

# **2009 International Conference on Measuring Technology and Mechatronics Automation**

**(ICMTMA 2009)**

**Zhangjiajie, China  
11 – 12 April 2009**

**Volume 1  
Pages 1-468**



**IEEE Catalog Number: CFP0913G-PRT  
ISBN: 978-1-4244-3657-6**

# 2009 International Conference on Measuring Technology and Mechatronics Automation

---

## ICMTMA 2009

# Table of Contents

## Volume - 1

---

### Session 1: Novel Sensor and Sensor Reliability

A MEMS Flow Sensor and Its Application in Adaptive Liquid Dispensing .....	3
<i>Yaxin Liu, Liguo Chen, and Lining Sun</i>	
A New Kind of Non-contact Stress Sensor Based on Magnetoelastic Effect .....	8
<i>Yanping Shi and Yifei Shi</i>	
Application of Durability Sensors in Reinforced Concrete Liner of Subsea Tunnel .....	12
<i>Peng Zhang, Tie-jun Zhao, Zu-quan Jin, and Ji-zeng Zhao</i>	
Distributed Optical Fiber Sensor for Virtual Monitoring of Turbine Rotor's Temperature .....	16
<i>Lin Wang, Xiaofei Yang, and Buyun Sheng</i>	
Fabrication and Characterization of Micro Opto-electronic Sensor .....	20
<i>Qing-gang Liu, Zhi-hong Yan, Ling Zhao, Xiao-na Lou, and Xiao-tang Hu</i>	
Filtering and Temperature Correction Algorithms for Smog Interference in Temperature Measurement Based on CCD Image Sensor .....	24
<i>Xiaoqi Peng and Yuan Sun</i>	
Inductive Level Measurement Sensor with Magnetic Fluid .....	28
<i>Hairong Cui, Decai Li, and Mingli Sun</i>	

Magnetic Sensor Calibration Based on Multi-frequency Signal .....	31
<i>Yanzhang Wang, Defu Cheng, Hao Lu, and Yunxia Wan</i>	
Measurements of Temperature and Residual Strain during Fatigue of a CFRP Composite Using FBG Sensors .....	35
<i>Xiaoyan Shen and Yuchi Lin</i>	
Mercury Ion Selective Thin Film Sensor Prepared by Pulsed Laser Deposition Technique .....	39
<i>Hong Men, Zongnian Ge, Xiaozhe Zhu, and Shanshan Zhang</i>	
Parameter Determination of Dynamic Sensor Model with Particle Swarm Optimization Technique .....	43
<i>Xiaodong Wang</i>	
Particle Filters Based Fault Diagnosis for Internal Sensors of Mobile Robots .....	47
<i>Zhuohua Duan and Zixing Cai</i>	
Precision Measurement System for Leveling Degree Based on Laser Sensor .....	51
<i>Ruiyin Tang and Hongkun He</i>	
Research of 3D Spatial Localizing System Based on PSD Sensor .....	55
<i>Ying-gang Zhou, Yan-gen Xie, Dan Zhan, and Guang-ping Yu</i>	
Study on Surface Treatment of Double Grid Air Counter Sensor .....	59
<i>Xiao-qing Yuan and Yi-kai Shi</i>	
The Development of Infrared Temperature Sensor Based on Thermopile Detector TPS334 and PGA309 .....	62
<i>Ya-xiao Wang and Wen-Hui Zhang</i>	
<b>Session 2: Sensor Systems and Actuators</b>	
A Knowledge Based CAD System for Hydraulic Actuators .....	69
<i>Jun Wang and Qingzhi Meng</i>	
A Linear Dielectric EAP Actuator with Large Displacement Output .....	73
<i>Huaming Wang and Chenggang Li</i>	
A Novel Three Degree-of-Freedom Force Sensor .....	77
<i>Le Chen and Aiguo Song</i>	
Analysis of the Tip-Timing Precision of Double-Shielded Capacitive Pulse Sensor .....	81
<i>Fajie Duan, Menglin Li, Ouyang Tao, and Xianghong Kong</i>	
Design of Intelligent Dissolved Oxygen Detecting System Based on CAN Bus and Embedded USB Host .....	85
<i>Xingqiao Liu, Yang Liu, Xiaoxia Gong, and Hailian Zhang</i>	
Effect of Sensor Resolution on the Accuracy of Positioning Stage .....	89
<i>Teng Li, Yanjie Liu, and Lining Sun</i>	
Embedded Yarn Tension Control System Based on the Design of the Sensor .....	93
<i>Jian-gang Zhang, Xiao-guang Wu, Li Zhu, Chao Yu, Wen-bin Zhu, and Jin-bai Zhang</i>	

