Communications
in Computer and Information Science

Commenced Publication in 2007
Founding and Former Series Editors:
Alfredo Cuzzocrea, Xiaoyong Du, Orhun Kara, Ting Liu, Dominik Ślęzak, and Xiaokang Yang

Editorial Board

Simone Diniz Junqueira Barbosa
Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Rio de Janeiro, Brazil

Phoebe Chen
La Trobe University, Melbourne, Australia

Joaquim Filipe
Polytechnic Institute of Setúbal, Setúbal, Portugal

Igor Kotenko
St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences, St. Petersburg, Russia

Krishna M. Sivalingam
Indian Institute of Technology Madras, Chennai, India

Takashi Washio
Osaka University, Osaka, Japan

Junsong Yuan
Nanyang Technological University, Singapore

Lizhu Zhou
Tsinghua University, Beijing, China
More information about this series at http://www.springer.com/series/7899
Beiji Zou · Min Li
Hongzhi Wang · Xianhua Song
Wei Xie · Zeguang Lu (Eds.)

Data Science

Third International Conference
of Pioneering Computer Scientists,
Engineers and Educators, ICPCSEE 2017
Changsha, China, September 22–24, 2017
Proceedings, Part I

Springer
Preface

As the general and program co-chairs of the Third International Conference of Pioneer Computer Scientists, Engineers, and Educators 2017 (ICPCSEE 2017, originally ICYCSEE), it is our great pleasure to welcome you to the conference, which was held in Changsha, China, 22–24 September 2017, hosted by Central South University and the Computer Education Committee of the Hunan Higher Education Federation. The goal of this conference is to provide a forum for computer scientists, engineers, and educators.

The call for papers of this year’s conference attracted 420 paper submissions. After the hard work of the Program Committee, 112 papers were accepted to appear in the conference proceedings, with an acceptance rate of 26.7%. The main topic of this conference is data science. The accepted papers cover a wide range of areas related to basic theory and techniques for data science including mathematical issues in data science, computational theory for data science, big data management and applications, data quality and data preparation, evaluation and measurement in data science, data visualization, big data mining and knowledge management, infrastructure for data science, machine learning for data science, data security and privacy, applications of data science, case study of data science, multimedia data management and analysis, data-driven scientific research, data-driven bioinformatics, data-driven healthcare, data-driven management, data-driven eGovernment, data-driven smart city/planet, data marketing and economics, social media and recommendation systems, data-driven security, data-driven business model innovation, and social and/or organizational impacts of data science.

We would like to thank all the Program Committee members, 216 coming from 147 institutes, for their hard work in completing the review tasks. Their collective efforts made it possible to attain quality reviews for all the submissions within a few weeks. Their diverse expertise in each individual research area helped us to create an exciting program for the conference. Their comments and advice helped the authors to improve the quality of their papers and gain deeper insights.

Great thanks should also go to the authors and participants for their tremendous support in making the conference a success. We thank Lanlan Chang and Jian Li from Springer, whose professional assistance was invaluable in the production of the proceedings.

Besides the technical program, this year the ICPCSEE offered different experiences to the participants. We welcome you to the Central South China to enjoy the beautiful summer in Changsha. We hope you enjoy the conference proceedings.

July 2017

Min Li
Fangxiang Wu
Qilong Han
Ronghua Shi
The Third International Conference of Pioneering Computer Scientists, Engineers, and Educators (ICPCSEE 2017, originally ICYCSEE) –[http://2017.icpcsee.org]– was held in Changsha, China, September 22–24, 2017, and hosted by Central South University and the Computer Education Committee of the Hunan Higher Education Federation.

ICPCSEE 2017 Steering Committee

Yaoxue Zhang Central South University, China
Jianer Chen Central South University, China
Yi Pan Central South University, China
Jianxin Wang Central South University, China

General Chair

Beiji Zou Central South University, China

Program Chairs

Min Li Central South University, China
Fangxiang Wu Central South University, China
Qilong Han Harbin Engineering University, China
Ronghua Shi Central South University, China

Organization Chairs

Kehua Guo Central South University, China
Xiaoning Peng Huaihua University, China
Junfeng Man Hunan University of Technology, China
Zeguang Lu Sciences of Country Tripod Institute of Data Science, China

Publication Chairs

Hongzhi Wang Harbin Institute of Technology, China
Guanglu Sun Harbin University of Science and Technology, China
Weipeng Jing Northeast Forestry University, China

Publication Co-chairs

Xianhua Song Harbin University of Science and Technology, China
Wei Xie Harbin University of Science and Technology, China
Yong Wang
Central South University, China
Liangwu Shi
Hunan University of Commerce, China

**Education Chairs**

Jiawei Huang
Central South University, China
Minsheng Tan
University of South China, China

