

**2018 IEEE International Conference on
Parallel & Distributed Processing with
Applications, Ubiquitous Computing
& Communications, Big Data & Cloud
Computing, Social Computing &
Networking, Sustainable Computing &
Communications
(ISPA/IUCC/BDCloud/SocialCom/SustainCom 2018)**

**Melbourne, Australia
11-13 December 2018**

Pages 1-596



IEEE Catalog Number: CFP1852Z-POD
ISBN: 978-1-7281-1142-1

**Copyright © 2018 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:	CFP1852Z-POD
ISBN (Print-On-Demand):	978-1-7281-1142-1
ISBN (Online):	978-1-7281-1141-4

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

2018 IEEE Intl Conf on Parallel & Distributed Processing with Applications, Ubiquitous Computing & Communications, Big Data & Cloud Computing, Social Computing & Networking, Sustainable Computing & Communications

Table of Contents

Message from the ISPA 2018 Chairs	xxiii
ISPA 2018 Program Committee	xxv
Message from the IUCC 2018 Chairs	xxviii
IUCC 2018 Program Committee	xxix
Message from the BDCloud 2018 Chairs	xxx
BDCloud 2018 Program Committee	xxxii
Message from SocialCom 2018 Chairs	xxxiv
SocialCom 2018 Program Committee	xxxv
Message from the SustainCom 2018 Chairs	xxxvii
SustainCom 2018 Program Committee	xxxviii

16th IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA 2018)

Solution Space Adjustable CNF Obfuscation for Privacy-Preserving SAT Solving	1
<i>Ying Qin (National University of Defense Technology), Yan Ding (National University of Defense Technology), Yusong Tan (National University of Defense Technology), and Qingbo Wu (National University of Defense Technology)</i>	
Joint Optimization of Stateful VNF Placement and Routing Scheduling in Software-Defined Networks	9
<i>Jiugen Shi (Hefei University of Technology), Ji Wang (Hefei University of Technology), Huawei Huang (Kyoto University), Lulu Shen (Hefei University of Technology), Jin Zhang (Hefei University of Technology), and Hao Xu (Hefei University of Technology)</i>	

A Low Cost Method for Determining the Entire Network Path Bandwidths of Indirect High-Performance Computer Networks 15

Baicheng Yan (Beihang University), Yi Zhou (Beihang University), Limin Xiao (Beihang University), Zhang Yang (Institute of Applied Physics and Computational Mathematics), Hongyu Wu (Beihang University), and Bing Wei (Beihang University)

Efficient Parallel CTL Model-Checking for Pushdown Systems 23

Xinyu Chen (East China Normal University), Hansheng Wei (East China Normal University), Xin Ye (East China Normal University), Li Hao (East China Normal University), Yanhong Huang (East China Normal University), and Jianqi Shi (East China Normal University)

Acoustics Simulation on Sunway TaihuLight Based on Solving the Integral of Ffowcs Williams-Hawkings Equation 31

Wenhao Zhu (Shanghai University), Wu Zhang (Shanghai University), Bohan Ding (Shanghai University), and Kangle Xu (Shanghai Aircraft Design and Research Institute)

An Effective Clustering Method for Finding Density Peaks 39

Rui-dong Qi (Inner Mongolia University), Jian-tao Zhou (Inner Mongolia University), and Xiaoyu Song (Portland State University)

WEAVER: An Energy Efficient, General-Purpose Acceleration Architecture for String Operations in Big Data Applications 47

Wenming Li (Institute of Computing Technology), Xiaochun Ye (Institute of Computing Technology), Da Wang (Institute of Computing Technology), Hao Zhang (Institute of Computing Technology), Dongdong Wu (Institute of Computing Technology), Zhimin Zhang (Institute of Computing Technology), and Dongrui Fan (Institute of Computing Technology)

Tail-PASS: Resource-Based Cache Management for Tiled Graphics Rendering Hardware 55

Germán Ceballos (Uppsala University), Erik Hagersten (Uppsala University), and David Black-Schaffer (Uppsala University)

A Truthful Profit-Oriented Mechanism for Mobile Crowdsensing 64

Yu Qiao (Nanjing University), Yi Gu (Nanjing University), Jun Wu (Nanjing University), Lei Zhang (Nanjing University), and Chongjun Wang (Nanjing University)

A False-Name-Proof Protocol for Multicast Routing Auctions 72

Yu Qiao (Nanjing University), Yue Song (Nanjing University), Nan Wang (Megvii Inc.), Jun Wu (Nanjing University), Lei Zhang (Nanjing University), and Chongjun Wang (Nanjing University)

SLA-Aware and Energy-Efficient VM Consolidation in Cloud Data Centers Using Host States Naive Bayesian Prediction Model 80

Lianpeng Li (Harbin Institute of Technology), Jian Dong (Harbin Institute of Technology), Decheng Zuo (Harbin Institute of Technology), and Jiayi Liu (Harbin Institute of Technology)

Parallel Model Checking on Pushdown Systems 88

Hansheng Wei (East China Normal University), Xinyu Chen (East China Normal University), Xin Ye (Laboratoire d'Informatique de Paris-Nord & Paris University 7), Neng Fu (East China Normal University), Yanhong Huang (East China Normal University), and Jianqi Shi (East China Normal University)

Effective Clustering Analysis Based on New Designed Clustering Validity Index and Revised K-Means Algorithm for Big Data 96

Erzhou Zhu (Anhui University), Peng Wen (Anhui University), Binbin Zhu (Anhui University), Feng Liu (Anhui University), Futian Wang (Anhui University), and Xuejun Li (Anhui University)

Distributed Parallelizability Analysis of Legacy Code 103

Junfeng Zhao (Inner Mongolia University), Zhimei Zhao (Inner Mongolia University), and Hongji Yang (University of Leicester)

Efficient Online Stream Deduplication for Network Block Storage 111

Hongli Lu (Tianjin University of Technology), Guangping Xu (Tianjin University of Technology), Bo Tang (Tianjin University of Technology), Shengli Li (Tianjin IC Card Public Network System Co. Ltd.), and Mian Zhou (Tianjin University of Technology)

