2016 International Conference on Industrial Informatics - Computing Technology, Intelligent Technology, **Industrial Information Integration** (ICIICII 2016)

Wuhan, China **3-4 December 2016**



IEEE Catalog Number: CFP16E19-POD ISBN:

978-1-5090-3576-2

Copyright © 2016 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: CFP16E19-POD ISBN (Print-On-Demand): 978-1-5090-3576-2 ISBN (Online): 978-1-5090-3575-5

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



2016 International Conference on Industrial Informatics - Computing Technology, Intelligent Technology, Industrial Information Integration

ICIICII 2016

Table of Contents

Preface	xiv	
Conference Organization	X\	
Program Committee	xv	
Reviewers		
Keynote		
Plenary Talks	xx	
Ant Colony Optimization		
Accelerating Spatial Join Aggregation with R-Tree for MapReduce		
Regional Optimal Control Strategy of Electric Vehicle Based on the Spatial Load Forecasting Technology	6	
Research on the Estimation of Crowd Density Based on Video Image Processing	10	
Sishi Liu, Kefan Xie, Zhenjiang Zhu, and Ding Ma		
Variable Compensation Network for Achieving Constant Current or Voltage Output in IPT System	14	
Jiang-Hua Lu, Wen-Jing Li, Bo Li, and Guo-Rong Zhu		

Artificial Intelligence in Engineering	
Fatigue Detection of Drivers Based on Electroencephalograph	18
Artificial Neural Network Theory and Architectures	
A Dynamic Weighing Method for Portal Crane in Bulk Port: Based on Clustering and BP Neural Network	22
Extended Dissipativity of Discrete-Time Markov Jump Neural Networks with Mixed Delays	26
The External Characteristics Simulation System of Diesel Engine Based on Levenberg-Marquardt Algorithm	30
Linru Wen, Zhijun Li, Zheng Han, Xiaoyi Xie, and Rui Zhang The Optimizing Design of Wheeled Robot Tracking System by PID Control Algorithm Based on BP Neural Network Lichao Ma, Yunping Yao, and Meng Wang	34
Big Data	
Design of Elevator Monitoring Platform on Big Data	40
Exploring Chinese Language Evolution via Computer Corpus Analysis: A Case Study of Liru's Lexicalization and Grammaticalization	44
SPARK – A Big Data Processing Platform for Machine Learning	48
Bioinformatics	
DNA Sequence Splicing Algorithm Based on Spark	52
Computer Integrated Manufacturing Sytems	
Study on Ontology Model of Sports Products After-Sale O2O Service	57
Tunnel Construction Ventilation Monitoring System Based on Fieldbus Technology	61

Warehouse Management System Development Base on Open Source Web	
Framework	65
Chuanhong Zhou and Qi Fei	
Computer Vision	
A Method of Human Action Recognition Based on Spatio-Temporal Interest	
Points and PLSA	69
Ke Du, Ying Shi, Bowen Lei, Jie Chen, and Mingjun Sun	
A Method of SIFT Simplifying and Matching Algorithm Improvement	73
A Novel Framework for Container Code-Character Recognition Based	
on Deep Learning and Template Matching	78
Langqi Mei, Jianming Guo, Qing Liu, and Pingping Lu	
Image Enhancement Using Bright Channel Prior	83
Motion Multi-object Detection Method under Complex Environment	87
Moving Object Tracking Method Based on Improved Camshift Algorithm	91
Research on Crack Detection of Crystal Stone Based on the Laplacian Operator	96
Chun Xiao and Wei Wang	
Sub-Pixel Location of Motion Blurred Weak Celestial Objects in Optical Sensor	
Image Based on Elliptical 2D Gaussian Surface Fitting	100
Zhen Lei, Xiao Chen, and Ting Lei	
Technique of Log Piles Location Based on Visual Saliency in Port	105
Tobacco Plant Recognizing and Counting Based on SVM	109
Honghui Xie, Zhun Fan, Wenji Li, Yibiao Rong, Yang Xiao, and Lei Zhao	
Data Mining	
A Density-Based Clustering Algorithm for High-Dimensional Data with Feature	
Selection	114
Qi Xianting and Wang Pan	
Big Data Mining and Intercultural Business Discourse Studies: A Case Study	
of Li Ning's Corporate Social Responsibility Reports	119
Da-Wang Huang, Jin-Lin Chen, Pin Deng, and Li Lü	
Entropy-Based Mixed Data Transform Model	123

