2019 Seventh International Conference on Advanced Cloud and Big Data (CBD 2019)

Suzhou, China 21 – 22 September 2019



IEEE Catalog Number: CFP1903Y-POD ISBN:

978-1-7281-5142-7

Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

 IEEE Catalog Number:
 CFP1903Y-POD

 ISBN (Print-On-Demand):
 978-1-7281-5142-7

 ISBN (Online):
 978-1-7281-5141-0

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



2019 Seventh International Conference on Advanced Cloud and Big Data (CBD) CBD 2019

Table of Contents

Message from the Conference Chairs xiii Message from the Program Chairs xiv CBD 2019 Organizing Committee xv CBD 2019 Program Committee xvi CBD 2019 Reviewers xix Organizers and Sponsors xxii	
Session 1: Cloud Computing and Applications I	
Communication Optimization of Compute-Intensive Clusters Based on Software-Defined Networks .1	
An Adaptive Heuristic for Scheduling Dynamic and Fuzzy Jobs on Elastic Clouds .7. Jie Zhu (Nanjing University of Posts & Telecommunications), Han Liu (Nanjing University of Posts & Telecommunications), and Haiping Huang (Nanjing University of Posts & Telecommunications)	
PCP-2LSTM: Two Stacked LSTM-Based Prediction Model for Power Consumption in Data Centers .13	
An Adaptive Virtual Machine Placement Gaussian Model and Method .19	
Predicting QoS for Cloud Services through Prefilling-Based Matrix Factorization .25	
Efficient Gradient Descent via Value Staleness Analysis for Heterogeneous Deep Learning Systems 3.1 Enting Guo (Nanjing University of Posts and Telecommunications), Kun Wang (University of California, Los Angeles), and Yan Zhang (University of Oslo)	

Decomposition Based Multi-objective Workflow Scheduling for Cloud Environments 37. Emmanuel Bugingo (Xiamen University, China), Wei Zheng (Xiamen University, China), Dongzhan Zhang (Xiamen University, China), Yingsheng Qin (Xiamen University, China), and Defu Zhang (Xiamen University, China) University, China)
Session 2: Cloud Computing and Applications II
A Coordinated Two-Stages Virtual Network Embedding Algorithm Based on Reinforcement Learning .43 Cong Wang (Northeastern University at Qinhuangdao), Fanghui Zheng (Northeastern University at Qinhuangdao), Sancheng Peng (Guangdong University at of Foreign Studies), Zejie Tian (Northeastern University at Qinhuangdao), Yujia Guo (Northeastern University at Qinhuangdao), and Ying Yuan (Northeastern University at Qinhuangdao)
Optimization of POM Based on Parallel Supercomputing Grid Cloud Platform .49. Hongtao Guan (Chengdu University of Information Technology), Xiaofeng Dong (Chengdu University of Information Technology), Chen Xue (Chengdu University of Information Technology), Zhirong Luo (Chengdu University of Information Technology), Hao Yang (Chengdu University of Information Technology), and Tao Wu (Chengdu University of Information Technology)
Pipe-Torch: Pipeline-Based Distributed Deep Learning in a GPU Cluster with Heterogeneous Networking .55 Jun Zhan (Southeast University, China) and Jinghui Zhang (Southeast University, China)
Model-Aware Parallelization Strategy for Deep Neural Networks' Distributed Training .6.1
Resource Waste-Aware Dynamic Workflow Scheduling in Multicluster .67. Chang Shi (No. 28 Institute of CETC, Nanjing, China), Feng Zhu (No. 28 Institute of CETC, Nanjing, China), Yuqi Li (No. 28 Institute of CETC, Nanjing, China), and Jinghui Zhang (Southeast University, Nanjing, China)
Probability Distribution Based Resource Management for Transient Resource .72. Jun Zhou (Huazhong University of Science and Technology (HUST); Wuhan National Laboratory for Optoelectronics (WNOL)), Dan Feng (Huazhong University of Science and Technology (HUST); Wuhan National Laboratory for Optoelectronics (WNOL)), and Fang Wang (Huazhong University of Science and Technology (HUST); Wuhan National Laboratory for Optoelectronics (WNOL))
Spot Price Prediction Based Dynamic Resource Scheduling for Web Applications .78. Duan Liu (Nanjing University of Science and Technology, China), Zhicheng Cai (Nanjing University of Science and Technology, China), and Yifei Lu (Nanjing University of Science and Technology, China)
Execution Feature Extraction and Prediction for Large-Scale Graph Processing Applications .84

