



BDIOT 2017

**International Conference on Big Data
and Internet of Things**

London, UK

December 20-22, 2017



The Association for Computing Machinery
2 Penn Plaza, Suite 701
New York New York 10121-0701

ACM COPYRIGHT NOTICE. Copyright © 2017 by the Association for Computing Machinery, Inc. Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from Publications Dept., ACM, Inc., fax +1 (212) 869-0481, or permissions@acm.org.

For other copying of articles that carry a code at the bottom of the first or last page, copying is permitted provided that the per-copy fee indicated in the code is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, +1-978-750-8400, +1-978-750-4470 (fax).

ACM ISBN: 978-1-4503-5430-1

Table of Contents

Proceedings of International Conference on Big Data and Internet of Things (BDIOT2017)

Preface.....	vii
Conference Committees.....	viii

- ***Session 1-Big data Analysis and Data Processing***

A Minimal Attribute Set-oriented Data Provenance Method.....	1
<i>Dai Chaofan, Zhang Ran, Li Pei, Wang Wenqian and Cao Zewen</i>	
A Data-based Method for Industrial Big Data Project Prioritization	6
<i>Felix Kuschicke, Thomas Thiele, Tobias Meisen, Sabina Jeschke</i>	
Big Data Educational Portal for Small and Medium Sized Enterprises (SMEs).....	11
<i>Chekfoung Tan and Mohamed Haji</i>	
A Novel Metric for Edge Centrality.....	16
<i>Xiaodi Huang, Muxiong Huang, Weidong Huang</i>	
Efficient Heart Disease Prediction System Using K-Nearest Neighbor Classification Technique.....	21
<i>Nida Khateeb, Muhammad Usman</i>	
Metadata Service for Random Frame Reading of Video Stored in Distributed File System	27
<i>Yang Xu, Le Gao, Yin Li, Xiaobing Huang, Dong Li</i>	
Social Media Sentiment Analysis of Consumer Purchasing Behavior vs Consumer Confidence Index	32
<i>Shahid Shayaa, Mohammed Ali Al-Garadi, Arsalan Piprani, Muhammad Ashraf and Sulaiman Ainin</i>	
An Outlier Detection Technique Based on Spectral Clustering	36
<i>Qiu Yuanyuan, Mao Ting, Chen Yuting and Yu Bo</i>	
Research on Real Time Processing and Intelligent Analysis Technology of Power Big Data	43
<i>Jiarui Xue, Xiangzhou Chen, Huixia Ding and Xiao He</i>	
Advanced Multitenant Hadoop in Smart Open Data Platform	48
<i>Minh Chau Nguyen and Hee-Sun Won</i>	
Handling Large-Scale Data using Two-Tier Hierarchical Super-Peer P2P Network	52
<i>Rasha Kashef and Akshat Niranjana</i>	

Big Data Mining Algorithms for FOG Computing	57
<i>Simon Fong</i>	
A Survey on Hadoop MapReduce Energy Efficient techniques for Intensive Workload.....	62
<i>Manal Alalawi, Herbert Daly</i>	
• Session 2- Signal Processing and Intelligent Computing	
Sentiment Analysis of Online Crowd Input towards Brand Provocation in Facebook, Twitter, and Instagram	67
<i>Nur Sakinah Diyanah Abdullah and Izzal Asnira Zolkepli</i>	
Performance Analytics for Scientific Distributed Computing Environments	75
<i>Olga Datskova, Costin Grigoras and Weidong Shi</i>	
E-commerce Time Series Forecasting using LSTM Neural Network and Support Vector Regression	80
<i>Ghassen Chniti, Houda Bakir, Hédi Zaher</i>	
How people talk about health? Detecting Health Topics from Twitter Streams.....	85
<i>Carmela Comito, Clara Pizzuti, Nicola Procopio</i>	
Laplacian Black Box Variational Inference	91
<i>Xiaopeng Xu, Chuancai Liu, Xiaochun Zhang</i>	
Generating Neural Networks with Optimal Features through Particle Swarm Optimization	96
<i>Ricardo Brito, Simon Fong, Yan Zhuang, Yaoyang Wu</i>	
Multi-scale Anomaly Detection with Wavelets.....	102
<i>Jack Coughlin and Gian Perrone</i>	
Detecting and Adapting to Concept Drift in Continually Evolving Stochastic Processes	109
<i>Sunanda Gamage, Upeka Premaratne</i>	
Towards a Formal Modeling of Cloud Services during the Life-cycle of Service Level Agreement.....	115
<i>Oussama Kamel, Allaoua Chaoui, Mohamed Gharzouli</i>	
Diversity and Serendipity in Recommender Systems.....	120
<i>Keneilwe Zuva, Tranos Zuva</i>	
• Session 3- Information Security and Privacy Protection	
Advanced Phishing Filter Using Autoencoder and Denoising Autoencoder	125
<i>Samira Douzi, Meryem Amar, Bouabid El Ouahidi</i>	