Online Platforms: Case Study DouYu TV	127
Research on Multi-sensor Information Fusion Algorithm with Sensor Fault Diagnosis	132
Deep Learning	
A Review of Soft Computing Based on Deep Learning	136
Land-Use Classification with Remote Sensing Image Based on Stacked Autoencoder Anzi Ding and Xinmin Zhou	145
Smoke Detection Based on Deep Convolutional Neural Networks	150
Evolutionary Design in Industry, Medicine and Social Development	
Implementation of Automotive Inverter Power Supply	154
Research on Evacuation Strategies to Prevent Stampedes in Large-Scale Events	158
Qiongqiong Wu, Shangnan Liu, Zhenjiang Zhu, and Hao Zhang	
Fuzzy Making Decision Support Systems	
Study of Fuzzy PID Control Based on Vehicle Seat Detection System	162
Hardware Implementations	
A Low Overhead Leakage Test Structure for TSVs of 3D ICs	166
Human-Computer Interaction	
A Communication Model for Large Scale Ship Handling Simulators	170

Industrial Informatics

Application of Naive Bayes Classifier in Stampede Risk Early-Warning of Large-Scale Activities	174
Zhe Fu, Hao Zhang, Qiang Chen, and Shangnan Liu	174
Big Data Oriented Macro-Quality Index Based on Customer Satisfaction Index and PLS-SEM for Manufacturing Industry	181
On the Strategy of Event-Driven Injection and Ignition Synchronous Control for SI Engine	187
Power System Frequency Estimation Based on Adaptive Notch Filter	191
Industrial Integrated Systems Engineering	
Modeling and Optimizing Control of Particle Quality for Drug Fluidized Bed Granulation Process	195
Zhengsong Wang, Le Yang, Dakuo He, Shuai Ding, and Bo Du	
Industrial Robotics	
A Manipulator Design Optimization Based on Constrained Multi-objective Evolutionary Algorithms	199
Yang Xiao, Zhun Fan, Wenji Li, Shen Chen, Lei Zhao, and Honghui Xie	
The Study of Applying the AGV Navigation System Based on Two Dimensional Bar Code	206
Chuanhong Zhou and Xinchang Liu	
Intelligent Decision Support Systems	
Analysis and Design of Public Places Crowd Stampede Early-Warning Simulating System	210
Shangnan Liu, Zhenjiang Zhu, Qiang Cheng, and Hao Zhang	
Design of Port Lightning Early Warning System Based on Cloud Technology	214
Formative Assessment Research of Youth Science and Technology Innovation Curriculum Based on Mind Map	218
Chuan-Hong Zhou, Yi Zhang, Xin-Chang Liu, Fei Qi, and Pu-Jia Shuai	
Optimal Charging Navigation Strategy for Electric Vehicles	222

Problems of PHM Technology Application in the Marine Gas Turbine Engine	
and Coping Approaches	226
Fang Youlong, Liu Dongfeng, and Yu Liangwu	
Research of Automatic Collision Avoidance Based on Ship Maneuvering Ting Liu, Zhen Huang, Wenlong Tang, and Zhao Wang	232
Intelligent Robotic Systems	
3D Indoor Map Building with Monte Carlo Localization in 2D Map	236
An Improved LWR Based Forcing Term Learning from DMPs	241
Various Robot Motor Skills Learning with PI2-GMR	246
Internet of Things (IoT)	
Research and Improvement of Ethernet Adapter Based on Power Line	
Communication	251
Yulong Hao, Jiaoyu Liu, and Anqi Wu	
Research of Intelligent Street Light System Based on ZigBee	255
Research on IoT Privacy Security Risks	259
Wang Xi and Luo Ling	
Knowledge-Based Systems	
Control for the Centrifugal Pump in the Simulation Platform of Power Plants	263
Wang Xv, Di Wei, and Cheng Lei	
Ship Structural Members Design and Optimization Based	
on Knowledge-Based Engineering	268
Modeling and Identification	
A Novel Current Sharing Method for Multi-phase LLC Converter	274
Sheng Wu, Ming Chen, Huan Xu, Lian-Yuan Liu, and Guo-Rong Zhu	
Harmonic Mitigation in Single-Phase H-Bridge Inverter Based on the DC Side	
Current DFT Analysis	278
Dingjun Zeng, Junchaojie Tang, Siyuan Ma, and Guorong Zhu	
Model Predictive Control for Electric Heaters	282
Di Wei, Xiangshun Li, and Cheng Lei	