Session 3: Big Data and Applications I

Improving NoSQL's Performance Metrics via Machine Learning 90. Wen Xiong (Yunnan Normal University), Kun Yang (Yunnan Normal University), and Hao Dai (Shenzhen Institute of Beidou Applied Technology)
Algorithm for Mining Network-Constrained Movement Patterns between Zones from Spatiotemporal OD
Flows .96
Discovering Hotspots in Dynamic Spatial Networks Using Mobility Data .102. Jinping Jia (Nanjing Normal University), Shengxi Tan (Nanjing Normal University), Genlin Ji (Nanjing Normal University), and Bin Zhao (Nanjing Normal University)
Mining Group Periodic Moving Patterns from Spatio-Temporal Trajectories .108
SimG: A Semantic Based Graph Similarity Search Engine 114. Haijiang Yan (Hangzhou Dianzi University, China), Yuxiang Wang (Hangzhou Dianzi University, China), and Xiaoliang Xu (Hangzhou Dianzi University, China)
Timo: In-Memory Temporal Query Processing for Big Temporal Data .121. Xiao Zheng (Anhui University of Technology, China), Hou-kai Liu (Anhui University of Technology, China), Lin-na Wei (Anhui University of Technology, China), Xuan-gou Wu (Anhui University of Technology, China), and Zhen Zhang (Anhui University of Technology, China)
Session 4: Big Data and Applications II
Identification of Essential Proteins by Using Complexes and Biological Information on Dynamic PPI
Network .127
Leveraging SMOTE in a Two-Layer Model for Prediction of Protein-Protein Interactions .133
AIDec: An Algorithm for Detecting Allelic Imbalance Based on the Sequenom MassArray Platform .139 Meng Wang (Jiangsu University of Science and Technology)
Large Area Building Detection from Airborne Lidar Data using OSM Trained Superpixel Classification .145 Bo Mao (Nanjing University of Finance and Economics), Bingchan Li (Jiangsu Maritime Institute), and Jiayue Sun (State Grid Qingdao Power Supply Company)

Application of Improved Grey Theory Prediction Model in Medium-Term Load Forecasting of Distribution
Network 151
Session 5: Social Computing and Applications
A Two-Level Edge-Knowledge Learning Genetic Algorithm for Community Detection .156. Saisai Liu (Nanjing University of Aeronautics and Astronautics) and Zhengyou Xia (Nanjing University of Aeronautics and Astronautics)
Data Placement Cost Optimization and Load Balancing for Online Social Networks .162
Switching Strategy of Recommendation Algorithms in Online Dating Platform .168
Session 6: Cloud Security and Privacy
Research on Privacy Protection with Weak Security Network Coding for Mobile Computing .17.4
LSTM-BA: DDoS Detection Approach Combining LSTM and Bayes .180
A Zero-Shot Intrusion Detection Method Based on Regression Model .186. Xiao Zhang (Northwest University, China), Ling Gao (Xi'an Polyteching University, China), Yang Jiang (Northwest University, China), Xudong Yang (Northwest University, China), Jie Zheng (Northwest University, China), and Hai Wang (Northwest University, China)
A Minimum Defense Cost Calculation Method for Cyber Physical System .192. Bingfeng Xu (Nanjing Forestry University), Zhicheng Zhong (Nanjing Forestry University), and Gaofeng He (Nanjing University of Posts and Telecommunications and Key Laboratory of Computer Network and Information Integration (Southeast University))
An Attribute Revocable CP-ABE Scheme .198. Guangli Xiang (Wuhan University of Technology), Beilei Li (Wuhan University of Technology), Xiannong Fu (FileStorm Technology (Shenzhen) Co., Ltd.), Mengsen Xia (Wuhan University of Technology), and Weiyi Ke (Wuhan University of Technology)
An Approach of Code Pointer Hiding Based on a Resilient Area .204. Feng Xuewei (Nation Key Laboratory of Science and Technology on Information System Security), Wang Dongxia (Nation Key Laboratory of Science and Technology on Information System Security), and Lin Zhechao (Nation Key Laboratory of Science and Technology on Information System Security)