**Industry Chair**

Yue Shen
Hunan Agricultural University, China

**Demo Chairs**

Jiazhi Xia
Central South University, China
Ying Xu
Hunan University, China

**Panel Chairs**

Jiawei Luo
Hunan University, China
Shaoliang Peng
National University of Defense Technology, China

**Registration/Financial Chairs**

Ya Huang
Central South University, China
Chengzhang Zhu
Central South University, China

**Post/Expo Chair**

Renren Liu
Xiangtan University, China

**ICYCSEE Steering Committee**

Jiajun Bu
Zhejiang University, China
Jian Chen
PARATERA, China
Xuebin Chen
North China University of Science and Technology, China
Wanxiang Che
Harbin Institute of Technology, China
Tian Feng
Institute of Software, Chinese Academy of Sciences, China
Qilong Han
Harbin Engineering University, China
Yiliang Han
Engineering University of CAPF, China
Yinhe Han
Institute of Computing Technology, Chinese Academy of Sciences, China
Weipeng Jing
Northeast Forestry University, China
Hai Jin
Huazhong University of Science and Technology, China
Wei Li
Central Queensland University, Australia
Yingao Li Neuedu, China
Junyu Lin Institute of Information Engineering,
Chinese Academy of Sciences, China
Zeguang Lu Sciences of Country Tripod Institute of Data Science, China
Haiwei Pan Harbin Engineering University, China
Shaoiang Peng National University of Defense Technology, China
Haoliang Qi Heilongjiang Institute of Technology, China
Pinle Qin North University of China, China
Zhaowen Qiu Northeast Forestry University, China
Yanjuan Sang Beijing Gooagoo Technology Service Co., Ltd., China
Zheng Shan The PLA Information Engineering University, China
Guanglu Sun Harbin University of Science and Technology, China
Hongzhi Wang Harbin Institute of Technology, China
Tao Wang Peking University, China
Xiaohui Wei Jilin University, China
Lifang Wen Beijing Huazhang Graphics & Information Co., Ltd., China
Yu Yao Northeastern University, China
Xiaoru Yuan Peking University, China
Yingtao Zhang Harbin Institute of Technology, China
Yunquan Zhang Institute of Computing Technology,
Chinese Academy of Sciences, China
Liehuang Zhu Beijing Institute of Technology, China
Min Zhu Sichuan University, China