A Partition Matching Method for Optimal Attack Path Analysis 120

Hui Xie (Beijing Institute of Technology), Kun Lv (Beijing Institute of Technology), and Changzhen Hu (Beijing Institute of Technology)

Big Data Processing in Fog - Smart Parking Case Study 127

Sang Nguyen (University of Auckland), Zoran Salcic (University of Auckland), and Xuyun Zhang (University of Auckland)

Asynchronous Group-Based ADMM Algorithm under Efficient Communication Structure 135

Jianhui Zhou (Shanghai University) and Yongmei Lei (Shanghai University)

Exploring Parallelism in MiBench with Loop and Procedure Level Speculation 141

Deqing Bu (Southwest University of Science and Technology), Yaobin Wang (Southwest University of Science and Technology), Ling Li (Southwest University of Science and Technology), Zhiqin Liu (Southwest University of Science and Technology), Wenxin Yu (Southwest University of Science and Technology), and Manasah Musariri (Southwest University of Science and Technology)

Reducing Time and/or Memory Consumption of the SOG Construction in a Parallel Context 147

Hiba Ouni (University of Paris 13), Kais Klai (University of Paris 13), Chiheb Ameer Abid (University of Tunis el Manar), and Belhassen Zouari (University of Tunis Carthage)

FLAC Decoding Using GPU Acceleration 155

Haolei Ye (Australian National University) and Eric McCreath (Australian National University)

Loop Perforation in OpenACC 163

Ahmad Lashgar (University of Victoria), Ehsan Atoofian (Lakehead University), and Amirali Baniyadi (University of Victoria)

Accelerating Blockchain Transfer System Using FPGA-Based NIC 171

Yuma Sakakibara (Keio University), Yuta Tokusashi (Keio University), Shin Morishima (Keio University), and Hiroki Matsutani (Keio University)

An Energy and Robustness Adjustable Optimization Method of File Distribution Services 179

Dongchao Ma (North China University of Technology), Hongchao Li (North China University of Technology), Xingguo Sun (North China University of Technology), Li Ma (North China University of Technology), and Chengan Zhao (Capital Normal University)

- Subgroup Discovery Method Based on User Behavior Analysis 187
Yue Yang Yang (Harbin Engineering University), Wangqiaohong Wang (Harbin Engineering University), Yangjing Yang (Harbin Engineering University), zhangjianpei zhang (Harbin Engineering University), and Maxiaoyang Ma (Harbin Engineering University)
- Neighboring and Non-Neighboring Features for Pedestrian Detection 193
Youze Zhu (East China Normal University), Yanqin Yang (East China Normal University), and Wenchao Xu (East China Normal University)
- Fisher: An Efficient Container Load Prediction Model with Deep Neural Network in Clouds 199
Xuehai Tang (Institute of Information Engineering), Qiuyang Liu (Institute of Information Engineering), Yangchen Dong (Institute of Information Engineering), Jizhong Han (Institute of Information Engineering), and Zhiyuan Zhang (Institute of Information Engineering)
- High-Performance and Energy-Efficient Fault Tolerance Scheduling Algorithm Based on Improved TMR for Heterogeneous System 207
Shigan Yu (SKL Computer Architecture, ICT, CAS & University of Chinese Academy of Sciences & State Engineering Laboratory of Advanced Microprocessor Technology & Fuyang Normal University), Zhimin Tang (SKL Computer Architecture, ICT, CAS & State Engineering Laboratory of Advanced Microprocessor Technology), Xiaochun Ye (SKL Computer Architecture, ICT, CAS), Zhimin Zhang (SKL Computer Architecture, ICT, CAS), Dongrui Fan (SKL Computer Architecture, ICT, CAS), and Zhiying Jiang (SKL Computer Architecture, ICT, CAS)
- Site-Effect-Based Semi-Synchronous Label Propagation Algorithm for Community Detection 215
Tianqi Liu (Nanjing University of Aeronautics and Astronautics & Collaborative Innovation Center of Novel Software Technology and Industrialization), Xuefeng Yan (Nanjing University of Aeronautics and Astronautics & Collaborative Innovation Center of Novel Software Technology and Industrialization), and Cen Shenzhi (Nanjing University of Aeronautics and Astronautics)
- Adaptive Centre-Weighted Oversampling for Class Imbalance in Software Defect Prediction 223
Qi Zha (Nanjing University of Aeronautics and Astronautics), Xuefeng Yan (Nanjing University of Aeronautics and Astronautics & Collaborative Innovation Center of Novel Software Technology and Industrialization), and Yong Zhou (Nanjing University of Aeronautics and Astronautics)
- LogoPhish: A New Two-Dimensional Code Phishing Attack Detection Method 231
Wenbin Yao (Beijing University of Posts and Telecommunications), Yuanhao Ding (Beijing University of Posts and Telecommunications), and Xiaoyong Li (Beijing University of Posts and Telecommunications)
- Fault-Tolerant Edge-Pancyclicity of Möbius Cube MQ_n 237
Xirong Xu (Dalian University of Technology), Huifeng Zhang (Dalian University of Technology), and Pir Soomro (Dalian University of Technology)
- Acceleration of Anomaly Detection in Blockchain Using In-GPU Cache 244
Shin Morishima (Keio University) and Hiroki Matsutani (Keio University)

