanli University Ningbo, China), Zhen Hao Ni (Zhejiang CRRC Electric Vehicle Co. Ltd, wuxiang Town, Yinzhou District, Ningbo, Zhejiang Province, China), Zhan Guo Ye (Zhejiang CRRC Electric Vehicle Co. Ltd, wuxiang Town, Yinzhou District, Ningbo, Zhejiang Province,
China), Yuan Min Hu (Zhejiang CRRC Electric Vehicle Co. Ltd, wuxiang Town, Yinzhou District, Ningbo, Zhejiang Province, China), and Zhong Jie Zhu (Zhejiang Wanli University Ningbo, China)
Session IUCC 04: Ubiquitous Media and Signal Processing
The Influence of Emotion Expression on Ergonomics in Interface Design .1156
A Novel Hierarchical Threshold Secret Image Sharing Scheme .1163
S-IterE:Using Text Generation to Solve Entity Sparseness in Knowledge Reasoning .1168
AC + + A - M · C - 1 A + E - 1 M · 1 ( T · C - C - 117)
A Context-Aware Variational Auto-Encoder Model for Text Generation .1176

Customizing Super-Resolution Framework According to Image Features .1189	
Ninghui Yuan (National University of Defense Technology, China),	
Jingyu Liu (National University of Defense Technology, China), Qiong	
Wang (National University of Defense Technology, China), and Li Shen	
(National University of Defense Technology, China)	
A Film and TV News Digest Generation Method Based on HanLP .1197.	
Qing Wu (Communication University of Zhejiang, China), Qingsheng Li	
(Communication University of Zhejiang, China), JingJing Zhou	
(Communication University of Zhejiang, China), XiaoYa Long	
(Communication University of Zhejiang, China), Yunqing Guan	
(Communication University of Zhejiang, China), and HongPing Lin	
(Communication University of Zhejiang, China)	
Does Personality Evolve? A Ten-Years Longitudinal Study from Social Media Platforms .1205	
Raad Bin Tareaf (University of Potsdam - HPI, Germany), Seyed Ali	• • • •
Alhosseini (University of Potsdam - HPI, Germany), and Christoph	
Meinel (University of Potsdam - HPI, Germany)	
· · · · · · · · · · · · · · · · · · ·	
Session IUCC 05: Future Networks and Communications I	
A Multi-Threaded Accelerated Drug Combination Pathway Network Implementation .1214  Haolei Ye (The Australian National University, Australia), Shu Liu	• • • •
(The Australian National University, Australia), Wei Xiao (State Key	
Laboratory of New-tech for Chinese Medicine Pharmaceutical Process,	
China), Eric McCreath (The Australian National University, Australia),	
and Xinzhuang Zhang (State Key Laboratory of New-tech for Chinese Medicine Pharmaceutical Process, China)	
Dynamic Task Allocation for Robotic Network Cloud Systems .1221	
Saeid Alirezazadeh (C4 - Cloud Computing Competence Centre (C4-UBI),	
Universidade da Beira Interior, Covilha, Portugal) and Luís Alexandre	
(NOVA LINCS, Universidade da Beira Interior, Covilha, Portugal)	
RSFP: Reliable Service Function Placement with Optimized Resource Consumption in Data	
Center Networks 1229	
Hong Tang (Sun Yat-sen University, China; Guangzhou Institute of China	
Telecom, China), Ao Ku (Huazhong University of Science and Technology,	
China), Wei Liu (Huazhong University of Science and Technology,	
China), and Haojun Huang (Huazhong University of Science and	
Technology, China)	
Network Evaluation and Planning for Large-Scale Low Earth Orbit Satellite Constallation	
Networks .1235.	•••
Li Shen (Space Engineering University, China), Huanren Zhou (Institute	
of Software Chinese Academy of Sciences, China), Xiaoting Wang	
(Beijing Institute of Tracking and Telecommunications Technology,	
China), Wenping Li (Beijing Institute of Tracking and	
Telecommunications Technology, China), Yuanyuan Fan (Institute of	
Software Chinese Academy of Sciences, China), Shan Wu (Institute of	
Software Chinese Academy of Sciences, China), and Shuaijun Liu	
(Institute of Software Chinese Academy of Sciences, China)	

A Novel Strong Cache Consistency Mechanism in ICN Based on Role Division and Lease Model .1241 Shuokang Huang (ICNLAB, Peking University, P.R. China), Shuai Zhu (ICNLAB, Peking University, P.R. China), Kai Lei (ICNLAB, Peking University, P.R. China; PCL Research Center of Networks and Communications, Peng Cheng Laboratory, P.R. China), Haiyi Lian (China Resources - Smart and Information Technology Department, P.R. China), and Shouyang Wei (China Resources - Smart and Information Technology Department, P.R. China)

An Aggregate Authentication Framework for Unmanned Aerial Vehicle Cluster Network .1249...