Research on Medical Information Privacy and Security Legal Issues in China-Take Electronic Medical Record as an Example	130
<i>DU Zhen-Yuan</i>	
General Precautions against Security Threats for Computer Networks in SMEs: From the Perspective of Big Data and IOT.....	134
<i>Yaoyang Wu, Simon Fong, Yan Zhuang</i>	
Facial Feature Based Secure Information Transmission	141
<i>Chen Li, Yanjie Wang, Simon Fong, Chenhui Duan, Wei Song</i>	
Human Body and Face Detection based Anti-shoulder Attack System on ATM.....	145
<i>Chen Li, Mengti Liang, Ke Xiao, Simon Fong, Qianli Wang, Wei Song</i>	
A DCT-based Information Hiding Method for Network Authentication	149
<i>Wei Song, Shuanghui Zou, Yifei Tian, Chen Li, Su Sun, Simon Fong</i>	
• Session 4- Wireless Communication and Internet of Things Applications	
IoT Based Smart Charger: An ESP8266 Based Automatic Charger.....	153
<i>Meenakshi Sundaram Karuppaswamy, Navjeet Kumar, Anusuya</i>	
Auto-scaling Applications in Edge Computing: Taxonomy and Challenges	158
<i>Salman Taherizadeh and Vlado Stankovski</i>	
Models for Innovative IoT Ecosystems.....	164
<i>Galia Novakova Nedeltcheva, Elena Shoikova</i>	
A Layered Features Analysis in Smart Farm Environments.....	169
<i>Junyong Park, Jang-Ho Choi, Yong-Ju Lee, Okgee Min</i>	
Towards Real-time Smart Road Construction: Efficient Process Management through the Implementation of Internet of Things	174
<i>Muddsair Sharif, Siegfried Mercelis, Win Van Den Bergh, Peter Hellinckx</i>	
E2ABC: Energy Efficient Approaches for Extending Battery Life of Constrained Devices.....	181
<i>Chethan K Puttanna, Bharat Kumar Prathipati, Gudi Venkata Ramana</i>	
The IoT-based Transition Strategy towards 5G	186
<i>Muhammad Suryanegara, Ajib Setyo Arifin and Muhamad Asvial</i>	
IoT-Based Maritime Application: An Experiment of Ship Radius Detection	191
<i>Ajib Setyo Arifin, Muhammad Suryanegara, Teguh Samudra Firdaus and Muhamad Asvial</i>	

A Novel Semi-Automatic Vulnerability Detection System for Smart Home	195
<i>Xiaoyan Jia, Xiaoyong Li, Yali Gao</i>	
Uncertainty Modeling in Wireless Sensor Networks	200
<i>Gulustan Dogan, Ted Brown</i>	
An Implementation of VR Chemistry Experiment System	205
<i>Jinkun Han, Yifei Tian, Wei Song, Simon Fong</i>	
Modelling Network Traffic Using Time Series Analysis - A Review	209
<i>Mbulelo Ntlangu and Alireza Baghai-Wadji</i>	
• <i>Session 5- Electronic System Design and Application</i>	
Smart Hand Device Gesture Recognition with Dynamic Time Warping Method	216
<i>Lee, Boon Giin; Tran, Viet Cuong; Chong, Teak Wei</i>	
Multimedia Information Publishing Platform based on Server Cluster and Internet of Screens.....	220
<i>Li Zhu, Guoguang Ma, Nan Zhao</i>	
Coupling Design Thinking, User Experience Design and Agile: Towards Cooperation Framework	225
<i>Galia Novakova Nedeltcheva, Elena Shoikova</i>	
A Scientometric Analysis of Aerogel Research in 1996-2015: Visualizing the Knowledge Domain and Emerging Trends	230
<i>Chageng Nie, Lan Sun</i>	
Mobile Application: Patients' Adherence to Medicine In-take Schedules	237
<i>Nichapat Boonnuddar and Pongpisit Wuttidittachotti</i>	

Preface

This volume contains papers presented at the International Conference on Big Data and Internet of Things, which was held in London, UK, from 20th to 22nd December, 2017.

BDIOT provides a scientific platform for both local and international scientists, engineers and technologists who work in all aspects of big data and internet of things. In addition to the contributed papers, internationally known experts from several countries are also invited to deliver keynote speeches at BDIOT 2017.

The volume includes 46 selected papers which were submitted to the conference from universities, research institutes and industries. Each contributed paper has been peer-reviewed by reviewers who were collected organizing and technical committee members as well as other experts in the field from different countries. The proceedings tend to present to the readers the newest researches results and findings in the field of big data and internet of things.