- Gaia Scheduler: A Kubernetes-Based Scheduler Framework 252
Shengbo Song (Tencent Inc.), Lelai Deng (Tencent Inc.), Jun Gong (Tencent Inc.), and Hanmei Luo (Tencent Inc.)
- Design of a Compact and Reconfigurable Onboard Data Handling System 260
Qing Zhou (Beijing Institute of Technology), Qingjie Zhao (Beijing Institute of Technology), Li Zhou (National Space Science Center, CAS), Junshe An (National Space Science Center, CAS), Changbin Xue (National Space Science Center, CAS), Yuyin Tan (National Space Science Center, CAS), and Jianing Rao (National Space Science Center, CAS)
- URL2Vec: URL Modeling with Character Embeddings for Fast and Accurate Phishing Website Detection 265
Huaping Yuan (Guangdong University of Technology), Zhenguo Yang (Guangdong University of Technology), Xu Chen (Guangdong University of Technology), Yukun Li (Guangdong University of Technology), and Wenyin Liu (Guangdong University of Technology)
- Personalized Commodity Recommendations of Retail Business Using User Feature Based Collaborative Filtering 273
Feiran Wang (Hunan University of Science and Technology & Swinburne University of Technology), Yiping Wen (Hunan University of Science and Technology), Tianhang Guo (Hunan University of Science and Technology), Jinjun Chen (Hunan University of Science and Technology & Swinburne University of Technology), and Buqing Cao (Hunan University of Science and Technology)
- A Transition State Cost Sensitive Virtual Machines Consolidation 279
Najet Hamdi (Sfax National School of Engineers), Walid Chainbi (University of Sousse), and Mohamed Ali Mahjoub (University of Sousse)
- Efficient Coflow Scheduling of Multi-Stage Jobs with Isolation Guarantee 287
Zifan Liu (Nanjing University), Haipeng Dai (Nanjing University), Bingchuan Tian (Nanjing University), Wajid Rafique (Nanjing University), and Wanchun Dou (Nanjing University)
- Effective Cooperative UAV Searching Using Adaptive STGM Mobility Model in a FANET 295
Xianfeng Li (Peking University), Jianfeng Li (Peking University), and Jie Chen (Peking University)
- A Data Related Behaviors Automatic Detection Method for Parallel Software Testing 302
Tao Sun (Inner Mongolia University) and Wenjie Zhong (Inner Mongolia University)
- A Blockchain-Based Offloading Approach in Fog Computing Environment 308
Wenda Tang (Nanjing University), Xuan Zhao (Nanjing University), Wajid Rafique (Nanjing University), and Wanchun Dou (Nanjing University)
- Managing Heterogeneous Substrate Resources by Mapping and Visualization Based on Software-Defined Network 316
Amir Javadpour (Guangzhou University), Guojun Wang (Guangzhou University), and Xiaofei Xing (Guangzhou University)
- On Real-Time Monitoring on Data Stream for Traffic Flow Anomalies 322
Xinzhou Dong (Institute of Software), Beihong Jin (Institute of Software), Bo Tang (Institute of Software), and Hongyin Tang (Institute of Software)

- Asymmetric-ReRAM: A Low Latency and High Reliability Crossbar Resistive Memory Architecture 330
Yang Zhang (Huazhong University of Science and Technology), Dan Feng (Huazhong University of Science and Technology), Zhipeng Tan (Huazhong University of Science and Technology), Jingning Liu (Huazhong University of Science and Technology), Wei Tong (Huazhong University of Science and Technology), and Chengning Wang (Huazhong University of Science and Technology)
- Hierarchical Attention Based Recurrent Neural Network Framework for Mobile MOBA Game Recommender Systems 338
Qiongjie Yao (Huazhong University of Science and Technology), Xiaofei Liao (Huazhong University of Science and Technology), and Hai Jin (Huazhong University of Science and Technology)
- Delay-Aware Secure Computation Offloading Mechanism in a Fog-Cloud Framework 346
Yang Yang (Beijing Jiaotong University), Xiaolin Chang (Beijing Jiaotong University), Zhen Han (Beijing Jiaotong University), and Lin Li (Beijing Jiaotong University)
- A Comprehensive Detection of Memory Corruption Vulnerabilities for C/C++ Programs 354
Yuhan Gao (Institute of Information Engineering & University of Chinese Academy of Science), Liwei Chen (Institute of Information Engineering), Gang Shi (Institute of Information Engineering), and Fei Zhang (Institute of Information Engineering & University of Chinese Academy of Science)
- Using Centralized I/O Scheduling Service (CISS) to Improve Cloud Object Storage Performance 361
Xiao Shi (Institute of Computing Technology & University of Chinese Academy of Sciences), Detian Hu (Institute of Computing Technology & University of Chinese Academy of Sciences), Hongwei Tang (Institute of Computing Technology & University of Chinese Academy of Sciences), Xiaohui Zheng (Institute of Computing Technology & University of Chinese Academy of Sciences), and Xiaofang Zhao (Institute of Computing Technology & University of Chinese Academy of Sciences)
- Adjusting Matching Algorithm to Adapt to Dynamic Subscriptions in Content-Based Publish/Subscribe Systems 369
Weichao Mao (Shanghai Jiao Tong University), Jian Cao (Shanghai Jiao Tong University), Guangtao Xue (Shanghai Jiao Tong University), Jiadi Yu (Shanghai Jiao Tong University), Yanmin Zhu (Shanghai Jiao Tong University), Minglu Li (Shanghai Jiao Tong University), Wenjuan Li (Hangzhou Normal University), and Shiyong Qian (Shanghai Jiao Tong University)
- Improving Branch Prediction Accuracy on Multi-Core Architectures for Big Data 377
Qi Yu (National University of Defense Technology), Libo Huang (National University of Defense Technology), Hui Guo (National University of Defense Technology), Cheng Qian (National University of Defense Technology), Sheng Ma (National University of Defense Technology), and Zhiying Wang (National University of Defense Technology)
- AALB: Adaptive Algorithm of Load Balance for CAM Physics on Sunway TaihuLight Supercomputer 383
Heng Guo (No.88, Shanshui East Road), Zuoning Chen (No. 88, Shanshui East Road), and Xin Liu (No. 88, Shanshui East Road)