Modelling and Control of Single Phase VIENNA Rectifier	286
Observability and Controllability Analysis of Pipeline Systems	290
Particle Size Analysis of Concrete Materials Based on AFCM and Marked Watershed Algorithm	294
SOC Estimation of Lithium Battery Based on Improved Kalman Filtering Algorithm	298
Multi-agent Systems	
Complex Network Effects in Large Multi-robot Collaborate Information System	303
Rough Sets and Rough Data Analysis	
Study on Method of Multi-feature Reduction Based on Rough Set in Passenger Counting	307
Swarm Intelligence	
Intelligent Mutation Operator of Biogeography-Based Optimization Algorithm	311
SEIR Evolutionary Simulation Model of the Infectious Disease Emergency	315
Various Applications in Industry and Social Development	
Parameter Extraction for Single-Diode Model of Solar Cell	319
Spatial Indexing for Effective Visualization of Vector-Based Electronic Nautical Chart	323
Yu Yu, Honghai Zhu, Li Yang, and ChengXiang Wang Study of Algorithms for Wavelet Packet in Howling Suppression System Xiaoyi Xie, Zhijun Li, Linru Wen, Zheng Han, and Rui Zhang	327

Other Topic in ICIICII 2016

A Case Study in Xianning to Evaluate the Livability of Small and Medium-Sized Cities	332
Liu Jun and Ruan Yi	
An Improved Teaching-Learning-Based Optimization Algorithm for Solving Economic Load Dispatch Problems	337
An Independent Variable Exclusively Coupled Chaotic System for	
a Pseudorandom Bit Generator	341
An Optimized Three-Phase Three-Level SVPWM Modulation Algorithm	345
Design of Programmable DC Electronic Load	351
Junran Peng, Yuepeng Chen, Yang Fang, and Shuran Jia	
Emergency Management Capability Evaluation System in Civil Aviation Industry	356
Qian Wu and Fengyu Ren	
Game and Strategy of China in the World's Negotiation of Iron Ore Price Limei Yang and Zhenjie He	360
Realization of CC and CV Mode in IPT System Based on the Switching of Doublesided LCC and LCC-S Compensation Network	364
Research on the Impact of Crowd Flow on Crowd Risk in Large Gathering Spots	368
Zimei Liu, Yun Chen, and Kefan Xie	
The Implementation of Water Cycle Control for 100KW Fuel Cell Test System	372
The Optimal Charging Strategy of EV Rational User Based on TOU Power Price	376
Hao Fan, Hui Hou, Xianbin Ke, Guorong Zhu, and Wei Chen	
The Study on the Neutral-Point Potential Balance Based on Coordinate System for Three-Level Inverter	380
Liang Wang, Zhihong Li, Chengzhi Pei, and Zheng Wang	
The Vector Control Research and Implementation of the Three-Phase Hybrid Stepping Motor	384
Qi Guan, Jiaoyu Liu, Yan Zhou, and Hongchao Qiu	
Traffic Time Series Simulation Analysis by Using MSE and MFDFA	388

Author Index	397
Yu Song and Kefan Xie	
in Emergencies Based on Citespace Software	393
Visualization Analysis of Research Hotspots and Fronts of Crowd Behavior	