Jingyi Li (Guilin University of Electronic Technology, China), Meng Zhao (Guilin University of Electronic Technology, China), Yong Ding (Guilin University of Electronic Technology, China; Cyberspace Security Research Center, Pengcheng Laboratory, China), Dennis Y. W. (The Hong Kong Polytechnic University, China), Yujue Wang (Guilin University of Electronic Technology, China), and Hai Liang (Guilin University of Electronic Technology, China)

#### Session IUCC 06: Future Networks and Communications II

A Spatio-Temporal Event Model for Unmanned System Swarm .127.1....

Yukun Yang (Northwestern Polytechnical University, China), Yuan Yao (Northwestern Polytechnical University, China), Gang Yang (Northwestern Polytechnical University, China), and Xingshe Zhou (Northwestern Polytechnical University, China)

User Identity Linkage across Location-Based Social Networks with Spatio-Temporal Check-in Patterns 1278.

Fengxiang Ding (Huazhong University of Science and Technology, Wuhan China), Xiaoqiang Ma (Huazhong University of Science and Technology, Wuhan China), Yang Yang (Hubei University, Wuhan China; The Hong Kong Polytechnic University, Hong Kong), and Chen Wang (Huazhong University of Science and Technology, Wuhan China)

Maritime Broadband Communications: Applications, Challenges and an Offshore 5G-Virtual MIMO Paradigm .1286.

Cunqian Yu (Dalian Maritime University, China), Jingyu Li (Dalian Maritime University, China), Chunfang Zhang (Dalian Maritime University, China), Hang Li (Dalian Maritime University, China), Rongxi He (Dalian Maritime University, China), and Bin Lin (Dalian Maritime University, China)

An Intelligent Evaluation Method of Application Scenario Complexity Level of Unmanned Swarms 1292.

Wenliang Wu (Northwestern Polytechnical University, China) and Xingshe
Zhou (Northwestern Ploytechnical University, China)

## The 3rd International Workshop on Next Generation Data-Driven Networks (NGDN 2020)

#### Session NGDN: Next Generation Data-Driven Networks

China)
A Practical Workflow in Cleaning Master Data .1311......

PORA: Piggybacking-Based Opportunistic Routing for Asynchronous Duty-Cycled WSNs .1315... Weiqi Wu (University of Science and Technology of China, China), Xingfu Wang (University of Science and Technology of China, China), Ammar Hawbani (University of Science and Technology of China, China), and Taiyaba Qureshi (University of Science and Technology of China,

Shuang Yi (inossem.inc, China) and Hailiang Ye (inossem.inc, China)

China)

# The 4th Internet of Things of Big Data for Healthcare (IoTBDH 2020)

### Session IoTBDH: Internet of Things of Big Data for Healthcare

Interoperable Multi-Modal Data Analysis Platform for Alzheimer's Disease Management .1321....

Zhen Pang (Yunnan University, China), Shuhao Zhang (Yunnan University,
China), Yun Yang (Yunnan University, China), Jun Qi (Xi'an
JiaoTong-Liverpool University, China), and Po Yang (University of
Sheffield, UK)

Visual Analysis of Biomarkers Selected via Multi-Task Learning for Modeling Alzheimer's Disease Progression .1328.

Xulong Wang (Yunnan University, China), Gaoshan Bi (Yunnan University, China), Yu Zhang (University of Sheffield, China), Jun Qi (Xi'an JiaoTong-Liverpool University, China), Yun Yang (Yunnan University, China), and Po Yang (University of Sheffield, China)

Investigation of Side-Polished Panda Fibers for Strain Measurement and Surface Plasmon Resonance-Based Biochemical Sensing .1334
A Hybrid Hierarchical Model for Accessing Physical Activity Recognition Towards Free-Living Environments .1342
Experimental Analysis of Artificial Neural Networks Performance for Accessing Physical Activity Recognition in Daily Life 1348
Tang (amocrony of onegyteta, china)
The 2020 International Workshop on Machine Learning Empowered Future Network (MLFuNet 2020)
The 2020 International Workshop on Machine Learning Empowered
The 2020 International Workshop on Machine Learning Empowered Future Network (MLFuNet 2020)
The 2020 International Workshop on Machine Learning Empowered Future Network (MLFuNet 2020)  Session MLFuNet: Machine Learning Empowered Future Network  Price Learning in Joint Resource Allocation and Power Control Game in Heterogeneous Cellular Networks 1354

#### An Improved Energy Saving Strategy for SDN-Based Data Center .1371.....

Peng Hong Yu (Tang Shan University, China), Xiao HanLiang (Southwest Jiaotong University, China), Hao TianLu (Computation Center. Tang Shan University, China), Wang Kan (National Energy Conservation Center, China), Chen ZhenKai (Liaoning Market Supervision Service Center, China), and Xu LeXi (China United Network Communications Corporation, China)