- An Online Sockpuppet Detection Method Based on Subgraph Similarity Matching 391
Jingli Wang (Institute of Information Engineering, CAS & University of Chinese Academy of Sciences), Wei Zhou (Institute of Information Engineering, CAS & University of Chinese Academy of Sciences), Jiacheng Li (Institute of Information Engineering, CAS & University of Chinese Academy of Sciences), Zhou Yan (Institute of Information Engineering, CAS & University of Chinese Academy of Sciences), Jizhong Han (Institute of Information Engineering, CAS & University of Chinese Academy of Sciences), and Songlin Hu (Institute of Information Engineering, CAS & University of Chinese Academy of Sciences)
- Proportion Scheduler to Improve the Mismatched Locality in YARN 399
Jie Xu (Beijing University of Posts and Telecommunications), Jingyu Wang (Beijing University of Posts and Telecommunications), Qi Qi (Beijing University of Posts and Telecommunications), and Jianxin Liao (Beijing University of Posts and Telecommunications)
- Memory Cache Attacks on Alluxio Impede High Performance Computing 407
Yizhe Yang (Peking University), Qingni Shen (Peking University), Wu Xin (Peking University), Wenjun Qian (Peking University), Yahui Yang (Peking University), and Zhonghai Wu (Peking University)
- On Extending a Fixed Size, Persistent and Lock-Free Hash Map Design to Store Sorted Keys 415
Miguel Areias (University of Porto) and Ricardo Rocha (University of Porto)
- Wi-Fi Radar Placement for Coverage in Collapsed Structures 423
Muhammad Faizan Khan (Guangzhou University), Guojun Wang (Guangzhou University), Md Zakirul Alam Bhuiyan (Fordham University), and Shuhong Chen (Guangzhou University)
- A Hierarchical CPN Model Automatically Generating Method Aiming at Multithreading Program Algorithm Error Detection 431
Tao Sun (Inner Mongolia University) and Yangyang Liu (Inner Mongolia University)
- Heuristic Prefetching Caching Strategy to Enhance QoE in Edge Computing 438
Meng Sun (Shanghai Jiao Tong University) and Haopeng Chen (Shanghai Jiao Tong University)
- Parallel Software Testing Sequence Generation Method Based on State Pruning 446
Tao Sun (Inner Mongolia University), Ting Zhang (Inner Mongolia University), and Xin Guo (Inner Mongolia University)
- A Topology-Based Approach to Pattern Recognition on Graph-Structured Data 454
Jun Chen (Shanghai Jiao Tong University) and Haopeng Chen (Shanghai Jiao Tong University)
- Pricing Cloud Resource Based on Multi-Agent Reinforcement Learning in the Competing Environment 462
Bing Shi (Wuhan University of Technology & Nanjing University), Han Yuan (Wuhan University of Technology), and Rongjian Shi (Wuhan University of Technology)
- GaiaGPU: Sharing GPUs in Container Clouds 469
Jing Gu (Peking University), Shengbo Song (Tencent), Ying Li (Peking University), and Hanmei Luo (Tencent)
- A Revised DNA Computing Model of Inversion and Division over Finite Field $GF(2^n)$ 477
Yongnan Li (People's Public Security University of China)

- Re-Running Large-Scale Parallel Programs Using Two Nodes 485
Yayu Guo (Beihang University), Fang Lin (Beihang University), Yi Liu (Beihang University), and Depei Qian (Beihang University)
- A Co-Location-Based Approach for Business Site Selection Using Ontologies 493
Xuguang Bao (Yunnan University) and Lizhen Wang (Yunnan University)
- Working Set Size Estimation with Hugepages in Virtualization 501
Jingyuan HU (Peking University), Xiaokuang Bai (Peking University), Sai Sha (Peking University), Yingwei Luo (Peking University), Xiaolin Wang (Peking University), and Zhenlin Wang (Michigan Technological University)
- Web Service Recommendation via Combining Doc2Vec-Based Functionality Clustering and DeepFM-Based Score Prediction 509
Xiangping Zhang (Hunan University of Science and Technology), Jianxun Liu (Hunan University of Science and Technology), Buqing Cao (Hunan University of Science and Technology), Qiaoxiang Xiao (Hunan University of Science and Technology), and Yiping Wen (Hunan University of Science and Technology)
- Maximizing Influence Propagation in Networks by User-Relational Iterative Ranking Algorithm 517
Wenbin Yao (Beijing University of Posts and Telecommunications), Lijuan Zhang (Beijing University of Posts and Telecommunications), and Xiaoyong Li (Beijing University of Posts and Telecommunications)
- Performance Optimization of Large Files Writes to Ceph Based on Multiple Pipelines Algorithm 525
Ke Zhan (Institute of Information Engineering), Lili Xu (Institute of Information Engineering), Zimu Yuan (Institute of Information Engineering), and Weijuan Zhang (Institute of Information Engineering)
- Fast Real-Time Scheduling for Ethernet-Based Train Control Networks 533
Qinghan Yu (Tsinghua University), Tian Wang (Tsinghua University), Xibin Zhao (Tsinghua University), Hai Wang (Tsinghua University), Yue Gao (Tsinghua University), Chenyang Lu (Washington University in St. Louis), and Ming Gu (Tsinghua University)
- DEARS: A Deep Learning Based Elastic and Automatic Resource Scheduling Framework for Cloud Applications 541
Muhammad Hassan (Shanghai Jiao Tong University), Haopeng Chen (Shanghai Jiao Tong University), and Yutong Liu (Shanghai Jiao Tong University)
- Secure Spatial Network Queries on Cloud Platform 549
Yiping Teng (Shenyang Aerospace University), Jinyan Liu (Shenyang Aerospace University), Xiaoting Liu (Shenyang Aerospace University), Guohui Ding (Shenyang Aerospace University), and Chunlong Fan (Shenyang Aerospace University)

