

2018 IEEE International Conference on Mechatronics, Robotics and Automation (ICMRA 2018)

**Hefei, China
18-21 May 2018**



**IEEE Catalog Number: CFP18P26-POD
ISBN: 978-1-5386-5271-8**

**Copyright © 2018 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:	CFP18P26-POD
ISBN (Print-On-Demand):	978-1-5386-5271-8
ISBN (Online):	978-1-5386-5270-1

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

CURRAN ASSOCIATES INC.
proceedings
.com

2018 IEEE International Conference on Mechatronics, Robotics and Automation ICMRA

Table of Contents

Message from the Conference Chair	vii
Organizing Committees.....	ix

◆ Electronic Information Technology and Mechatronics

System Design of GEO-LEO Bistatic SAR with High Resolution and Wide Swath	1
<i>Lu Zheng, Liu Shuhao, Wang Yuekun</i>	
Simulation Study on Production System of Hardware Sets.....	6
<i>Xiaotong Wang, Chuanhong Zhou, Yi Zhang</i>	
Rotor Position Estimation of Sensorless PMSM Based on Extended Kalman Filter.....	12
<i>Gao Tian, Yang Yan, Wang Jun, Zhou Yu Ru, Zhao Xiao Peng</i>	
Modeling and Passivity-PI Control of a Fuel Cell-Supercapacitor Hybrid Energy Storage System	17
<i>Li Hao, Yang Fan</i>	
Impact on Motor Speed of a New Rotary Vibrating Screen with Material Kinematics Characteristics	22
<i>Hongwei Yan, Yajie Li, Yang Wang, Fei Yuan, Fangxian Peng</i>	

◆ Control Theory and Control Engineering

Two Degrees-of-Freedom Helicopters with Adaptive Robust Control for Trajectory Tracking	27
<i>Yinfei Zhu, Shengchao Zhen, Hao Sun</i>	
Leakage-Type Adaptive Robust Control for Nonlinear Bulldozer Link Lever System.....	35
<i>Chenming Li, Shengchao Zhen, Hao Sun, Han Zhao</i>	

Frequency Shaping Backstepping Robust Attitude Maneuver of Flexible Spacecraft.....	42
<i>Liu Shuhao, Lv Zheng</i>	
A Novel Data-Assisted Model and Discrete-Time Sliding Mode Steering Controller of Robotic Fish	47
<i>Hai Wang, Chunlong Mi, Zhenghao Li, Ningning Hou, Guangming Xie</i>	
Fuzzy Sliding Mode Adaptive Control of Dual-Motor Driving Servo System	52
<i>Haibo Zhao, Chengguang Wang</i>	
The Design on Hardware-in-the-Loop Test System of Vehicle Control Unit Based on xPC Technique for Electric Vehicle	56
<i>Wei Wang, Chong Guo, Fufan Qu, Chunying Wu</i>	
Weight Changing Model Predictive Controller for Adaptive Cruise Control with Multiple Objectives	62
<i>Usman Munir, Zhang Junzhi</i>	
Design and Optimization of an Intelligent Rehabilitation Wheelchair with Sit-To-Stand Trajectory	67
<i>Chengxiang Sun, Chongmeng Liu, Wei Zhuo, Kangren Zhao, Ping Zhao</i>	
A Multi-Model MLE-PCA Method for Unstable Industrial Process Monitoring	75
<i>Tian Fang, Dongmei Fu</i>	
Control Strategies for Reducing VOCs Emission Process Based on Empirical Data	80
<i>Yu-Qing Wang, Jia-Wei Wang, Zi-Ang Zhu, Chao-Fan Zhou, Yi-Yao Kou, Jing Sun, Zheng-Wei Mei, Zi-Wu Li, Peng Wu, Dong-Hu Wang, Si Zhang, Wen-Li Zhang</i>	
◆ Computer Science and Information Engineering	
Commercial Vehicle Cab Fatigue Load Decomposition and Validation	85
<i>Wei Li, Junhong Dong, Qiangqiang Dong</i>	
High Precise Position Method Based on 2 CCD Cameras in Alternate-Angle Image Acquisition Mode	90
<i>Wenchang Zhang, Ronghao Wang, Lijuan Ji, Running Cao, Lei Chen</i>	
Robust Hand Gesture Input Using Computer Vision, Inertial Measurement Unit (IMU) and Flex Sensors	95
<i>Ting Kwok Chan, Ying Kin Yu, Ho Chuen Kam, Kin Hong Wong</i>	
Nonlinear Synchronization of A New Lorenz System and Its Application in Secure Communication	100
<i>Ze-bin Li, Xiao-fei Zhang, Wen-ming Wang, Gang Zhang</i>	
A GUI Software for Automatic Assembly Based on Machine Vision	105
<i>Hao-dong Chen, Yi-fan Wang, Zheng Guo, Wen-xiu Chen, Ping Zhao</i>	

