2015 IEEE Fifth International Conference on Big Data and Cloud Computing

BDCloud 2015

Table of Contents

Message from BDCloud 2015 General Chairs................................................................. xi
Message from BDCloud 2015 Program Chairs.............................................................. xii
Message from AEIT 2015 Workshop Chairs .................................................................... xiii
Message from IBDC 2015 Workshop Chairs .................................................................. xiv
Message from ETCS 2015 Workshop Chairs .................................................................. xv
BDCloud 2015 Conference Organization ..................................................................... xvi
BDCloud 2015 Program Committee ............................................................................. xvii
Keynotes .................................................................................................................... xix

BDCloud 2015: The Fifth IEEE International Conference on Big Data and Cloud Computing

Performance Characterization of In-Memory Data Analytics on a Modern Cloud Server ......................................................... 1
  Ahsan Javed Awan, Mats Brorsson, Vladimir Vlassov, and Eduard Ayguade

Pipeline Item-Based Collaborative Filtering Based on MapReduce ............................................. 9
  Zhi-Lin Zhao, Chang-Dong Wang, Yuan-Yu Wan, Zi-Wei Huang, and Jian-Huang Lai

A Scalable Algorithm for Bichromatic Reverse Nearest Neighbor with Grids .......................... 15
  Changqing Ji, Yuanyuan Li, Junfeng Wu, Wenyu Qu, Zhiyang Li, Sunying Gao, and Sheng Yu

Efficient k-Nearest Neighbors Search in High Dimensions Using MapReduce .......................... 23
  Pingfei Zhu, Xiangwen Zhan, and Wenming Qiu

Fast Memory Deduplication of Disk Cache Pages in Virtual Environments .......................... 31
  Yan Niu, Wei Liu, Fei Xiang, and Lihong Wang

Energy-Efficient Storage Policy for Instant Messenger Services ........................................ 38
  Jaemyoun Lee, Chang Song, and Kyungtae Kang
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDenDist: Nonlinear Hierarchical Clustering Based on Density and Min-distance</td>
<td>45</td>
</tr>
<tr>
<td>Wen-Qi Fan, Chang-Dong Wang, Yuan-Wei Chen, and Jian-Huang Lai</td>
<td></td>
</tr>
<tr>
<td>A Hierarchical Collocation Extraction Tool</td>
<td>51</td>
</tr>
<tr>
<td>Dan Li, Jiangxiang Cao, and Degen Huang</td>
<td></td>
</tr>
<tr>
<td>Efficient Key Management for IOT Owner in the Cloud</td>
<td>56</td>
</tr>
<tr>
<td>Zongmin Cui, Haitao Lv, Chao Yin, Guangyong Gao, and Caixue Zhou</td>
<td></td>
</tr>
<tr>
<td>Energy Efficiency in Virtual Machines Allocation for Cloud Data Centers</td>
<td>62</td>
</tr>
<tr>
<td>Reza Asemi, Elahe Doostsadigh, Mahmoud Ahmadi, and Hadi Tabatabaee Malazi</td>
<td></td>
</tr>
<tr>
<td>WindTalker: An Efficient and Robust Protocol of Cloud Covert Channel Based on Memory Deduplication</td>
<td>68</td>
</tr>
<tr>
<td>Hong Rong, Huimei Wang, Jian Liu, Xiaochen Zhang, and Ming Xian</td>
<td></td>
</tr>
<tr>
<td>Optimal Fault Tolerance Strategy Selection for Application Migration in Federated Hybrid Cloud</td>
<td>76</td>
</tr>
<tr>
<td>Wei Guo and Jinyan Li</td>
<td></td>
</tr>
<tr>
<td>RSAE: Ranked Keyword Search over Asymmetric Encrypted Cloud Data</td>
<td>82</td>
</tr>
<tr>
<td>Cheng Guo, Qiongqiong Song, Ruhan Zhuang, and Bin Feng</td>
<td></td>
</tr>
<tr>
<td>cUpdate: Updating Software-Defined Networks with the Least Traffic Migration</td>
<td>87</td>
</tr>
<tr>
<td>Ting Qu, Lailong Luo, Zhiyao Hu, Liang Shi, Junjie Xie, and Deke Guo</td>
<td></td>
</tr>
<tr>
<td>Price Trend Prediction of Stock Market Using Outlier Data Mining Algorithm</td>
<td>93</td>
</tr>
<tr>
<td>Lei Zhao and Lin Wang</td>
<td></td>
</tr>
<tr>
<td>The Reform of Vocational Colleges’ Teaching Method in the Age of Big Data—Based on PHP Programming</td>
<td>99</td>
</tr>
<tr>
<td>Xiangyi Li and Yanheng Li</td>
<td></td>
</tr>
<tr>
<td>Delay-Aware Associate Tasks Scheduling in the Cloud Computing</td>
<td>104</td>
</tr>
<tr>
<td>Mao Yingchi, Xu Ziyang, Ping Ping, and Wang Longbao</td>
<td></td>
</tr>
<tr>
<td>Design Issues of Trustworthy Cloud Platform Based on IP Monitoring and File Risk</td>
<td>110</td>
</tr>
<tr>
<td>Shin-Jer Yang and I-Chen Cheng</td>
<td></td>
</tr>
<tr>
<td>A Floating Population Prediction Model in Travel Spots Using Weather Big Data</td>
<td>118</td>
</tr>
<tr>
<td>Kyungmin Lee, Bonghee Hong, Jiwan Lee, and Yangja Jang</td>
<td></td>
</tr>
<tr>
<td>Predicting Spatiotemporal Traffic Flow Based on Support Vector Regression and Bayesian Classifier</td>
<td>125</td>
</tr>
<tr>
<td>Jin Young Ahn, Eunjeong Ko, and EunYi Kim</td>
<td></td>
</tr>
<tr>
<td>Dynamic Fair Division of Multiple Resources with Satiable Agents in Cloud Computing Systems</td>
<td>131</td>
</tr>
<tr>
<td>Xi Liu, Xiaolu Zhang, Xuejie Zhang, and Weidong Li</td>
<td></td>
</tr>
</tbody>
</table>
# ISBN 978-1-4939-3825-1