Program Committee Members

Chunyu Ai University of South Carolina Upstate, USA
Jiyao An Hunan University, China
Ran Bi Dalian University of Technology, China
Zhipeng Cai Georgia State University, USA
Yi Cai South China University of Technology, China
Zhao Cao Beijing Institute of Technology, China
Richard Chbeir LIUPPA Laboratory, France
Wanxiang Che Harbin Institute of Technology, China
Wenliang Chen Soochow University, China
Chunyi Chen Changchun University of Science and Technology, China
Wei Chen Beijing Jiaotong University, China
Zhumin Chen Shandong University, China
Hao Chen Hunan University, China
Shu Chen Xiangtan University, China
Bolin Chen Northwestern Polytechnical University, China
Hao Chen Hunan University, China
Xuebin Chen North China University of Science and Technology, China
Siyao Cheng Harbin Institute of Technology, China
Byron Choi Hong Kong Baptist University, Hong Kong, China
Xinyu Dai Nanjing University, China
<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lei Deng</td>
<td>Central South University, China</td>
</tr>
<tr>
<td>Vincenzo Deufemia</td>
<td>University of Salerno, Italy</td>
</tr>
<tr>
<td>Xiaofeng Ding</td>
<td>Huazhong University, China</td>
</tr>
<tr>
<td>Jianrui Ding</td>
<td>Harbin Institute of Technology, China</td>
</tr>
<tr>
<td>Qun Ding</td>
<td>Heilongjiang University, China</td>
</tr>
<tr>
<td>Xiaoju Dong</td>
<td>Shanghai Jiao Tong University, China</td>
</tr>
<tr>
<td>Hongbin Dong</td>
<td>Harbin Engineering University, China</td>
</tr>
<tr>
<td>Zhicheng Dou</td>
<td>Renmin University of China, China</td>
</tr>
<tr>
<td>Jianyong Duan</td>
<td>North China University of Technology, China</td>
</tr>
<tr>
<td>Xiping Duan</td>
<td>Harbin Normal University, China</td>
</tr>
<tr>
<td>Lei Duan</td>
<td>Sichuan University, China</td>
</tr>
<tr>
<td>Junbin Fang</td>
<td>Jinan University, China</td>
</tr>
<tr>
<td>Xiaolin Fang</td>
<td>Southeast University, China</td>
</tr>
<tr>
<td>Guangsheng Feng</td>
<td>Harbin Engineering University, China</td>
</tr>
<tr>
<td>Jianlin Feng</td>
<td>Sun Yat-Sen University, China</td>
</tr>
<tr>
<td>Weisen Feng</td>
<td>Sichuan University, China</td>
</tr>
<tr>
<td>Guohong Fu</td>
<td>Heilongjiang University, China</td>
</tr>
<tr>
<td>Jing Gao</td>
<td>Dalian University of Technology, China</td>
</tr>
<tr>
<td>Dianxuan Gong</td>
<td>North China University of Science and Technology, China</td>
</tr>
<tr>
<td>Yu Gu</td>
<td>Northeastern University, China</td>
</tr>
<tr>
<td>Yuhang Guo</td>
<td>Beijing Institute of Technology, China</td>
</tr>
<tr>
<td>Jiafeng Guo</td>
<td>Institute of Computing Technology, Chinese Academy of Sciences, China</td>
</tr>
<tr>
<td>Meng Han</td>
<td>Georgia State University, USA</td>
</tr>
<tr>
<td>Qi Han</td>
<td>Harbin Institute of Technology, China</td>
</tr>
<tr>
<td>Xianpei Han</td>
<td>Chinese Academy of Sciences, China</td>
</tr>
<tr>
<td>Zhongyuan Han</td>
<td>Harbin Institute of Technology, China</td>
</tr>
<tr>
<td>Tianyong Hao</td>
<td>Guangdong University of Foreign Studies, China</td>
</tr>
<tr>
<td>Shizhu He</td>
<td>Chinese Academy of Sciences, China</td>
</tr>
<tr>
<td>Jia He</td>
<td>Chengdu University of Information Technology, China</td>
</tr>
<tr>
<td>Qinglai He</td>
<td>Arizona State University, USA</td>
</tr>
<tr>
<td>Liang Hong</td>
<td>Wuhan University, China</td>
</tr>
<tr>
<td>Zhang Hu</td>
<td>Shanxi University, China</td>
</tr>
<tr>
<td>Chengquan Hu</td>
<td>Jilin University, China</td>
</tr>
<tr>
<td>Wei Hu</td>
<td>Nanjing University, China</td>
</tr>
<tr>
<td>Hao Huang</td>
<td>Wuhan University, China</td>
</tr>
<tr>
<td>Lan Huang</td>
<td>Jilin University, China</td>
</tr>
<tr>
<td>Shujian Huang</td>
<td>Nanjing University, China</td>
</tr>
<tr>
<td>Ruoyu Jia</td>
<td>Sichuan University, China</td>
</tr>
<tr>
<td>Bin Jiang</td>
<td>Hunan University, China</td>
</tr>
<tr>
<td>Jiming Jiang</td>
<td>King Abdullah University of Science &amp; Technology, Kingdom of Saudi Arabia</td>
</tr>
<tr>
<td>Wenjun Jiang</td>
<td>Hunan University, China</td>
</tr>
<tr>
<td>Feng Jiang</td>
<td>Harbin Institute of Technology, China</td>
</tr>
<tr>
<td>Weipeng Jing</td>
<td>Northeast Forestry University, China</td>
</tr>
<tr>
<td>Shenggen Ju</td>
<td>Sichuan University, China</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Jun Meng</td>
<td>Dalian University of Technology, China</td>
</tr>
<tr>
<td>Tiezheng Nie</td>
<td>Northeastern University, China</td>
</tr>
<tr>
<td>Haiwei Pan</td>
<td>Harbin Engineering University, China</td>
</tr>
<tr>
<td>Jialiarg Peng</td>
<td>Norwegian University of Science and Technology, Norway</td>
</tr>
<tr>
<td>Wei Peng</td>
<td>Kunming University of Science and Technology, China</td>
</tr>
<tr>
<td>Xiaqoqing Peng</td>
<td>Central South University, China</td>
</tr>
<tr>
<td>Fei Peng</td>
<td>Hunan University, China</td>
</tr>
<tr>
<td>Yuwei Peng</td>
<td>Wuhan University, China</td>
</tr>
<tr>
<td>Jianzhong Qi</td>
<td>University of Melbourne, Australia</td>
</tr>
<tr>
<td>Shaojie Qiao</td>
<td>Southwest Jiaotong University, China</td>
</tr>
<tr>
<td>Zhe Quan</td>
<td>Hunan University, China</td>
</tr>
<tr>
<td>Xingxia Shao</td>
<td>Peking University, China</td>
</tr>
<tr>
<td>Qiaomu Shen</td>
<td>The Hong Kong University of Science and Technology, Hong Kong, China</td>
</tr>
<tr>
<td>Hongwei Shi</td>
<td>Sichuan University, China</td>
</tr>
<tr>
<td>Hongtao Song</td>
<td>Harbin Engineering University, China</td>
</tr>
<tr>
<td>Wei Song</td>
<td>North China University of Technology, China</td>
</tr>
<tr>
<td>Xianhua Song</td>
<td>Harbin Institute of Technology, China</td>