- A Demand-Driven Pointer-Range Analysis Technique for Data Transmission Optimization 557
Bo Zhao (Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen), Xiaoyan Xu (State Key Laboratory of Mathematical Engineering and Advanced Computing), Peng Liu (State Key Laboratory of Mathematical Engineering and Advanced Computing), Yingying Li (State Key Laboratory of Mathematical Engineering and Advanced Computing), Rongcai Zhao (State Key Laboratory of Mathematical Engineering and Advanced Computing), and Ramin Yahyapour (Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen)
- MalFilter: A Lightweight Real-Time Malicious URL Filtering System in Large-Scale Networks 565
Guolin Tan (Institute of Information Engineering), Peng Zhang (Institute of Information Engineering), Qingyun Liu (Institute of Information Engineering), Xinran Liu (National Computer Network Emergency Response and Coordination Center), Chungu Zhu (National Computer Network Emergency Response and Coordination Center), and Li Guo (Institute of Information Engineering)
- Cymbalo: An Efficient Graph Processing Framework for Machine Learning 572
Xinhui Tian (Institute of Computing Technology, CAS & University of Chinese Academy of Sciences), Biwei Xie (Institute of Computing Technology, CAS & University of Chinese Academy of Sciences), and Jianfeng Zhan (Institute of Computing Technology, CAS & University of Chinese Academy of Sciences)
- Contract-Based Demand Response Model for High Performance Computing Systems 580
Kishwar Ahmed (Florida International University), Jesse Bull (Florida International University), and Jason Liu (Florida International University)
- Towards Energy-Efficient Scheduling with Batch Processing for Instance-Intensive Cloud Workflows 590
Zhibin Wang (Hunan University of Science and Technology), Yiping Wen (Hunan University of Science and Technology), Jinjun Chen (Swinburne University of Technology), Buqing Cao (Hunan University of Science and Technology), and Feiran Wang (Hunan University of Science and Technology)
- Fisher Discriminant Analysis Random Forest for Online Class Incremental Learning 597
Wang Xiong (National University of Defense Technology), Yijie Wang (National University of Defense Technology), and Li Cheng (National University of Defense Technology)
- Accelerating Lattice QCD on Sunway Many-Core Processor 605
Zengxiao Zhang (BeiHang University), Zhongzhi Luan (BeiHang University), Chongyang Xu (BeiHang University), Ming Gong (Institute of High Energy Physics), and Shun Xu (Computer Network Information Center)
- Secure Virtual Machine Placement and Load Balancing Algorithms with High Efficiency 613
Yuchen Wong (Peking University) and Qingni Shen (Peking University)
- PacketCache: Improving OS Stacks for Streaming with Identical Contents 621
Xiaohui Luo (Tsinghua University), Danfeng Shan (Tsinghua University), Tong Zhang (Tsinghua University), Hao Zhang (Northwest University), Xunli Fan (Northwest University), and Fengyuan Ren (Tsinghua University)

- Energy-Efficient Strategy for Placement of Online Services on Dynamic Availability Resources in Volunteer Cloud 629
Omar Ben Maaouia (University of Tunis El Manar), Hazem Fkaier (University of Tunis), Christophe Cerin (Université Paris 13 Villetaneuse), and Mohamed Jemni (University of Tunis)
- Optimizing Tiled Matrix-Matrix Product According to Cache Performance Enhancement 637
Emna Hammami (University of Tunis El Manar) and Yosr Slama (University of Tunis El Manar)
- Deep Learning for Phishing Detection 645
Wenbin Yao (Beijing University of Posts and Telecommunications), Yuanhao Ding (Beijing University of Posts and Telecommunications), and Xiaoyong Li (Beijing University of Posts and Telecommunications)
- Making Userspace TCP Stacks Transparent to Applications 651
Xiaohui Luo (Tsinghua University), Dong Liu (Tsinghua University), Xing Wu (Northwest University), Xunli Fan (Northwest University), and Fengyuan Ren (Tsinghua University)
- Robot Patrol Path Planning Based on Combined Deep Reinforcement Learning 659
Wenqi Li (Donghua University), Dehua Chen (Donghua University), and Jiajin Le (Donghua University)
- DataFall: A Policy-Driven Algorithm for Decentralized Placement and Reorganization of Replicated Data 667
Fereydoun Farrahi Moghaddam (Ericsson Research), Wubin Li (Ericsson Research), and Abdelouahed Gherbi (École de Technologie Supérieure)
- An Extensible Search Engine Platform for Efficiency Research 676
Zhaohua Zhang (Nankai University), Naiyong Ao (Nankai University), Gang Wang (Nankai University), and Xiaoguang Liu (Nankai University)
- S2R: Service Trading Based Response Time Optimization in Mobile Edge Computing 684
Pritish Mishra (SAP Labs), Mayank Tiwary (SAP Labs), Laurence T. Yang (St. Francis Xavier University), and Deepak Puthal (University of Technology Sydney)
- CRSP: Network Congestion Control through Credit Reservation 692
Tianye Yang (National University of Defense Technology), Dezun Dong (National University of Defense Technology), Cunlu Li (National University of Defense Technology), and Liquan Xiao (National University of Defense Technology)
- Enhanced Self-Coding for Available Memcached 700
Liangfeng Cheng (Huazhong University of Science and Technology), Yuchong Hu (Huazhong University of Science and Technology), Wei Wei (Huazhong University of Science and Technology), and Renzhi Xiao (Huazhong University of Science and Technology)
- A Novel Approach for Identifying Lateral Movement Attacks Based on Network Embedding 708
Mingyi Chen (Institute of Information Engineering/), Yepeng Yao (Institute of Information Engineering/), Junrong Liu (Institute of Information Engineering/), Bo Jiang (Institute of Information Engineering/), Liya Su (Institute of Information Engineering/), and Zhigang Lu (Institute of Information Engineering/)

