

# **2017 Second International Conference on Mechanical, Control and Computer Engineering (ICMCCE 2017)**

**Harbin, China  
8 – 10 December 2017**



**IEEE Catalog Number: CFP17O22-POD  
ISBN: 978-1-5386-2629-0**

**Copyright © 2017 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:	CFP17O22-POD
ISBN (Print-On-Demand):	978-1-5386-2629-0
ISBN (Online):	978-1-5386-2628-3

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# 2017 Second International Conference on Mechanical, Control and Computer Engineering

## ICMCCE 2017

### Table of Contents

<b>Preface</b> .....	x
<b>Conference Organization</b> .....	xi
<b>International Technical Program Committee</b> .....	xii
<b>Reviewers</b> .....	xiii

---

### Control Theory and Control Engineering

A Fusion Detection Algorithm of Motional Ship in Bridge Collision Avoidance System .....	1
<i>Shu Zhou, Shenggeng Hong, Qian Guo, Xindong Liu, Can Chen, and Xinzhen Zhang</i>	
A Review of Lane Perception and Automobile Control Based on Computer Vision .....	6
<i>Liu Tianqi</i>	
Autonomous Road-Traveling and Monitoring Robot.....	12
<i>Long Cheng, Jingyang Tang, Tao Li, Li Zhang, Jinquan Hang, and Zihan Wang</i>	
Kinematic Analysis of Tokamak In-Vessel Orbiting Robot .....	17
<i>Sheng Yan, Yong Cheng, Chen Lu, Xuanchen Zhang, Hongtao Pan, and Shanshuang Shi</i>	
Dynamic Analysis of Varied Gears Meshing Coupled Vibration Models of Marine Power Rear Drive System .....	22
<i>Junyi Wen, Yongmei Wang, and Xigui Wang</i>	
Development of the Maintenance Robot with Electrification Used in Substation .....	30
<i>Xin Zhang, Ronghui Huang, Xun Li, Jingwen Ai, Xu Dong, Jian Li, and Zhenli Wang</i>	
A Sensor Cleaning System Integrated with Rotary Washing and Ultrasonic Cleaning .....	34
<i>Guoqiang Ma, Yunchen Tian, Xufeng Hua, and Huiyong Shan</i>	

Application of FMECA Analysis in Mechanical Condition Monitoring of Breaker .....	38
<i>Zhao Shutao, Wei Yao, He Mengyuan, and Wu Chengjian</i>	
The Motion Control System Based on ARM and Multi-sensor Information Fusion Technology .....	42
<i>Liu Rong, Yu Weiyu, and Yang Lei</i>	
One Key Reset System for Substation Robot Based on Multi-sensor Fusion .....	46
<i>Ronghui Huang, Xin Zhang, Haiming Yang, Jingwen Ai, Yan Zhang, Jian Li, and Zhenli Wang</i>	
Robot Control System for Live Maintenance of Substation Equipment .....	50
<i>Guoxing Wu, Shungui Liu, Ronghui Huang, Xin Zhang, Zhenli Wang, Yan Zhang, and Jian Li</i>	
Review of Vertical Take-Off and Landing Aircraft .....	53
<i>Shuhe Zhang</i>	

## Computer-Aided Design and Manufacturing

Dynamic Management and Application of Spatial Data for Dam Group Safety Monitoring Based on GIS .....	57
<i>Jin Youjie, Zhou Baibing, and Liu Na</i>	
A Location Method for Ceramic Tile Based on the Combination Features .....	62
<i>Linjie Yang, Qiming Li, Chengyun Bai, and Jun Li</i>	
Design of On-Line Monitoring System for Wind Turbines Transmission Mechanism .....	67
<i>Shuaifei Zhu and Fang Yang</i>	
Investigation on Measurement for Micro Unbalance of Tiny Cylindrical Rollers of the High-Speed Precision Rolling Bearings .....	71
<i>Xiao Wang, Xin Sui, Yujun Xue, Jishun Li, Wei Ma, and Chunyang Liu</i>	
Design of an ADSP-Based Distributed Wind Turbines Condition Monitoring System for Wind Farms .....	75
<i>Xiao Wang, Xin Sui, Wei Ma, and Yujun Xue</i>	
Design of a Metronome Based on the Idea of "ANDON" .....	79
<i>Xi-qiang Ma, Shuai Dong, Wei Ma, Yujun Xue, and Ji-shun Li</i>	
Precision Cylindricity Error Measurement System Design and Surface Topography Reconstruction .....	83
<i>Chunyang Liu, Yujun Xue, Xiqiang Ma, Xin Sui, Donghong Si, and Jishun Li</i>	
Parametric Design of Complex Elastic Components .....	87
<i>Dong Yong-xiang, Si Dong-hong, Xue Yu-jun, and Li Ji-shun</i>	
Design and Analysis of a Planar Flexible Cable Driven Target Motion Device .....	92
<i>Jianyu Ma, Fang Yang, and Yujun Xue</i>	