Network Penetration Identification Method Based on Interactive Behavior Analysis .210	
A Semantic k-Anonymity Privacy Protection Method for Publishing Sparse Location Data .216	
Session 7: Machine Learning & Data Mining I	
Multi-layer LSTM Network Statement Generation Based on Mixed Input .223	
A Fusion Method for Word Vector Based on Fasttext-KdTree .229. Yu Dai (Northeastern University), Hongcui Hua (Northeastern University), Chenyan Ma (Northeastern University), Huixue Zhang (Northeastern University), and Lei Yang (Northeastern University)	•••••
Brain Tissue Segmentation Integrating Multi-level Features .235. Fei Wu (Southeast University, China), YiFei Li (Southeast University, China), Jian Zhu (Shandong Academy of Medical Sciences, China), Bin Zhou (Southeast University, China), Youyong Kong (Southeast University, China; International Joint Research Laboratory of Information Display and Visualization, Southeast University, Nanjing, China; Key Laboratory of Computer Network and Information Integration, Southeast University, China), and Huazhong Shu (Southeast University, China; International Joint Research Laboratory of Information Display and Visualization, Southeast University, Nanjing, China; Key Laboratory of Computer Network and Information Integration, Southeast University)	
An Intelligent Bidding Strategy Based on Model-Free Reinforcement Learning for Real-Time Bidding i Display Advertising .240	n
Feature Selection Based on the Kullback-Leibler Distance and its Application on Fault Diagnosis .246 Yangtao Xue (Soochow University, China), Li Zhang (Soochow University, China), Bangjun Wang (Soochow University, China), and Fanzhang Li (Soochow University, China)	

Modulated Binary Clique Convolutional Neural Network 252. Jinpeng Xia (Southeast University, China), Jiasong Wu (Southeast University, China), Fuzhi Wu (Southeast University, China), Youyong Kong (Southeast University, China), Pinzheng Zhang (Southeast University, China), Lotfi Senhadji (Université de Rennes 1, France), and Huazhong Shu (Southeast University, China) **Session 8: Machine Learning & Data Mining II** A Matrix-Decomposition-Based Context Tensor Approach for Personalized Travel Time Estimation .258...... Xiaopei Li (Soochow University, China), Fanzhang Li (Soochow University, China), Xin Dai (Soochow University, China), and Helan Liang (Soochow University, China) Flotation Fault Diagnosis Method Using Statistical Approaches .266. Jin Zhang (Central South University, China), Zhaohui Tang (Central South University, China), Yongfang Xie (Central South University, China), Mingxi Ai (Central South University, China), and Weihua Gui (Central South University, China) Multi-task Learning Based on Question-Answering Style Reviews for Aspect Category Classification and Aspect Term Extraction 272 Hangian Wu (Southeast University, China), Zhike Wang (Southeast University, China), Mumu Liu (Southeast University, China), and Jingyu Huang (State Grid HeBei Information Telecommunication Branch, China) Multi-feature Fusion Action Recognition Based on Key Frames 279. Yuerong Zhao (Northwest University), Ling Gao (Northwest University, Xi'an Polytechnic University), Dan He (Northwest University), Hongbo Guo (Northwest University), Hai Wang (Northwest University), Jie Zheng (Northwest University), and Xudong Yang (Northwest University) Optimization for Mobile Streaming Media Based on Deep Q-Learning .285..... ZiXin Zhao (Northwest University), Ling Gao (Xi'an Polytechnic University), Jie Ren (Shaanxi Normal University), Lu Yuan (Northwest University), ChenGuang Qin (Northwest University), Hai Wang (Northwest University), and Jie Zheng (Northwest University) Short-Term Prediction of Generator Blade Ice Fault Based on Multi-AN 291. Cheng Peng (Hunan University of Technology, Central South University), Qing Chen (Hunan University of Technology), Songsong Wang (Hunan University of Technology), Zhaohui Tang (Central South University), Xiaohong Zhou (Hunan University of Technology), and Hao Chi (Hunan *University of Technology)* **Session 9: Machine Learning & Data Mining III** Defect Detection and Classification for Plain Woven Fabric Based on Deep Learning 297. Miao Guan (Soochow University, China), Zhaozhun Zhong (Soochow University, China), Yannian Rui (Soochow University, China), Hongjing Zheng (Soochow Vocational University, China), and Xiongjun Wu (The Eighth Academy of China Aerospace Science and Technology Corporation,