*AEIT 2015: The 2015 International Workshop on Assistive Engineering and Information Technologies*

## A Corrected Hybrid Approach for Electricity Demand Forecasting

**Tingting Zhao**

## Design Optimization for Cloud Application Migration and Remigration

**Wei Guo and Jinyan Li**

## SAACO: A Self Adaptive Ant Colony Optimization in Cloud Computing

**Weifeng Sun, Zhenxing Ji, Jianli Sun, Ning Zhang, and Yan Hu**

## System Capacity Analysis on Constellation of Interconnected HAP Networks

**Feihong Dong, Yuanzhi He, Haitao Nan, Zongsheng Zhang, and Jingchao Wang**

## Personal Data Lake with Data Gravity Pull

**Coral Walker and Hassan Alrehamy**

## Knowledge Management in Big Data Times

**Yang XU**

## A Secure and Lightweight Data Access Control Scheme for Mobile Cloud Computing

**Yu Jin, Chuan Tian, Heng He, and Fan Wang**

## Dynamic Token Based Improving MapReduce Performance in Cloud Computing

**Mosong Zhou, Heng Chen, Xiaoshe Dong, and Zhengdong Zhu**

## The Blockchain-Based Digital Content Distribution System

**Junichi Kishigami, Shigeru Fujimura, Hiroki Watanabe, Atsushi Nakadaira, and Akihiko Akutsu**

## The Research of Human-Computer Interaction Model Based on the Morhpable Model Based 3D Face Synthesis in the Speech Rehabilitation for Deaf Children

**Zhao Jian, Shi Lijuan, Wang Lirong, Lin Jun, Du Qinseng, and S.V. Shalobanov**

## Face Mount Computer Input Device for Serious Disabled

**Jiangli Yu, Takakazu Ishimatsu, Naoya Shiraishi, Murray Lawn, Chao Zhang, and Motohiro Tanaka**

## Design of Remote Medical Monitoring System Based on ZigBee Technology

**Dawei Xu, Ping Feng, Shan Ren, and Lirong Wang**

## Design of Measurement System for Respiratory Training Device Based on Speech Training for Hearing-Impaired Children

**Shi Lijuan, Zhao Jian, Wang Lirong, An Zhiyong, Shang Biao, and Li Hao**

## Structural Health Monitoring WTB Using the Effectiveness of Graphical Programming Packages Analysis on Acoustic Emission Data

**Qin Hongwu, Sun Haixin, Chu Wei, and Duan Mengcong**
Application of Improved Spectral Subtraction Algorithm for Speech Emotion Recognition ................................................................. 213
  Zhang Wanli, Li Guoxin, and Wang Lirong

Multiple Access Applications of Transform Domain Communication System Based on Phase Coding .............................................................. 217
  Haixin Sun, Fucheng Cao, and Hongwu Qin

Application of the Improved Variable Arguments PID in Asymmetric Hydraulic Cylinder Electro-hydraulic Servo System ........................................ 223
  Zhang Wanli, Li Guoxin, and Wang Lirong