◆ Materials, Machinery and Manufacturing Engineering

Design, Analysis and Electromagnetic Simulation of A Multi-Disc Automotive Magnetorheological Brake	112
<i>Daoming Wang, Lan Yao, Biao Wang</i>	
Design and Experiments on A Hybrid Electric Drive System for Underground Coal Mine Locomotives.....	117
<i>Jusheng Bao, Shuai Yang, Shirong Ge, Yan Yin, Chao Chen, Bin Luo</i>	
Residual Stress Analysis of Double Cold Extrusion for Titanium Alloy Lug	122
<i>Yongjie Zhang, Yanyun Xu, Zheng Yang, Yingying Wu</i>	
Finite Element Simulation and Analysis of Stainless Steel 30CrMnSi Orthogonal Cutting.....	127
<i>Ran Wang, Tan Luo, Xiaobao Lei</i>	
Bearing Fault Diagnosis Based on De-phase Algorithm and Myriad Filtering	131
<i>Liangliang Wang, Ping Gu, Xinghui Zhang, Kuo Chi</i>	
A Mechanical Part Sorting Method Based on Fast Template Matching.....	135
<i>Yi-Fan Wang, Hao-dong Chen, Kangren Zhao, Ping Zhao</i>	
A Tactile Sensor for Measuring the Hardness of Soft Materials.....	141
<i>Ya Yong Wu, Jing Jin Shen</i>	

◆ Robot Design and Control

A New Type of Flapping-Wing Robot Based on the Stephenson II Six-Bar Mechanism.....	145
<i>Zheng Guo, Zhong-yang Guo, Liang Zhao, Shao-yun Zhou, Wen-xiu Chen</i>	
Adaptive Robust Constraint-Following Control for Lower Limbs Rehabilitation Robot.....	150
<i>Xiaolong Chen, Hao Sun, Shengchao Zhen, Han Zhao</i>	
Design and Fabrication of a Soft Robotic Manipulator Driven by Fiber-Reinforced Actuators ..	157
<i>Yaxi Wang, Qingsong Xu</i>	
Modular Design Research for Caddie Robot	162
<i>Hailin Cao, Zhenghong Zhu</i>	
Research of Two-Wheeled Self-Balanced Robot' s Disturbance Rejection Control on Uneven Pavement.....	167
<i>Chao Wang, Zichang Guo, Jin Huang, Yaguang Wang</i>	
Design and Analysis of A Cable-Driven Parallel Robot for Waist Rehabilitation.....	173
<i>Tao Zhao, Sen Qian, Qiao Chen, Zhi Sun</i>	
Dynamic Start-up Accelerating Characteristic of the Flexible Robotic Manipulator based on Virtual Prototype Experiment	179
<i>Yufei Liu, Xi Zhang, Dezhong Xu, Buyun Wang</i>	

Dynamic Effect of Decreased Connecting Stiffness for Flexible Robotic Manipulator based on Vibration Energy Distribution Characteristic	183
<i>Xi Zhang, Yufei Liu, Dezhong Xu</i>	
Trajectory Planning for A Hydraulic Direct-Driven Joint Robot	188
<i>Chen Guangzhu, Deng Yi, Li Dongdong, Yin Feng, Chen Zhengyang</i>	
Research on Bend-through Behavior of Pipeline Robot Based on ADAMS	194
<i>Hongwei Yan, Fangxian Peng, Jianqiang Ma, Fei Yuan, Yajie Li</i>	
A Cable-Driven Parallel Robot for 3D Printing	199
<i>Yanqi Zhong, Sen Qian</i>	
Software Design for CNC System Based on Event-Driven Framework	204
<i>Kongyuan Hu, Huabing Zhu, Bolin Dong</i>	
Design and Study of New Electric Control Device for Environment Protection and Energy Saving Buses Doors	211
<i>Wang Xiaoyuan, Wang Nengyuan, Chenghaijun</i>	