- A Parallel Algorithm for Instruction Dependence Graph Analysis Based on Multithreading 716
Lei Wang (National University of Defense Technology), Yu Deng (National University of Defense Technology), Rui Gong (National University of Defense Technology), Wei Shi (National University of Defense Technology), Zhenyu Zhao (National University of Defense Technology), and Qiang Dou (National University of Defense Technology)
- Deadlock-Free Adaptive Routing Based on the Repetitive Turn Model for 3D Network-on-Chip 722
Yuan Cai (Tsinghua University), Dong Xiang (Tsinghua University), and Xiang Ji (Tsinghua University)
- To Compress, or Not to Compress: Characterizing Deep Learning Model Compression for Embedded Inference 729
Qing Qin (Shaanxi Normal University), Jie Ren (Shaanxi Normal University), JiaLong Yu (Northwest University), Hai Wang (Northwest University), Ling Gao (Northwest University), Jie Zheng (Northwest University), Yansong Feng (Peking University), Jianbin Fang (National University of Defense Technology), and Zheng Wang (Lancaster University)
- Dynamic Data Histogram Publishing Based on Differential Privacy 737
Ruichao Gao (Inner Mongolia University) and Xuebin Ma (Inner Mongolia University)
- A CTR Prediction Approach for Advertising Based on Embedding Model and Deep Learning 744
Shu Gao (Wuhan University of Technology), Zilong Jiang (Wuhan University of Technology), Yunhui Shi (Qiannan Normal University for Nationalities), Guanyu Wang (Qiannan Normal University for Nationalities), Liangchen Chen (China Institute of Industrial Relations), and Abdoulaye Sidibe (Wuhan University of Technology)
- Tearing Down the Face of Algorithmic Complexity Attacks for DPI Engines 751
Likun Liu (Harbin Institute of Technology), Jiantao Shi (Harbin Institute of Technology), Hongli Zhang (Harbin Institute of Technology), and Xiangzhan Yu (Harbin Institute of Technology)
- Effective Phishing Website Detection Based on Improved BP Neural Network and Dual Feature Evaluation 759
Erzhou Zhu (Anhui University), Dong Liu (Anhui University), Chengcheng Ye (Anhui University), Feng Liu (Anhui University), Xuejun Li (Anhui University), and Hui Sun (Anhui University)
- Effective Clustering Analysis Based on New Designed CVI and Improved Clustering Algorithms 766
Erzhou Zhu (Anhui University), Binbin Zhu (Anhui University), Peng Wen (Anhui University), Feng Liu (Anhui University), Xuejun Li (Anhui University), and Futian Wang (Anhui University)
- An On-the-Fly Scheduling Strategy for Distributed Stream Processing Platform 773
Wen'an Wang (Institute of Information Engineering/), Chuang Zhang (Institute of Information Engineering/), Xiaojun Chen (Institute of Information Engineering/), Zhao Li (Institute of Information Engineering/), Hong Ding (Institute of Information Engineering/), and Xin Wen (Institute of Information Engineering)
- An Effective Neural Network Phishing Detection Model Based on Optimal Feature Selection 781
Erzhou Zhu (Anhui University), Chengcheng Ye (Anhui University), Dong Liu (Anhui University), Feng Liu (Anhui University), Futian Wang (Anhui University), and Xuejun Li (Anhui University)

- A Periodic Task-Oriented Scheduling Architecture in Cloud Computing 788
Peng Zhang (Institute of Information Engineering/), Yan Li (National Computer Network Emergency Response and Coordination Center), Hailun Lin (Institute of Information Engineering/), Jianwu Wang (National Computer Network Emergency Response and Coordination Center), and Chuang Zhang (Institute of Information Engineering/)
- Bayesian Networks-Based Data Publishing Method Using Smooth Sensitivity 795
Mingzhu Li (Inner Mongolia University) and Xuebin Ma (Inner Mongolia University)
- Achieving Privacy-Preserving CP-ABE Access Control with Multi-Cloud 801
Chunhua Li (Huazhong University of Science and Technology), Jinbiao He (Huazhong University of Science and Technology), Cheng Lei (Huazhong University of Science and Technology), Chan Guo (Huazhong University of Science and Technology), and Ke Zhou (Huazhong University of Science and Technology)
- 2D Otsu Segmentation Algorithm Improvement Based on FOCPSO 809
Yingjie Zhang (Hunan University), Liang Zeng (Hunan University), Ying Zhang (Hunan University), and Jie Meng (Australian National University)
- Delay-Aware Resource Allocation for Data Analysis in Cloud-Edge System 816
Xin Li (Nanjing University of Aeronautics and Astronautics), Zhen Lian (Nanjing University of Aeronautics and Astronautics), Xiaolin Qin (Nanjing University of Aeronautics and Astronautics), and Jemal Abawajyz (Deakin University)
- An Efficient Checkpoint and Recovery Mechanism for Real-Time Embedded Systems 824
Guangqiang Luan (Beihang University), Yuebin Bai (Beihang University), Chunyang Wang (Beihang University), Junfang Zeng (Beihang University), and Qingbin Chen (Beihang University)
- Efficient VM Selection Heuristics for Dynamic VM Consolidation in Cloud Datacenters 832
Hammad Qaiser (Wuhan University of Technology) and Gao Shu (Wuhan University of Technology)
- Redis++: A High Performance In-Memory Database Based on Segmented Memory Management and Two-Level Hash Index 840
Peng Zhang (Institute of Information Engineering), Lichao Xing (Institute of Information Engineering), Ninggou Yang (Institute of Information Engineering), Guolin Tan (Institute of Information Engineering), Qingyun Liu (Institute of Information Engineering), and Chuang Zhang (Institute of Information Engineering)
- An Optimized Assisted Hybridcast Transmission Scheme in Mobile Wireless Networks 848
Weijia Jia (University of Macau) and Hanwu Wang (Hunan University)
- FATES: A Framework with Adaptive Track-Explore Strategy for Moving Targets Search by a FANET 856
Xianfeng Li (Peking University), Jie Chen (Peking University), and Jianfeng Li (Peking University)

- Peapods: OS-Independent Memory Confidentiality for Cryptographic Engines 862
Congwu Li (Data Assurance and Communication Security Research Center), Jingqiang Lin (Data Assurance and Communication Security Research Center), Quanwei Cai (Data Assurance and Communication Security Research Center), and Bo Luo (Data Assurance and Communication Security Research Center)
- Utilizing Deep Architecture Networks of VAE in Software Fault Prediction 870
Yuanyuan Sun (Institute of Information Engineering), Lele Xu (Technology and Engineering Center for Space Utilization), Ye Li (Technology and Engineering Center for Space Utilization), Lili Guo (Technology and Engineering Center for Space Utilization), Zhongsong Ma (Technology and Engineering Center for Space Utilization), and Yongming Wang (Institute of Information Engineering)
- An Energy Efficient Smartphone Pedometer Based on an Auto-Correlation Analysis 878
Runze Yang (Inner Mongolia University), Baoqi Huang (Inner Mongolia University), Jian Song (Baoshang Bank Limited), Bing Jia (Inner Mongolia University), and Wuyungerile Li (Inner Mongolia University)
- Acinonyx: Dynamic Flow Scheduling for Virtual Machine Migration in SDN-Enabled Clouds 886
Adel Nadjaran Toosi (Monash University) and Rakumar Buyya (University of Melbourne)
- A Method for Privacy-Preserving in IoT-SDN Integration Environment 895
Mehdi Gheisari (Guangzhou University), Guojun Wang (Guangzhou University), Shuhong Chen (Guangzhou University), and Ali Seyfollahi (Tabriz University)
- Web Service Recommendation Based on Word Embedding and Topic Model 903
Ting Chen (Hunan University of Science and Technology), Jianxun Liu (Hunan University of Science and Technology), Buqing Cao (Hunan University of Science and Technology), Zhenlian Peng (Hunan University of Science and Technology), Yiping Wen (Hunan University of Science and Technology), and Run Li (Hunan University of Science and Technology)
- Red Blood Cells Segmentation: A Fully Convolutional Network Approach 911
Ario Sadafi (Arivis AG), Martin Radolko (Arivis AG), Iosif Serafeimidis (Arivis AG), and Steffen Hadlak (Arivis AG)
- An OpenMP Based Parallelization Compiler for C Applications 915
Hamid Arabnejad (University of Porto), João Bispo (University of Porto), Jorge G. Barbosa (University of Porto), and João M.P. Cardoso (University of Porto)
- iSTEP, an Integrated Self-Tuning Engine for Predictive Maintenance in Industry 4.0 924
Daniele Apiletti (Politecnico di Torino), Claudia Barberis (Politecnico di Torino), Tania Cerquitelli (Politecnico di Torino), Alberto Macii (Politecnico di Torino), Enrico Macii (Politecnico di Torino), Massimo Poncino (Politecnico di Torino), and Francesco Ventura (Politecnico di Torino)
- A Cyber Risk Based Moving Target Defense Mechanism for Microservice Architectures 932
Kennedy A. Torkura (University of Potsdam), Muhammad I.H. Sukmana (University of Potsdam), and Anne V.D.M. Kayem (University of Potsdam)