#### An Energy Efficiency Strategy Based on Bayesian Classification in SDN DataCenter .1377......

HanLiang Xiao (Southwest Jiaotong University, China), HongYu Peng (TangShan University, China), and Sha Gong (Southwest Jiaotong University, China)

#### An Improved Firework Algorithm Based on Local Search Optimization 1383.....

Sha Gong (Southwest Jiaotong University, China), Hong Yu Peng (Tang Shan University, China), Qi Dai (Southwest Jiaotong University, China), and Han Liang Xiao (Southwest Jiaotong University, China)

## Recognition and Optimization of Atmospheric Duct in TD-LTE System Based on Convolutional Neural Network 1389.

Jin-Hu Shen (Network Planning and Design Optimization R&D Center, China Mobile Group Design Institute Co., Ltd, China), Ji-Xiang Liu (China Mobile Group Liaoning, Co., Ltd, China), Jing-Lei Zuo (Network Planning and Design Optimization R&D Center, China Mobile Group Design Institute Co., Ltd, China), Wen-Bo Ding (China Mobile Group Liaoning, Co., Ltd, China), Ao Shen (Network Planning and Design Optimization R&D Center, China Mobile Group Design Institute Co., Ltd, China), Yuan Fang (Network Planning and Design Optimization R&D Center, China Mobile Group Design Institute Co., Ltd, China), Yang Zhang (China Mobile Group Co., Ltd, China), Xi-Dian Wang (Network Planning and Design Optimization R&D Center, China Mobile Group Design Institute Co., Ltd, China), and Feng Luo (Network Planning and Design Optimization R&D Center, China Mobile Group Design Institute Co., Ltd, China)

#### Design of Performance Benchmark for Time Series Databases .1394.

Miaoqiong Wang (China Academy of Information and Communications Technology, Cloud Computing and Big Data Research Institute, China), Siyuan Liu (China Academy of Information and Communications Technology, Cloud Computing and Big Data Research Institute, China), Kai Wei (China Academy of Information and Communications Technology, Cloud Computing and Big Data Research Institute, China), Han Liu (China Academy of Information and Communications Technology, Cloud Computing and Big Data Research Institute, China), Chunyu Jiang (China Academy of Information and Communications Technology, Cloud Computing and Big Data Research Institute, China), Shu Yan (China Academy of Information and Communications Technology, Cloud Computing and Big Data Research Institute, China), and Pengwei Ma (China Academy of Information and Communications Technology, Cloud Computing and Big Data Research Institute, China)

# The 2020 International Workshop on AI-Driven Smart System (AISys 2020)

## Session AISys 01: AI-Driven Smart System I

Challenges and Opportunities for Terrestrial Network Operators in the Air-Space-Ground Integrated Network 1400.
Yushan Pei (China United Telecommunications Co. Research Institute, China), Shouye Miao (China United Telecommunications Co. Ltd, China), and Fuchang Li (China United Telecommunications Co. Research Institute, China)
Exemplar Loss for Siamese Network in Visual Tracking .1405  Shuo Chang (Beijing University of Posts and Telecommunications, China), Hua Lu (GuangDong Communication & Networks Institute, China), Sai Huang (Beijing University of Posts and Telecommunications, China), and Yifan Zhang (Beijing University of Posts and Telecommunications, China)
An Improved Small-World Topology for Optimizing the Performance of Echo State Network .141 Sha Gong (Southwest Jiaotong University, China), HongYu Peng (TangShanUniversity, China), Qi Dai (Southwest Jiaotong University, China), HanLiang Xiao (Southwest Jiaotong University, China), ZhenKai Chen (Liaoning Market Supervision Service Center, China), and TianLu Hao (Computation Center, TangShan University, China)
Research and Application of AI in 5G Network Operation and Maintenance .1420
Research on Infrastructure Project Financial System Based on Power Grid Big Data .1426
An Improved Data Discretization Algorithm Based on Rough Sets Theory .1432
State of Charge Estimation of Low-Speed Electric Vehicle Battery using Back Propagation Neural Network .1438

## Session AISys 02: AI-Driven Smart System II

Research on Energy Dispatching Strategy Based on Energy Forecast Algorithm for Data Center 1444  HanLiang Xiao (Southwest Jiaotong University, China), Hong Yu Peng (Tang Shan University, China), Sha Gong (Southwest Jiaotong University, China), and LeXi Xu (China United Network Communications Corporation, China)
A Novel 5G Core Network Capability Exposure Method for Telecom Operator .145.0
Research on Intelligent Optimization of Massive MIMO Coverage Based on 5G MR .1455
5G Core Network Framework Based on Artificial Intelligence .1460
Research on Photoelectric Effect for Artificial Satellite Communication .1465
Green Light Optimal Speed Advisory Systems under Multi-Modal Traffic Environments for Reducing Fuel Consumption .1470
The 6th International Symposium on Social Media Mining and Analysis (SMMA 2020)
Session SMMA: Social Media Mining and Analysis
Application of Iteration Function System for Ceramic Tile Design .1475

**Author Index**