China)

TW-Co-MFC: Two-Level Weighted Collaborative Multi-view Fuzzy Clustering Based on Maximum Entropy .303 Jie Hu (Southwest Jiaotong University, China), Yi Pan (Georgia State University), Tianrui Li (Southwest Jiaotong University, China), and Yan Yang (Southwest Jiaotong University, China)
Mild Cognitive Impairment Identification Based on Multi-View Graph Convolutional Networks .309 Jin Liu (Central South University), Dejiao Zeng (Central South University), Mingming Lu (Central South University), and Jianxin Wang (Central South University)
Crowd Counting via Residual Multi-Scale Convolutional Neural Network .3.15. Jingang Lu (Soochow University, China) and Li Zhang (Soochow University, China)
RTSRGAN: Real-Time Super-Resolution Generative Adversarial Networks 321. Xiaoyan Hu (Southeast University, China), Xiangjun Liu (Southeast University, China), Zechen Wang (Southeast University, China), Xinran Li (Southeast University, China), Wenqiang Peng (Southeast University, China), and Guang Cheng (Southeast University, China)
Session 10: Edge Computing and & Miscellaneous
ScaRL: Service Function Chain Allocation Based on Reinforcement Learning in Mobile Edge Computing .327. Qizhen Jin (Tianjin University, China), Shuxin Ge (Tianjin University, China), Jiaxin Zeng (Tianjin University, China), Xiaobo Zhou (Tianjin University, China), and Tie Qiu (Tianjin University, China)
Task Offloading for Social Sensing Applications in Mobile Edge Computing .333
Computation Tasks Offloading Scheme Based on Multi-cloudlet Collaboration for Edge Computing .339 Qingyong Wang (Hohai University, China), Yingchi Mao (Hohai University, China), Yichao Wang (Hohai University, China), and Longbao Wang (Hohai University, China)
Light-Weight Rate Adaptation in Passive Sensing System 345
Energy-Efficient Link Scheduling with Load Constraints in Dual-Hop 60GHz Wireless Networks .351
CBFSketch: A Scalable Sketch Framework for High Speed Network .357

Performance Analysis of BBR Congestion Control Protocol Based on NS3 .363.
Hao Zhang (Nanjing University of Posts and Telecommunications),
Haiting Zhu (Nanjing University of Posts and Telecommunications), Yu
Xia (Nanjing University of Posts and Telecommunications), Lu Zhang
(Nanjing University of Finance and Economics), Yuan Zhang (Nanjing
University of Posts and Telecommunications), and Yingying Deng
(Nanjing University of Posts and Telecommunications)
Author Index 369