</tr>
<tr>
<td>Yanan Sun</td>
<td>Sichuan University, China</td>
</tr>
<tr>
<td>Chengjie Sun</td>
<td>Harbin Institute of Technology, China</td>
</tr>
<tr>
<td>Guanglu Sun</td>
<td>Harbin University of Science and Technology, China</td>
</tr>
<tr>
<td>Minghui Sun</td>
<td>Jilin University, China</td>
</tr>
<tr>
<td>Xiao Sun</td>
<td>Hefei University of Technology, China</td>
</tr>
<tr>
<td>Guanghua Tan</td>
<td>Hunan University, China</td>
</tr>
<tr>
<td>Wenrong Tan</td>
<td>Southwest University for Nationalities, China</td>
</tr>
<tr>
<td>Jintao Tang</td>
<td>National University of Defense Technology, China</td>
</tr>
<tr>
<td>Dang Tang</td>
<td>Chengdu University of Information Technology, China</td>
</tr>
<tr>
<td>Binbin Tang</td>
<td>Works Applications, Japan</td>
</tr>
<tr>
<td>Xifeng Tong</td>
<td>Northeast Petroleum University, China</td>
</tr>
<tr>
<td>Yongxin Tong</td>
<td>Beihang University, China</td>
</tr>
<tr>
<td>Vicenc Torra</td>
<td>Högskolan i Skövde, Sweden</td>
</tr>
<tr>
<td>Leong Hou U</td>
<td>University of Macau, China</td>
</tr>
<tr>
<td>Chaokun Wang</td>
<td>Tsinghua University, China</td>
</tr>
<tr>
<td>Chunnan Wang</td>
<td>Harbin Institute of Technology, China</td>
</tr>
<tr>
<td>Dong Wang</td>
<td>Hunan University, China</td>
</tr>
<tr>
<td>Hongzhi Wang</td>
<td>Harbin Institute of Technology, China</td>
</tr>
<tr>
<td>Jinbao Wang</td>
<td>Harbin Institute of Technology, China</td>
</tr>
<tr>
<td>Xin Wang</td>
<td>Tianjin University, China</td>
</tr>
<tr>
<td>Yunfeng Wang</td>
<td>Sichuan University, China</td>
</tr>
<tr>
<td>Yingjie Wang</td>
<td>Yantai University, China</td>
</tr>
<tr>
<td>Yongheng Wang</td>
<td>Hunan University, China</td>
</tr>
<tr>
<td>Zhiphiang Wang</td>
<td>HeiLongJiang University, China</td>
</tr>
<tr>
<td>Zhewei Wei</td>
<td>Renming University, China</td>
</tr>
<tr>
<td>Zhongyu Wei</td>
<td>Fudan University, China</td>
</tr>
<tr>
<td>Yan Wu</td>
<td>Changchun University, China</td>
</tr>
<tr>
<td>Zhihong Wu</td>
<td>Sichuan University, China</td>
</tr>
</tbody>
</table>
Huayu Wu Institute for Infocomm Research, China
Rui Xia Nanjing University of Science and Technology, China
Min Xian Utah State University, USA
Tong Xiao Northeastern University, China
Yi Xiao Hunan University, China
Degui Xiao Hunan University, China
Sheng Xiao Hunan University, China
Minzhu Xie Hunan Normal University, China
Jing Xu Changchun University of Science and Technology, China
Jianqiu Xu Nanjing University of Aeronautics and Astronautics, China
Dan Xu University of Trento, Italy
Ying Xu Hunan University, China
Yaohong Xue Changchun University of Science and Technology, China
Mingyuan Yan University of North Georgia, USA
Bian Yang Norwegian University of Science and Technology, Norway
Yajun Yang Tianjin University, China
Gaobo Yang Hunan University, China
Lei Yang HeiLongJiang University, China
Ning Yang Sichuan University, China
Bin Yao Shanghai Jiao Tong University, China
Yuxin Ye Jilin University, China
Minghao Yin Northeast Normal University, China
Dan Yin Harbin Engineering University, China
Zhou Yong China University of Mining and Technology, China
Jingguo You Kunming University of Science and Technology, China
Lei Yu Georgia Institute of Technology, USA
Dong Yu Beijing Language and Culture University, China
Ye Yuan Northeastern University, China
Kun Yue Yunnan University, China
Lichen Zhang Shaanxi Normal University, China
Yongqing Zhang Chengdu University of Information Technology, China
Meishan Zhang Singapore University of Technology and Design, Singapore
Xiao Zhang Renmin University of China, China
Huijie Zhang Northeast Normal University, China
Kejia Zhang Harbin Engineering University, China
Yonggang Zhang Jilin University, China
Jiajun Zhang Institute of Automation, Chinese Academy of Sciences, China
Yu Zhang Harbin Institute of Technology, China
Haixian Zhang Sichuan University, China
Yi Zhang Sichuan University, China
Boyu Zhang Utah State University, USA
Wenjie Zhang The University of New South Wales, Australia
Xiaowang Zhang Tianjin University, China
Tiejun Zhang Harbin University of Science and Technology, China
Dongxiang Zhang University of Electronic Science and Technology of China, China
<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liguo Zhang</td>
<td>Harbin Engineering University, China</td>
</tr>
<tr>
<td>Yingtao Zhang</td>
<td>Harbin Institute of Technology, China</td>
</tr>
<tr>
<td>Jian Zhao</td>
<td>ChangChun University, China</td>
</tr>
<tr>
<td>Xin Zhao</td>
<td>Renmin University of China, China</td>
</tr>
<tr>
<td>Qijun Zhao</td>
<td>Sichuan University, China</td>
</tr>
<tr>
<td>Bihai Zhao</td>
<td>Changsha University, China</td>
</tr>
<tr>
<td>Hai Zhao</td>
<td>Shanghai Jiao Tong University, China</td>
</tr>
<tr>
<td>Wenping Zheng</td>
<td>Shanxi University, China</td>
</tr>
<tr>
<td>Jiancheng Zhong</td>
<td>Hunan Normal University, China</td>
</tr>
<tr>
<td>Changjian Zhou</td>
<td>Northeast Agricultural University, China</td>
</tr>
<tr>
<td>Fucai Zhou</td>
<td>Northeastern University, China</td>
</tr>
<tr>
<td>Jinghua Zhu</td>
<td>Harbin Institute of Technology, China</td>
</tr>
<tr>
<td>Yuanyuan Zhu</td>
<td>Wuhan University, China</td>
</tr>
<tr>
<td>Min Zhu</td>
<td>Sichuan University, China</td>
</tr>
<tr>
<td>Zede Zhu</td>
<td>Hefei Institutes of Physical Science,</td>
</tr>
<tr>
<td></td>
<td>Chinese Academy of Sciences, China</td>
</tr>
<tr>
<td>Quan Zou</td>
<td>Tianjin University, China</td>
</tr>
<tr>
<td>Wangmeng Zuo</td>
<td>Harbin Institute of Technology, China</td>
</tr>
</tbody>
</table>
# Contents – Part I