Application of OPC to Realize the Communications between WinCC and Master-Slave PLC in the PROFIBUS Network ........................................ 227
  Li Guoxin, Zhang Wanli, and Wang Lirong

Design of Doppler Radar Microwave Transmitting Unit .................................................. 231
  Liye Ren and Xiaoli Wang

An ISBN Code Number Recognition Algorithm Based on Android ........................................ 235
  Ping Feng, Dawei Xu, and Xiaoli Wang

Construction and Research of Braille Corpus .................................................................. 239
  Shiquan Dai, Xiaomei Zhang, Yu Shun, Gui Mei, and Ming Xu

A Feature Point Matching Algorithm for Complex Background Image ............................. 243
  Xiaoli Wang, Dongmei Liu, and Lirong Wang

Research on Current Situation of Perceived Self-Efficacy of Hearing-Impaired Students Majoring in Artistic Specialties ........................................ 248
  Zhao Gang and Xueyan Wang

Eye Detection Based on Integral Projection and Hough Round Transform ............................ 252
  Chen Dong, Xiaoli Wang, Chen Pei-hua, and Yang Pu-Liang

Face Detection under Particular Environment Based on Skin Color Model and Radial Basis Function Network ...................................................... 256
  Chen Dong, Xiaoli Wang, Tao Lin, and Li Mei-cheng

Development of Assistive Device by Elderly Engineers Association .................................... 260
  Makoto Takashima, Masatomo Shibata, Takakazu Ishimatsu, Murray Lawn, Shigeru Segawa, and Michiyo Yokoo

Study on Action Recognition Based on Kinect and Its Application in Rehabilitation Training .............................................................................. 265
  Nianfeng Li, Yinfei Dai, Rongquan Wang, and Yanhui Shao

A Survey of Fall Detection Algorithm for Elderly Health Monitoring .................................. 270
  Liyang Zhu, Pei Zhou, Anle Pan, Jian Guo, Wei Sun, Lirong Wang, Xiaohe Chen, and Zhen Liu
IBDC 2015: The 2015 International Workshop on Big Data in Crowdsensing

Efficient Privacy-Preserving Aggregation for Mobile Crowdsensing ..................................................275
    Mengdi Huai, Liusheng Huang, Yu-e Sun, and Wei Yang

LSVS: Bringing Layer Slicing and Virtual Sinks to Geographic Opportunistic Routing in Strip WSNs ...........................................................................................................................281
    Chen Liu, Dingyi Fang, Xiaojiang Chen, Yue Hu, Wen Cui, Guangquan Xu, and Hao Chen

Incentive Mechanism Design for Smartphone Crowdsensing ...............................................................287
    Yuan Zhang, Yixin Fang, and Sheng Zhong

Remote Cloud or Local Crowd: Communicating and Sharing the Crowdsensing Data ................................293
    Chao Song, Ming Liu, and Xili Dai

Searching a Circular Corridor with Three Flashlights ........................................................................298
    Jiandong Liu, Bo Jiang, and Lijuan Wang

Some Transformation Methods on Probabilistic Model for Crowdsensing Networks ..................................304
    Shuang Wu, Xiaofeng Gao, and Guihai Chen

ETCS 2015: The 2015 International Workshop on Emerging Topics in Computer Science

An Improved Algorithm of Materialized View Selection within the Confinement of Space .....................310
    Dengfeng Yao, Abudoukelimu Abulizi, and Renkui Hou

Building XML Data Warehouse with Data Reconstruction by Knowledge Graph ........................................314
    Yuyi Jiang, Zhiqing Shao, Yi Guo, Huanhuan Zhang, and Liping Sun

Approximate Normal Parameter Reduction of Fuzzy Soft Set Based on Harmony Search Algorithm ..........321
    Zhi Kong, Lifu Wang, and Wenhua Jia

Study of Photovoltaic Power Generation Output Predicting Model Based on Nonlinear Time Series ...........325
    Li Chunlai, Yang Libin, Teng Yun, and Yuan Shun

A Comprehensive College Coaches Evaluation Model Based on AHP and Grey Correlation Theory ............330
    Zhang Minghui, Lan Yan, and Chen Jifeng

Motion Control on the Working Device of a Demolition Robot Based on an Exponential Reaching Law ..........335
    Ye Ye, Yuwan Cen, and Nenggang Xie

Core Point Evolution: A Waterwave Model of Software Development Process .......................................338
    Zhijing Yu, Kun Ma, and Bo Yang
Studies on Centroid Type-Reduction Algorithms for Interval Type-2 Fuzzy Logic Systems ..........................................................................................................................................................344

Yang Chen and Dazhi Wang

Author Index ..................................................................................................................................................................................350