Trace Function Representation of m-Subsequence .....	96
<i>Wanli Chen, Hong Lv, Peng Qi, and Quanling Sun</i>	
Software Reconfiguration Technology for Serviceable Satellite OBDH System .....	100
<i>Jiang Lianxiang, Xu Peipei, and Fang Xuyang</i>	
Effect of Torsional Load on the Stress Distribution in Weld-Bonded Steel Disc .....	105
<i>Min You, Junjun Liu, Jianjun Xu, Xiang Li, and Jingrong Hu</i>	
Effect of Disc Size on Natural Frequency and Stress Distribution in Adhesively Bonded Steel Structure .....	109
<i>Jianli Li, Yingying Li, Min You, Haizhou Yu, and Zhongming Chen</i>	
Rectifier System Design Research of Wind Turbines Grid .....	113
<i>Fanzheng Zeng, Liyue Zhang, Xiongzen Yang, and Weiliang Zhang</i>	
Design and Implementation of the Program of Customer Risk Monitoring and Scoring for Risk Early Warning .....	118
<i>Chunyan Xue</i>	
An Online Name Disambiguation Method Based on Entity and Property Co-occurrence .....	122
<i>Lian Duan, Jiuming Huang, Shengdong Zhang, Zhichao Wang, Yi Chen, Yue Hu, and Zhonghe He</i>	
Experimental Study on Cutting Force during Milling Process of 022Cr17Ni12Mo2 Stainless Steel .....	126
<i>Xu Chuangwen, Zhang Ling, Shi Zhicheng, and Dou Jianming</i>	
Study and Implementation on the Monitor of Liquid Level of Liquid Scintillator .....	130
<i>Zhu Shiheng, Xu Xiangmin, Zhang Zhijiang, and Yang Lie</i>	
Super-Resolution Deblurring Algorithm for Generative Adversarial Networks .....	135
<i>Bing Tian, Wentao Yan, Wei Wang, Qi Su, Yin Liu, Guangxiu Liu, and Wanguo Wang</i>	
AI-Driven Question-Answer Service Matching .....	141
<i>Mengqin Yang, Jiang Zhong, Peiyun Hu, and Lei Cui</i>	
Optimized Selection of Merit Function in Computer-Aided Alignment of Precision Optical System .....	146
<i>Luo Yong</i>	
Comparison of Support Vector Machine and Softmax Classifiers in Computer Vision .....	151
<i>Xingqun Qi, Tianhui Wang, and Jiaming Liu</i>	
Study on Inherent Frequency Parameters of Planetary Transmission System Based on Power Dual Branch .....	156
<i>Yu Wang, Junyi Wen, Yixiang Liu, and Xinbo Zhang</i>	

FPGA-based Matrix Keyboard Common IP Core Design and the Implementation Using Verilog HDL .....	161
<i>Weihua Huang and Licheng Jia</i>	
 <b>Wireless Communication and Wireless Networking</b>	
An Improving of Load Balancing in Clustering Algorithm for Wireless Sensor Network Based on Distance .....	165
<i>Chih-Hsien Chien and Ming-Shi Wang</i>	
Transfer Learning for Air Traffic Control LVCSR System .....	169
<i>Jiawen Wang, Shaohan Liu, and Qun Yang</i>	
 <b>Computer Simulation and Modeling</b>	
A New Spatial Encoding Method for Sparse Binary Data .....	173
<i>Weiwei Duan, Jianxin Luo, Qi Hu, Guiqiang Ni, and Yi Gao</i>	
A Review on Entity Relation Extraction .....	178
<i>Qianqian Zhang, Mengdong Chen, and Lianzhong Liu</i>	
Analysis of the Impact of Online Courses on the College Student Learning Habit .....	184
<i>Jiangfeng Li</i>	
Affine Motion Model Based Rolling Shutter Removal Algorithm .....	188
<i>Yu Wang</i>	
Influencing Factors of Parachute-non-Bomb Trajectory in the Fuel-Air Explosives .....	194
<i>Li Qizhong, Wang Ye, and Wang Zhongqi</i>	
Underwater Mission Planning Algorithm of Mustered Helicopters .....	199
<i>Li Zhang and Xing Liu</i>	
The Network Data Parallel Parsing Algorithm Based on MapReduce .....	203
<i>Zhang Huimin and Feng Linsheng</i>	
A P2P Streaming Media Segmentation Method Based on Scalable Video Coding Data Characteristics .....	208
<i>Pang Xiyu, Wang Cheng, and Xi Zhonghua</i>	
A Pedestrian Detection Method Using Background Modeling and Object Proposal .....	212
<i>Dongyue Yan and Jianchen Su</i>	
A Novel Feature Map for Human Activity Recognition .....	216
<i>Guangyu He, Xinze Luan, Junyi Wang, and Xiaoting Wang</i>	
Numerical Simulation Method for Three-Dimensional Flow Field of Multistage Axial Flow Compressor .....	220
<i>Yu Wang, Junyi Wen, Yixiang Liu, and Xinbo Zhang</i>	

Task Classification: Towards Tasks Correlation for Combinatorial Auction Mechanism in Crowdsourcing .....	225
<i>Naiting Xu, Shuai Xu, Feiyang Li, Jiahao Zhang, and Shasha Li</i>	
Statistical Analysis of the Relationship between Visual Features and Personality .....	232
<i>Jian Zhang and Zhiqiang Wei</i>	
<b>Author Index .....</b>	<b>236</b>