2016 15th International Symposium on Parallel and Distributed Computing (ISPDC 2016)

Fuzhou, China
8-10 July 2016
2016 15th International Symposium on Parallel and Distributed Computing

ISPDC 2016

Table of Contents

Message from the General Chairs .............................................................................................................xi
Organizing Committee ...............................................................................................................................xii
Program Committee ..................................................................................................................................xiii
Reviewers ...................................................................................................................................................xv

Section 1: System Architectures for Parallel and Distributed Computing

Evaluating Multi-core and Many-Core Architectures through Accelerating an Alternating Direction Implicit CFD Solver .................................................................1
   Liang Deng, Jianbin Fang, Fang Wang, and Hanli Bai

Reliability and Performance Evaluation of Joint Redundancy and Inspection-Based Maintenance Strategy in Virtualized System .................................................................11
   Pan He, Yue Yuan, Xiaoguang Lin, and Xueliang Zhao

Neural Network Based Virtual Machine Network Bandwidth Prediction ................................................19
   Yurui Lin, Riqing Chen, and Changcai Yang

Section 2: Parallel Computing and Algorithms

Applying Victim Cache in High Performance GPGPU Computing ..........................................................24
   Fengfeng Fan, Jianfei Wang, Li Jiang, Xiaoyao Liang, and Naifeng Jing

Massive Parallel Fluid Flow Simulations Using Hierarchical Data Format Version 5 (HDF5) .................................................................30
   Christoph Ertl, Jérôme Frisch, and Ralf-Peter Mundani

Scalability Challenges in Current MPI One-Sided Implementations .....................................................38
   Xin Zhao, Pavan Balaji, and William Gropp

Finding SCCs in Real-World Graphs on External Memory: A Task-Based Approach ................................48
   Huiming Lv, Zhiyuan Shao, Xuanhua Shi, and Hai Jin
A Hybrid CPU+GPU Working-Set Dictionary .................................................................56  
Ziaul Choudhury, Suresh Purini, and Shiva Rama Krishna

Large Scale Parallel Computing for Fluid Dynamics on Unstructured Grid ..................64  
Jing Tang, Bin Li, Jiangtao Chen, and Xiaoquan Gong

Research on Three-Dimensional Parallel Modeling Algorithm with Movable  
Point Cloud Data ........................................................................................................70  
Liuyang Fang and Jie Chen

Parallel Implementation of the Range-Doppler Radar Processing on a GPU  
Architecture .............................................................................................................76  
Guanghui Zhao, Yongfei Liu, Shuping Zhang, Fangfang Shen, Yaohai Lin,  
and Guangming Shi

SWIFT-A Performance Accelerated Optimized String Matching Algorithm  
for Nvidia GPUs ....................................................................................................80  
Sourabh S. Shenoy, U. Supriya Nayak, and Bayyapu Neelima

The 3-POCs Structure Based GPU Acceleration in Computational Spectral  
Imaging ...................................................................................................................88  
Xuewen Geng, Yufei Guo, Lin Liu, Yi Niu, and Guangming Shi

Section 3: Cloud Computing

Using Social Media and the Mobile Cloud to Enhance Emergency and Risk  
Management .........................................................................................................92  
Hazzaa Naif Alshareef and Dan Grigoras

Adaptive Anomaly Detection in Cloud Using Robust and Scalable Principal  
Component Analysis .............................................................................................100  
Bikash Agrawal, Tomasz Wiktorski, and Chunming Rong

Distributed and Parallel Delaunay Triangulation Construction with Balanced  
Binary-tree Model in Cloud ..................................................................................107  
Jiaxiang Lin, Riqing Chen, Changcai Yang, Zhaogang Shu, Changying Wang,  
Yaohai Lin, and Leping Wu

Distributed Safety Verification Using Vertex Centric Programming Model ................114  
Adhish Singla, Krishnaji Desai, Suresh Purini, and Venkatesh Choppella

A Novel Performance Evaluation and Optimization Model for Big Data System ........121  
Jungang Xu, Guolu Wang, Shengyuan Liu, and Renfeng Liu

The Research on User Experience Design of Android System’s Control Key ............131  
Minghui Hu, Zhiru Xu, and Lili Feng

An Android/OSGi-Based Mobile Gateway for Body Sensor Network .......................135  
Zhi Wang, Rui-Chun Hou, and Zhi-Ming Zhou
The Implementation of Sensor Data Access Cloud Service on HBase
for Intelligent Indoor Environmental Monitoring .................................................................234
  Yun-Ting Wang, Yuan-Pin Chiang, Chien-Heng Wu, Chao-Tung Yang,
  Shuo-Tsung Chen, and Pei-Lun Sun