Flexural Mechanism Design Analysis for a New Piezoelectric Inchworm Actuator .....	98
<i>Zhaocheng Zhang and Hong Hu</i>	
On-Line Measure System of the Temperature in the Synthetic Ammonia Tower Based on the DS18B20 Temperature Sensor .....	102
<i>Jianping Zhang</i>	
Research of CMLD-CFAR Detecting Algorithm in Radar Reconnaissance Receiver .....	105
<i>Shuhua Wei and Xiaojun Wang</i>	
Research on a New Type of Sea Water Hydraulic Servovalve Driven by Diphase Opposing Giant Magnetostrictive Self-Sensing Actuator .....	109
<i>Xinhua Wang, Simin Wang, Juyin Liu, and Wei Li</i>	
Research on Thickness Measurement of Transparent Object Based on CCD Vision System .....	113
<i>Ni Yang, Yu-tian Wang, Jiang-tao Lv, and Huan-huan Li</i>	
Sliding Mode Control of an Actuator .....	117
<i>Zhiqiang Liu, Yanhong Wu, and Guangcai Han</i>	
<b>Session 3: Sensor Networks</b>	
An Adaptive Soft Sensor for Mill Load Measurement Based on PCA and FasArt Neural Fuzzy Networks .....	123
<i>Gangquan Si, Hui Cao, Yanbin Zhang, and Lixin Jia</i>	
Analysis of Relationship between Batch Drilling Process and Multi-sensor Synchronization Signals .....	127
<i>Youhang Zhou and Jianxun Zhang</i>	
Design of CAN/GPRS Gateway for Vehicle Remote Communications .....	131
<i>Yong Xu, Qun-li Yang, and Zhang-hua You</i>	
Hierarchical Regression for Data Acquisition in Wireless Sensor Networks .....	134
<i>Qiuyue Wang, Chaojun Hou, Xuemei Guo, and Guoli Wang</i>	
Plant Running Management Based on Wireless Sensor Network .....	138
<i>Hui Wang, Youshan Hou, and Xin Yu</i>	
Research on Traffic Monitoring Network and Its Traffic Flow Forecast and Congestion Control Model Based on Wireless Sensor Networks .....	142
<i>Laisheng Xiao, Xiaohong Peng, Zhengxia Wang, Bing Xu, and Pengzhi Hong</i>	
Study of the Multi-parameter Measuring System Based on Wireless Sensor Network .....	148
<i>Xingqiao Liu, Chengchun Li, Xiangmei Zhang, and Yang Liu</i>	

## Session 4: Instrument Technology and Device Monitoring

A Digital Method for Detecting Hydraulic Press Column Stress Based on Profibus-dp Fieldbus .....	155
<i>Hui Chen, Jianping Tan, and Jinli Gong</i>	
A Measurement Method of Tool Nose Radius Based on Dimension Errors of Machined Workpiece in CNC Finish Turning Operation .....	159
<i>Jianlai Zhou, Nanqiao Zhang, and Shuchu Liu</i>	
A Method for Measuring Water Content of Oil Based on the Propagation of Electromagnetic Waves .....	163
<i>Yanpeng Sun, Yuan Zhang, and Peng Peng</i>	
A New Method on Measuring Moisture Content in Gas .....	166
<i>Lichun Xiao, Qiang Li, Zhijiang Ding, and Jingfei Yang</i>	
A Novel Measuring Method of PMSM Nonlinear Incremental Inductances .....	170
<i>Xin-tong Jiang, Wei-kai Li, Wei Li, and Hong-wei Zhu</i>	
Acoustic Tomography for Detecting a Hot Spot in Grain Bulk .....	174
<i>Hua Yan, Ke Xin Cui, Li Jun Liu, and Yue Qi</i>	
An Analytical and Experimental Study of Grinding Temperature for Heavy Duty Cam .....	178
<i>Rong-lian Chen, Wei-ming Cheng, Zhi-hong Hu, and Xiu-rong Wang</i>	
Based on Measurements of Dynamic Wheel Braking Force Detection Vehicle Trajectory Study .....	182
<i>Bing Li and Meng Chen</i>	
Capacitive Silicon Micro-accelerometer Detecting Technology Research .....	186
<i>Yan Li, Ling Wang, and Jun Liu</i>	
Condition Monitoring for Bearing Using Envelope Spectrum of EEMD .....	190
<i>Shufeng Ai, Hui Li, and Yuping Zhang</i>	
Cross-Sectional Reverse Measurement Technique Research .....	194
<i>Wei Wang, Jun Hong, and Yiping Tang</i>	
Design and Development of Small-Size Stiffness Surveying Instrument for Sheet Metal .....	198
<i>Rong Lu, Xiangning Lu, and Gang Chen</i>	
Design and Implement of Multifunctional Monitoring System for the Suspension and Guidance System of Maglev Train .....	202
<i>Chunxia Zhao, Longhua She, and Wensen Chang</i>	
Design and Noise Control of the Portable Wear Debris Concentration Detector .....	206
<i>Hongbo Fan, Yingtang Zhang, Zhining Li, and Hongfei Luo</i>	
Development of Non-contact Surface Roughness Measurement in Last Decades .....	210
<i>XiaoMei Xu and Hong Hu</i>	