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Fine-Grained Emotion Analysis Method for Chinese Microblog</td>
<td>1</td>
</tr>
<tr>
<td><em>Rui Zhou, Hu-yin Zhang, and Gang Ye</em></td>
<td></td>
</tr>
<tr>
<td>Research of Detection Algorithm for Time Series Abnormal Subsequence</td>
<td>12</td>
</tr>
<tr>
<td><em>Chunkai Zhang, Haodong Liu, and Ao Yin</em></td>
<td></td>
</tr>
<tr>
<td>An Improved SVM Based Wind Turbine Multi-fault Detection Method</td>
<td>27</td>
</tr>
<tr>
<td><em>Shiyao Qin, Kaixuan Wang, Xiaojing Ma, Wenzhuo Wang, and Mei Li</em></td>
<td></td>
</tr>
<tr>
<td>GPU Based Hash Segmentation Index for Fast T-overlap Query</td>
<td>39</td>
</tr>
<tr>
<td><em>Lianyin Jia, Yongbin Zhang, Mengjuan Li, Jiaman Ding, and Jinguo You</em></td>
<td></td>
</tr>
<tr>
<td>A Collaborative Filtering Recommendation Algorithm Based</td>
<td>52</td>
</tr>
<tr>
<td>on the Difference and the Correlation of Users’ Ratings</td>
<td></td>
</tr>
<tr>
<td><em>Zhao-hui Cai, Jing-song Wang, Yong-kai Li, and Shu-bo Liu</em></td>
<td></td>
</tr>
<tr>
<td>Research on Pattern Matching Method of Multivariate Hydrological</td>
<td>64</td>
</tr>
<tr>
<td>Time Series</td>
<td></td>
</tr>
<tr>
<td><em>Zhen Gai, Yuansheng Lou, Feng Ye, and Ling Li</em></td>
<td></td>
</tr>
<tr>
<td>Further Analysis of Candlestick Patterns’ Predictive Power</td>
<td>73</td>
</tr>
<tr>
<td><em>Tao Lv and Yongtao Hao</em></td>
<td></td>
</tr>
<tr>
<td>Partial Least Squares (PLS) Methods for Abnormal Detection</td>
<td>88</td>
</tr>
<tr>
<td>of Breast Cells</td>
<td></td>
</tr>
<tr>
<td><em>Yuchen Zhu, Shanxiong Chen, Chunrong Chen, and Lin Chen</em></td>
<td></td>
</tr>
<tr>
<td>Desktop Data Driven Approach to Personalize Query Recommendation</td>
<td>100</td>
</tr>
<tr>
<td><em>Xiao-yun Li and Ying Yu</em></td>
<td></td>
</tr>
<tr>
<td>Disease Prediction Based on Transfer Learning in Individual Healthcare</td>
<td>110</td>
</tr>
<tr>
<td><em>Yang Song, Tianbai Yue, Hongzhi Wang, Jianzhong Li, and Hong Gao</em></td>
<td></td>
</tr>
<tr>
<td>Research on Fuzzy Matching Query Algorithm Based on Spatial</td>
<td>123</td>
</tr>
<tr>
<td>Multi-keyword</td>
<td></td>
</tr>
<tr>
<td><em>Suzhi Zhang, Yanan Zhao, and Rui Yang</em></td>
<td></td>
</tr>
<tr>
<td>A New Approach to Dense Spectrum Analysis of Infrasonic Signals</td>
<td>134</td>
</tr>
<tr>
<td><em>Kaiyan Xing, Kaixue Hao, and Mei Li</em></td>
<td></td>
</tr>
</tbody>
</table>
A New Method for Medical Image Retrieval Based on Markov Random Field
  Tiaodi Wang, Haiwei Pan, Xiaolin Xie, Zhiqiang Zhang, and Xiaoning Feng