Queries over Large-Scale Log Data of Hybrid Granularities ........................................240
  Gansen Zhao, Xutian Zhuang, Xinming Wang, Ruihua Nie, Zhirui Liao,
  Chengchuang Lin, and Zhenyu Li

Smart Home Security Monitor System ...........................................................................247
  Xin Hong, Chenhui Yang, and Chunming Rong

Correctness Verification of Outsourced Inner Product of Vectors with Error
Localiza tion ...................................................................................................................252
  Gang Sheng, Chunming Tang, Hongyan Han, and Ying Yin

Auditing Covert Communication between Applications on Android ...........................257
  Weizhong Qiang, Shifan Xin, Hai Jin, Xinqiao Lv, and Qin Zhang

Highly Efficient Proxy Re-encryption Schemes for User-End Encrypted Cloud
Data Sharing .................................................................................................................261
  Xing Hu, Chunming Tang, and Duncan S. Wong

Securely Outsourced Face Recognition under Federated Cloud Environment ..............269
  Yunlu Cai and Chunming Tang

Ranking Node Influence in Social Networks ..................................................................277
  Zheyi Chen, Yuli Liu, and Weiping Zhu

Section 4: Performance Modeling, Management,
and Optimization

A Privacy-Preserving Approach Based on Graph Partition for Uncertain
Trajectory Publishing ......................................................................................................285
  Jianchuan Xiao, Li Xu, Limei Lin, and Xiaoding Wang

Optimizing Protein Folding Simulation on Intel Xeon Phi ............................................291
  Kun Huang and Yifeng Chen

An Optimized DHT for Linux Package Distribution .......................................................298
  Qi Zhang, Jie Yu, Lei Luo, Jun Ma, Qingbo Wu, and Shasha Li

A New Approach to Modeling and Analyzing Timed Compatibility of Service
Composition under Temporal Constraints ....................................................................306
  Yanxue Xing, Sujian Li, Yanhua Du, and Helan Liang

A Continuous Self-Checking Validation Framework on Processor Exceptions ...............314
  Tan Jian and Li Daifeng

Race Condition and Deadlock Detection for Large-Scale Applications ........................319
  Anh-Tu Do-Mai, Thanh-Dang Diep, and Nam Thoai
Section 5: Multimedia Data Processing

Protein Function Detection Based on Machine Learning: Survey and Possible Solutions ...................................................................................................................................................327

Kun Li, Xianghan Zheng, Chunming Rong, Yuanlong Yu, and Riqing Chen

Adaptive Fuzzy Control of Leader-Follower High-Order Nonlinear Multi-agent Systems with Actuator Faults ..........................................................................................................................................................................................................................334

Ning Zhou, Riqing Chen, Yuanqing Xia, and Jie Huang

Multi-agent Network and Cellular Automata Based Resources Assignment for City Educational System ..................................................................................................................................................340

Jie Huang, Ning Zhou, and Riqing Chen

Hardware-Efficient Architecture of Photo Core Transform in JPEG XR for Low-Cost Applications .................................................................................................................................................................344

Shuiping Zhang, Huabing Zhou, Haihui Wang, and Xia Hua

Research on Monocular Visual Odometry Based on 3D-2D Motion Estimation .................................................................................................................................................................................................349

Yao Zhang and Yanduo Zhang

Human Action Recognition of Hidden Markov Model Based on Depth Information ..........................................................................................................................................................................................354

Tongwei Lu, Ling Peng, and Shaojun Miao

A 3D Map Reconstruction Algorithm in Indoor Environment Based on RGB-D Information .................................................................................................................................................................................358

Bo Yuan and Yanduo Zhang

Character Recognition Based on PCANet ..........................................................................................................................................................................................................................................................364

Renjun Liu and Tongwei Lu

Face Recognition Based on LBP and LNMF Algorithm ........................................................................................................................................................................................................................................368

Menglu Wu and Tongwei Lu

Animation Generating Based on MRLS Image Deformation .................................................................................................................................................................................................................................372

Ren Shiqiang, Zhou Huabing, Li Zhengjun, and Wang Tao

An Image-Based Approach to Automatic Crop Organ Extraction via Low-Rank Matrix Recovery ...........................................................................................................................................................................376

Zhenghong Yu, Haichang Yin, Haijie Feng, Minfang Chen, Huabing Zhou, Tongwei Lu, and FengMin

Non-rigid Point Set Registration via Coherent Spatial Mapping and Local Structures Preserving ........................................................................................................................................................................382

Meifang Zhang, Changcai Yang, Lifang Wei, Zejun Zhang, Riqing Chen, and Huabing Zhou

Convolutional Neural Network Based Transient Earth Voltage Detection .................................................................................................................................................................................................386

Yuan Lu, Ruifeng Wei, Jingrui Chen, and Jun Yuan