- Best-Fit Containerization as a Brokered Service 940
Santonu Sarkar (Birla Institute of Technology and Science Pilani, K.K. Birla Goa Campus) and Sreekrishnan Venkateswaran (IBM Corporation)
- Predicting Execution Time of CUDA Kernel Using Static Analysis 948
Gargi Alavani (Birla Institute of Technology and Science Pilani, K.K. Birla Goa Campus), Kajal Varma (Birla Institute of Technology and Science Pilani, K.K. Birla Goa Campus), and Santonu Sarkar (ABB Corporate Research India)
- LCRC: A Dependency-Aware Cache Management Policy for Spark 956
Bo Wang (Beijing Institute of Technology University), Jie Tang (South China University of Technology), Rui Zhang (Yan'an University), Wei Ding (Henan University of Technology), and Deyu Qi (South China University of Technology)
- MWPoW - Multi-Winner Proof of Work Consensus Protocol: An Immediate Block-Confirm Solution and an Incentive for Common Devices to Join Blockchain 964
Yibin Xu (Cardiff University) and Yangyu Huang (Gulin University of Electronic Technology)
- A Neural Network Model for Cache and Memory Prediction of Neural Networks 972
Sai Sha (Peking University), Yingwei Luo (Peking University), Zhenlin Wang (Michigan Technological University), and Xiaolin Wang (Peking University)
- On the Effectiveness of Communication-Centric Modelling of Complex Embedded Systems 979
Hugo Meyer (University of Amsterdam), Uraz Odyurt (University of Amsterdam), Simon Polstra (University of Amsterdam), Evangelos Paradas (ASML Netherlands B.V.), Ignacio Gonzalez Alonso (ASML Netherlands B.V.), and Andy D. Pimentel (University of Amsterdam)
- Fog Computing with the Integration of Internet of Things: Architecture, Applications and Future Directions 987
Heena Wadhwa (Lovely Professional University & Chandigarh Engineering College) and Rajni Aron (Lovely Professional University)
- Automatic Energy Efficient HPC Programming: A Case Study 995
Issam Rais (Inria), Hélène Coullon (IMT Atlantique & Inria), Laurent Lefevre (Inria), and Christian Perez (Inria)
- Multi-Authority Ciphertext Policy Attribute-Based Encryption Scheme on Ideal Lattices 1003
Zechao Liu (Harbin Institute of Technology Shenzhen), Zoe L. Jiang (Harbin Institute of Technology Shenzhen), Xuan Wang (Harbin Institute of Technology Shenzhen), Yulin Wu (Harbin Institute of Technology Shenzhen), and S.M. Yiu (University of Hong Kong)
- HLS-Based Performance and Resource Optimization of Cryptographic Modules 1009
Arthur Silitonga (Karlsruhe Institute of Technology), Florian Schade (Karlsruhe Institute of Technology), Guanru Jiang (Karlsruhe Institute of Technology), and Juergen Becker (Karlsruhe Institute of Technology)
- Evaluation of the Use of Streaming Graph Processing Algorithms for Road Congestion Detection 1017
Zainab Abbas (KTH Royal Institute of Technology), Thorsteinn Thorri Sigurdsson (KTH Royal Institute of Technology), Ahmad Al-Shishtawy (RISE Research Institutes of Sweden), and Vladimir Vlassov (KTH Royal Institute of Technology)

Routing and Spectrum Allocation for Time Varying Traffic by Artificial Bee Colony Algorithm in Elastic Optical Networks 1026

Gang Xu (University of Chinese Academy of Sciences), Xiaoxiao Li (Huawei Technologies Co. Ltd.), Guojun Yuan (Institute of Computing Technology), Zhan Wang (Institute of Computing Technology), Guangming Tan (Institute of Computing Technology), and Xuejun An (Institute of Computing Technology)

A Business Site Selection System Using Co-Locations and Ontologies 1034

Xuguang Bao (Yunnan University) and Lizhen Wang (Yunnan University)

A Blockchain Based Online Trading System for DDoS Mitigation Services 1036

Xue Yang (Huawei Technologies), Bingyang Liu (Huawei Technologies), Fei Yang (Huawei Technologies), and Chuang Wang (Huawei Technologies)

COMEC: Computation Offloading for Video-Based Heart Rate Detection APP in Mobile Edge Computing 1038

Xuejun Li (Anhui University), Ruimiao Ding (Anhui University), Xiao Liu (Deakin University), Wenqiang Yan (Anhui University), Jia Xu (Anhui University), Han Gao (Anhui University), and Xi Zheng (Macquarie University)

Refactoring OpenMP Code Based on MapReduce Model 1040

Junfeng Zhao (Inner Mongolia University) and Minjia Zhang (Inner Mongolia University)