Three-Dimensional Reconstruction of Wood Carving Cultural Relics Based on CT Tomography Data
  Guiling Zhao, Zongji Deng, Jun Shen, Zhaowen Qiu, and Jing Huang

Text Feature Extraction and Classification Based on Convolutional Neural Network (CNN)
  Taohong Zhang, Cunfang Li, Nuan Cao, Rui Ma, ShaoHua Zhang, and Nan Ma

Predicting Big-Five Personality for Micro-blog Based on Robust Multi-task Learning
  Shuguang Huang, Jinghua Zheng, Di Xue, and Nan Zhao

Automatic Malware Detection Using Deep Learning Based on Static Analysis
  Liu Liu and Baosheng Wang

High-Level Multi-difference Cues for Image Saliency Detection
  Jianwei Sun, Junfeng Wu, Hong Yu, Meiling Zhang, Qiang Luo, and Juanjuan Sun

Nonlinear Dimensionality Reduction via Homeomorphic Tangent Space and Compactness
  Shaoqun Zhang and Wanyun Xie

Selective Image Matting with Scalable Variance and Model Rectification
  Xiao Chen, Fazhi He, Yiteng Pan, and Haojun Ai

Side-Channel Attacks Based on Collaborative Learning
  Biao Liu, Zhao Ding, Yang Pan, Jiali Li, and Huamin Feng

Research on Hydrological Time Series Prediction Based on Combined Model
  Yi Cheng, Yuansheng Lou, Feng Ye, and Ling Li

A Cross-View Model for Tourism Demand Forecasting with Artificial Intelligence Method
  Siming Han, Yanhui Guo, Han Cao, Qian Feng, and Yifei Li

Computational Intensity Prediction Model of Vector Data Overlay with Random Forest Method
  Qian Wang, Han Cao, and Yan-Hui Guo
An Implementation and Improvement of Convolutional Neural Networks on HSA Platform ................................................................. 594
Zhenshan Bao, Qi Luo, and Wenbo Zhang

An Enhanced Transportation Mode Detection Method Based on GPS Data ............................................................. 605
Jing Liang, Qiuhui Zhu, Min Zhu, Mingzhao Li, Xiaowei Li, Jianhua Wang, Silan You, and Yilan Zhang

The Triangle Collapse Algorithm Based on Angle Error Metrics ............... 621
Xiaorong Yan, Yuansheng Lou, and Ling Li

Spatial-Temporal Event Detection Method with Multivariate Water Quality Data .............................................................. 633
Yingchi Mao, Zhitao Li, Xiaoli Chen, and Longbao Wang

Context-Aware Technology of Disabled Health Service for Intelligent Community .................................................... 646
Yao Tan and Wenbi Rao

DFDVis: A Visual Analytics System for Understanding the Semantics of Data Flow Diagram ............................................. 660
Hao Xiong, Haocheng Zhang, Xiaoju Dong, Lingxi Meng, and Wenyang Zhao

Design and Implementation of Medical Data Management System .......... 674
Jie Wang, Jianqiao Liu, Jian Li, Jian Zhang, and Qi Lei

Recognition of Natural Road Sign Based on the Improved Curvature Feature ........................................................ 689
Yanqing Wang, Hao Zheng, and Weiwei Chen