Much of the credit of the success of the conference is due to topic coordinators who have devoted their expertise and experience in promoting and in general co-ordination of the activities for the organization and operation of the conference. The coordinators of various session topics have devoted a considerable time and energy in soliciting papers from relevant researchers for presentation at the conference.

The chairpersons of the different sessions played important role in conducting the proceedings of the session in a timely and efficient manner and on behalf of the conference committee, we express sincere appreciation for their involvement. The reviewers of the manuscripts, those by tradition would remain anonymous, have also been very helpful in efficiently reviewing the manuscripts, providing valuable comments well within the time allotted to them. We express our sincere and grateful thanks to all reviewers.

BDIOT 2017 Organizing Committee

December 20-22, 2017

Conference Committees

Honorary Distinguished Conference Chair

Luiz Moutinho, Dublin City University, Ireland

Conference Committee Chair

Hui Yu, University of Portsmouth, UK

Victor Chang, Xi'an Jiaotong-Liverpool University, China

Organizing Chairs

Simon Fong, University of Macau, China (Macau)

Sabah Mohammed, Lakehead University, Canada

Kelvin Wong, University of Western Sydney, Australia

International Advisory and Technical Committee

Sohail Asghar, COMSATS Institute of Information Technology, Pakistan

Iztok Fister Jr., University of Maribor, Slovenia

Richard Khory, Lakehead University, Canada

Rita Li, Hong Kong Shue Yan University, China (Hong Kong)

Han-Teng Liao, University of Oxford, United Kingdom

Kevin Yuen, Singapore University of Social Sciences, Singapore

Richard Millham, Durban University of Technology, South Africa

Guangmin Sun, Beijing University of Technology, China

Yunsick Sung, Keimyung University, South Korea

Muhammad Usman, Auckland University of Technology, New Zealand

Junbo Wang, University of Aizu, Japan

Song Wei, North China University of Technology, China

Kelvin Wong, University of Western Sydney, Australia

Bee Wah Yap, Universiti Teknologi MARA, Malaysia

Jinan Fiaidhi, Lakehead University, Canada

Seonphil Sunny Jeong, United International College, China

Sabah Mohammed, Lakehead University, Canada

Antonio Tallón, Universidad de Sevilla, Spain

Sung-Bae Cho, Yonsei University, South Korea

Tuul Triyason, KMUTT, Thailand

Mladen Sokele, University of Applied Sciences, Zagreb, Croatia

Carlos Lucas de Freitas, University of Lisbon, Portugal

Pedro Godinho, University of Coimbra, Portugal
Ray Burke, Indiana University, USA
Derek Abbott, The University of Adelaide, Australia
Mathias Baumert, The University of Adelaide, Australia
Ming-Fa Hsieh, National Tsing Hua University, Taiwan
Cho, Kyungeun, Dongguk University, Republic of Korea
Binh P. Nguyen, Institute for High Performance Computing, A*STAR, Singapore
Tobias Meisen, RWTH Aachen University, Germany
Izzal Asnira Zolkepli, Universiti Sains Malaysia, Malaysia
Ayush Singhal, National Institutes of Health, USA
Arockiam Arockiam.L, Jayaraj Annapackiam College for Women (Autonomous), India
Sukhchandan Randhawa, Thapar University, India
Jiting Xu, eBay, Austin, TX, USA
Mohammad Alomari, Applied Science Private University, Jordan
Saud Altaf, PMAS-Arid Agriculture University Rawalpindi, Pakistan
Faycal Bensaali, Qatar University, Qatar
Cui Jiali, North China University of Technology, China
Alireza Baghai-Wadji, University of Cape Town, South Africa
Rasha Kashef, IVEY Business School, Canada
Oussama Kamel, University Constantine 2 Abdelhamid Mehri Constantine, Algeria
Muhammad Suryanegara, Universitas Indonesia, Indonesia
Htoo Htoo, Saitama University, Japan
KOLLA BHANU PRAKASH, CHIRALA ENGINEERING COLLEGE, India
Keneilwe Zuva, University of Botswana, Botswana
Gulustan Dogan, Yildiz Technical University Istanbul, TURKEY
Houda BAKIR, Datavora, Tunisia
Adam Wong, The Hong Kong Polytechnic University, Hong Kong
Xiaodi Huang, Charles Sturt University, Australia
Boon Giin Lee, Keimyung University, South Korea
Li Zhu, Hubei University of technology, China
Chen Li, North China University of Technology, China
Galia Novakova Nedeltcheva, Sofia University, Bulgaria
Sulaiman Ainin, University of Malaya, Malaysia
Pongpisit Wuttidittachotti, King Mongkut's University of Technology North Bangkok, Thailand

Publication Chair

Zeng Hao, Chongqing University, China

Proceedings Chair

Tingxi Wen, Xiamen University, China

Technical Sponsors

Data Analytics and Collaborative Computing Laboratory, University of Macau



North China University of Technology, Beijing, China