Code Refactoring Based on MapReduce in Cloud Migration 1042

Junfeng Zhao (Inner Mongolia University), Wenmeng Wang (Inner Mongolia University), and Hongji Yang (University of Leicester)

Network Optimizations on Prediction Server with Multiple Predictors 1044

Kaho Okuyama (Keio University), Yuta Tokusashi (Keio University), Takuma Iwata (Keio University), Mineto Tsukada (Keio University), Kazumasa Kishiki (Keio University), and Hiroki Matsutani (Keio University)

Design of a Visual Front-End for Parallel Signal Processing on Underwater Search Drone 1046

Boguslaw Cyganek (AGH University of Science and Technology) and Kazimierz Wiatr (Academic Computer Center Cyfronet AGH)

17th IEEE International Conference on Ubiquitous Computing and Communications (IUCC 2018)

A Cloud Environment for Ubiquitous Medical Image Reconstruction 1048

Estefania Serrano (University Carlos III of Madrid), Javier Garcia-Blas (University Carlos III of Madrid), and Jesus Carretero (University Carlos III of Madrid)

An Ontology Based Context-Aware Architecture for Smart Campus Applications 1056

Nicolas Verstaevael (University of Wollongong), Guillaume Garzone (Université de Toulouse), Thierry Monteil (Université de Toulouse), Nawal Guermouche (Université de Toulouse), Johan Barthelemy (University of Wollongong), and Pascal Perez (University of Wollongong)

A Technology Assisted Framework for Medical Emergencies Involving Formal and Informal Caregivers 1064

Md Akbar Hossain (Auckland University of Technology)

8th IEEE International Conference on Big Data and Cloud Computing (BDCloud 2018)

A Hybrid Indoor Localization System Running Ensemble Machine Learning 1071
Duy Nguyen Phuong (RMIT University, Vietnam) and Thanh Pham Chi (RMIT University, Vietnam)

Low Dimensional Representation of Space Structure and Clustering of Categorical Data 1079
Jianjun Cao (National University of Defense Technology), Qibin Zheng (Army Engineering University of PLA), Nianfeng Weng (National University of Defense Technology), and Xingchun Diao (Army Engineering University of PLA)

On Scheduling of High-Throughput Scientific Workflows under Budget Constraints in Multi-Cloud Environments 1087
Ruxia Li (Northwest University), Chase Q. Wu (New Jersey Institute of Technology), Aiqin Hou (Northwest University), Yongqiang Wang (Northwest University), Tianyu Gao (Northwest University), and Mingrui Xu (Northwest University)

Storage-Aware Task Scheduling for Performance Optimization of Big Data Workflows 1095
Qianwen Ye (New Jersey Institute of Technology), Chase Q. Wu (New Jersey Institute of Technology), Huiyan Cao (New Jersey Institute of Technology), Nageswara S.V. Rao (Oak Ridge National Laboratory), and Aiqin Hou (Northwest University)

Human Activity Recognition Using Federated Learning 1103
Konstantin Sozinov (KTH Royal Institute of Technology), Vladimir Vlassov (KTH Royal Institute of Technology), and Sarunas Girdzijauskas (KTH Royal Institute of Technology)

Radix: Enabling High-Throughput Georeferencing for Phenotype Monitoring over Voluminous Observational Data 1112
Sangmi Pallickara (Colorado State University) and Maxwell Roselius (Colorado State University)

Fog Computing and Its Role in Development of Smart Applications 1120
Mandeep Kaur Saroa (Lovely Professional University) and Rajni Aron (Lovely Professional University)

11th IEEE International Conference on Social Computing and Networking (SocialCom 2018)

Estimating Top-k Betweenness Centrality Nodes in Online Social Networks 1128
Kazuki Nakajima (Tokyo Institute of Technology), Kenta Iwasaki (Tokyo Institute of Technology), Toshiki Matsumura (Tokyo Institute of Technology), and Kazuyuki Shudo (Tokyo Institute of Technology)

Comparing Graph Sampling Methods Based on the Number of Queries 1136
Kenta Iwasaki (Tokyo Institute of Technology) and Kazuyuki Shudo (Tokyo Institute of Technology)

- Dynamic CNN Models for Fashion Recommendation in Instagram 1144
Shatha Jaradat (KTH Royal Institute of Technology), Nima Dokoohaki (KTH Royal Institute of Technology), Kim Hammar (KTH Royal Institute of Technology), Ummul Wara (KTH Royal Institute of Technology), and Mihhail Matskin (KTH Royal Institute of Technology)
- The Incorporation of Social Media in an Emergency Supply and Demand Framework in Disaster Response 1152
Meng Seng Wong (University of Nottingham Malaysia Campus), Nishimoto Hideki (Ryukoku University), and Nishigaki Yasuyuki (Ryukoku University)
- A Novel Graph Analytic Approach to Monitor Terrorist Networks 1159
Kaustav Basu (Arizona State University), Chenyang Zhou (Arizona State University), Arunabha Sen (Arizona State University), and Victoria Horan Goliber (Arizona State University)
- On the Usability of Big (Social) Data 1167
Sunil Choenni (Rotterdam University of Applied Sciences), Niels Netten (Rotterdam University of Applied Sciences), Mortaza Shoaie-Bargh (Rotterdam University of Applied Sciences), and Rochelle Choenni (Institute for Logic, Language and Computation)
- Deriving the Political Affinity of Twitter Users from Their Followers 1175
Giorgos Stamatelatos (Democritus University of Thrace), Sotirios Gyftopoulos (Democritus University of Thrace), George Drosatos (Democritus University of Thrace), and Pavlos S. Efraimidis (Democritus University of Thrace)
- Predicting Hacker Adoption on Darkweb Forums Using Sequential Rule Mining 1183
Ericsson Marin (Arizona State University), Mohammed Almukaynizi (Arizona State University), Eric Nunes (Arizona State University), Jana Shakarian (Cyber Reconnaissance, Inc.), and Paulo Shakarian (Arizona State University & Cyber Reconnaissance, Inc.)
- Negotiating Consumerism and Feminism on Instagram 1191
Mathilde Hogsnes (Mildh Beauty Press & Kristiania University College) and Kjeld Hansen (Kristiania University College & Copenhagen Business School)

Author Index