Evaluating Cities’ Independent Innovation Capabilities Based on Patent Using Data Analysis Methods ......................... 696
Yan Zhang, Ping Yuan, and Bin Yu

Research on Target Extraction Technology of Fruit and Vegetable Images in the Complex Environment ....................... 708
Yanqing Wang and Hao Zheng

Route Guidance for Visually Impaired Based on Haptic Technology and Their Spatial Cognition ................................. 718
Guansheng Wang, Jianghua Zheng, and Hong Fan

Prediction of Passenger Flow at Sanya Airport Based on Combined Methods .......................................................... 729
Xia Liu, Xia Huang, Lei Chen, Zhao Qiu, and Ming-rui Chen
XX        Contents – Part I

Research on the Copyright Protection Technology of Digital Clothing Effect Diagram ........................................ 741
    Yongqiang Chen and Lihua Peng

Visualization Analysis Framework for Large-Scale Software Based on Software Network ................................ 751
    Shengbing Ren, Mengyu Jia, Fei Huang, and Yuan Liu

Author Index ................................................................. 765
Contents – Part II

Extracting Chinese Explanatory Expressions with Discrete and Neural CRFs ................................................................. 1
Da Pan, Mengqi Wang, Meishan Zhang, and Guohong Fu

Incremental Influence Maximization for Dynamic Social Networks ........ 13
Yake Wang, Jinhua Zhu, and Qian Ming

Method of Relevance Judgment for App Software’s User Reviews .......... 28
Qixin Xiang, Ying Jiang, Meng Ran, and Jiaman Ding

Topic Model Based Text Similarity Measure for Chinese Judgment Document ........................................................................... 42
Yue Wang, Jidong Ge, Yemao Zhou, Yi Feng, Chuanyi Li, Zhongjin Li, Xiaoyu Zhou, and Bin Luo

Utilizing Crowdsourcing for the Construction of Chinese-Mongolian Speech Corpus with Evaluation Mechanism .......................... 55
Rihai Su, Shumin Shi, Meng Zhao, and Heyan Huang

A Cluster Guided Topic Model for Social Query Expansion .................. 66
Wenyu Zhao and Dong Zhou

A Framework of Mobile Context-Aware Recommender System ........... 78
Caihong Liu and Chonghui Guo

Build Evidence Chain Relational Model Based on Chinese Judgment Documents .................................................................................. 94
Siyuan Kong, Yemao Zhou, Jidong Ge, Zhongjin Li, Chuanyi Li, Yi Feng, Xiaoyu Zhou, and Bin Luo

Research and Development of Virtual Instruments System Based on Depth Camera .......................................................... 108
Xiao-li Xu, Ming-hui Sun, Xin-yue Sun, Wei-yu Zhao, and Xiaoying Sun

Text Understanding with a Hybrid Neural Network Based Learning ........ 115
Shen Gao, Huaping Zhang, and Kai Gao

Towards Realizing Mandarin-Tibetan Bi-lingual Emotional Speech Synthesis with Mandarin Emotional Training Corpus ......................... 126
Peiwen Wu, Hongwu Yang, and Zhenye Gan
Mining Initial Nodes with BSIS Model and BS-G Algorithm on Social Networks for Influence Maximization
Xiaoheng Deng, Dejuan Cao, Yan Pan, Hailan Shen, and Fang Long

Critical Value Aware Data Acquisition Strategy in Wireless Sensor Networks
Ran Bi, Guozhen Tan, and Xiaolin Fang

An Energy Efficient Routing Protocol for In-Vehicle Wireless Sensor Networks
Chundong Wang, Zhentang Zhao, Likun Zhu, and Honglei Yao

Energy-Conserving Transmission Network Model Based on Service-Awareness
Huyin Zhang, Chenghao Li, Tianying Zhou, Long Qian, and Jingcai Zhou

A Multi-objective Optimization Data Scheduling Algorithm for P2P Video Streaming
Pingshan Liu, Xiaoyi Xiong, and Guimin Huang

A Novel Range-Free Jammer Localization Solution in Wireless Network by Using PSO Algorithm
Liang Pang, Xiao Chen, Zhi Xue, and Rida Khatoun

An Algorithm for Hybrid Nodes Barrier Coverage Based on Voronoi in Wireless Sensor Networks
Xiaochao Dang, Rucang Ma, Zhanjun Hao, and Meixiu Ma

Measurement Analysis of an Indoor Positioning System Based on LTE
Jiahui Qiu, Qi Liu, Wenhao Zhang, and Yi Chen

Urban Trace Utilizing Mobile Sequence
Yukun Ma, Bin Xu, and Qi Li

An Extension to ns-3 for Simulating Mobile Charging with Wireless Energy Transfer
Ping Zhong, Yating Li, Weile Huang, Xiaoyan Kui, Yiming Zhang, and Yingwen Chen

Design and Implementation of Distributed Broadcast Algorithm Based on Vehicle Density for VANET Safety-Related Messages
Wei Wu, Zhijuan Li, Yunan Zhang, Jianli Guo, and Jing Zhao

Prediction of Cell Specific O-GalNAc Glycosylation in Human
Yuanqiang Zou, Kenli Li, Taijiao Jiang, and Yousong Peng
Supervised Learning for Gene Regulatory Network Based on Flexible Neural Tree Model .................................................. 293  
   *Bin Yang and Wei Zhang*

Predicting the Antigenic Variant of Human Influenza A(H3N2) Virus with a Stacked Auto-Encoder Model .................................................. 302  
   *Zhiying Tan, Beibei Xu, Kenli Li, Taijiao Jiang, and Yousong Peng*

A Novel Statistical Power Model for Integrated GPU with Optimization ........ 311  
   *Qiong Wang, Ning Li, Li Shen, and Zhiying Wang*

Application of OFDM-CDMA in Multi-user Underwater Acoustic Communication Based on Time Reversal Mirror ................................. 325  
   *Yonggang Wang, Jingwei Yin, Zhongrong Pan, and Pengyu Du*

Hypergraph-Based Data Reduced Scheduling Policy for Data-Intensive Workflow in Clouds ................................................................. 335  
   *Zhigang Hu, Jia Li, Meiguang Zheng, Xinxin Zhang, Hui Kang, Yong Tao, and Jiao Yang*

Software System Rejuvenation Modeling Based on Sequential Inspection Periods and State Multi-control Limits ........................................ 350  
   *Weichao Dang and Jianchao Zeng*

Research on Power Quality Disturbance Signal Classification Based on Random Matrix Theory ......................................................... 365  
   *Keyan Liu, Dongli Jia, Kaiyuan He, Tingting Zhao, and Fengzhan Zhao*

DCC: Distributed Cache Consistency ............................................. 377  
   *Shenling Liu, Chunyuan Zhang, and Yujiao Chen*

Harmonic Pollution Level Assessment in Distribution System Using Extended Cloud Similarity Measurement Method ................................. 388  
   *Tianlei Zang, Yan Wang, Zhengyou He, and Qingquan Qian*

Fusion of Multimodal Color Medical Images Using Quaternion Principal Component Analysis ......................................................... 401  
   *Qamar Nawaz, Xiao Bin, Li Weisheng, and Isma Hamid*

Research on Adaptive Mobile Collaborative Learning System ................ 414  
   *Ling Luo, You Yang, and Yan Wei*

Plagiarism Detection in Homework Based on Image Hashing .................. 424  
   *Ying Chen, Liping Gan, Shiqing Zhang, Wenping Guo, Yuelong Chuang, and Xiaoming Zhao*
A Multi-objective Genetic Algorithm Based on Individual Density Distance

_Lianshuan Shi and Huahui Wang_

An Improved Binary Wolf Pack Algorithm Based on Adaptive Step Length and Improved Update Strategy for 0-1 Knapsack Problems

_Liting Guo and Sanyang Liu_

Reform of Teaching Mode in Universities Based on Big Data

_Bing Zhao and Li Fu_

The Construction and Application of MOOCs University Computer Foundation in Application-Oriented University

_Ying San, Hui Gao, Qilong Han, and Junyu Lin_

Empirical Analysis of MOOCs Application in Sino-Foreign Cooperative Design Major Teaching

_Tiejun Zhu_

Crossing-Scene Pedestrian Identification Method Based on Twice FAS

_Yun Chen, Xiaodong Cai, Yan Zeng, and Meng Wang_

Vehicle Type Recognition Based on Deep Convolution Neural Network

_Lei Shi, Yamin Wang, Yangjie Cao, and Lin Wei_

A Biomechanical Study of Young Women in High Heels with Fatigue and External Interference

_Panchao Zhao and Zhongqiu Ji_

Data Clustering Algorithm Based on Artificial Immune Network

_Zongkun Li and Dechang Pi_

Multi-step Reinforcement Learning Algorithm of Mobile Robot Path Planning Based on Virtual Potential Field

_Jun Liu, Wei Qi, and Xu Lu_

A Novel Progressive Secret Image Sharing Method with Better Robustness

_Lintao Liu, Yuliang Lu, Xuehu Yan, and Wanmeng Ding_

The NCC: An Improved Anonymous Method for Location-Based Services Based on Casper

_Wenqi Liu, Mingyu Fan, Jie Feng, and Guangwei Wang_

Baymax: A Mental-Analyzing Mobile App Based on Big Data

_Fangyi Yuan, Hongzhi Wang, Shucun Tian, and Xin Tong_