Development of the Automated Impedance Measurement System Based on the Slotted Line .....	214
<i>Shuhong Chen, Xiaofeng Yuan, Chuanqiang Yu, and Qiuwen Zhao</i>	
Dynamic Tension Allocation of Ship Mobile Mooring System under Sea Wind .....	218
<i>Wangqiang Niu, Yan Zhang, Wei Gu, and Jianxin Chu</i>	
Extracting Partial Discharge Signals of Generator Based on Elevated Minimum Description Length Criterion and Fast Fourier Transform .....	222
<i>Yan Zhao and Xiaojun Liu</i>	
Inductance Transducer for Pressure Difference Measurement with Magnetic Fluid .....	226
<i>Ruican Hao, Decai Li, and Guoqiang Dong</i>	
In-situ Monitoring of Active Crack in Steel Structure Using Acoustic Emission Technique .....	229
<i>Li Li, Zhongxiao Peng, and Meiyun Zhao</i>	
Lift Measurement System of Bionic Fins Stabilizer at Zero Speed .....	233
<i>Yu Wang and Chunmei Hua</i>	
Measurement of Dense-Phase Bed Height in CFB Boiler Based on Flame Image Processing Technique .....	237
<i>Zi-xue Luo, Dun-dun Wang, Duan Lian, and Huai-chun Zhou</i>	
Measuring of Impact Force and the Crush Distance of the Cylindrical Shell Impacted by Mass .....	241
<i>G. Y. Lu, Zhifang Liu, Zhijun Han, and S. Y. Zhang</i>	
Noise Attenuate Research of Resistance Muffler with Different Discel Rotational Speed .....	244
<i>Xiaodong Hu, Jidai Wang, Aiqin Sun, Yiqi Zhou, and Jianhua Fang</i>	
Oil Contamination Monitoring Based on Dielectric Constant Measurement .....	249
<i>Dingxin Yang, Xiaofei Zhang, Zheng Hu, and Yongmin Yang</i>	
Online Performance Measurement Arithmetic Research and Application on Novel Swing Movable Teeth Transmission System .....	253
<i>Yali Yi, Zijun An, and Herong Jin</i>	
Research on Salinity Detecting Based on Embedded CAN-Ethernet Gateway .....	257
<i>Xingqiao Liu, Xiaoxia Gong, and Yang Liu</i>	
Study on Detection of SF6 Gas Leakage Based on Photoacoustic Spectrometry .....	261
<i>Yuanzhe Xu, Hongjing Zhou, Bo Li, and Xin Zhao</i>	
The Principle and Analysis of Flying Projectile Coordinate Measure in Multi-screen Target .....	266
<i>Hanshan Li and Zhiyong Lei</i>	
The Testing Techniques of Gyro Stabilized and Opto-electronic Tracking Platform .....	270
<i>Zhou Tao, Wang Lei, and Weiqun Shu</i>	

## Session 5: Virtual Instruments

Analysis of INS Aided Signal Acquisition Based on Navigation Satellites Software Receivers .....	277
<i>Xiaofeng He, Xiaoping Hu, Kanghua Tang, Liangqing Lu, and Meiping Wu</i>	
Application of Soft Sensor Based on LS-SVM on Estimation of Alumina Powder Flow .....	281
<i>Chunyan Lu, Wei Li, and Weirong Liu</i>	
Data Acquisition and Processing of Embedded Network Controller .....	285
<i>Jing-rui Ma, Xue-ren Dong, Yi-ping Sun, and Qiu-xia Lu</i>	
Design and Study of Fiber Optic Strain Demodulation System Based on LabVIEW .....	288
<i>Li-ying Lang, Lan Shen, and Jian-jiao Zhao</i>	
Design of Power Quality Monitoring System Based on LabVIEW .....	292
<i>Qiu Tang, Zhaosheng Teng, Siyu Guo, and Yaonan Wang</i>	
Development and Experimental of a Multifunctional Instrument for Fabricating Glass Microfluidic Device .....	296
<i>Lili Mu, Huawei Jin, and Liya Hou</i>	
Mine Pump Comprehensive Performance Testing System Based on Labview .....	300
<i>Guimei Wang, Shanlin Jiao, and Hui Song</i>	
Photoacoustic Method to Detect CO and Soot Particles Generated by Fire .....	304
<i>Tao Chen, Hongyong Yuan, and Zhanhui Sun</i>	
Remote Data Acquisition and Signal Processing System Based on LabVIEW .....	308
<i>Bingsheng Wu and Chaozhi Cai</i>	
Research on Intelligent Temperature and Humidity Memory Instrument Based on USB Interface .....	312
<i>Xiaoshun Zhao, Huali Yu, and Shuxia Lui</i>	
Research on Key Technologies of Remote Monitoring Platform for Shearer .....	316
<i>Zhong-bin Wang, Wen-feng Ni, Shu-bin Li, and Zhi-peng Xu</i>	
Research on Measurement of Aggregate Micro-structure Using Laser and Fractal Theory and the Relationship with Asphalt Pavement Performance of Anti-slide .....	320
<i>Yangyong Sun and Xiaoning Zhang</i>	
Research on Missile-Borne Storage Measurement System .....	326
<i>Ming Li and Mingjie Liu</i>	
Research on Monitoring Method of Magnetism Balance Adjusting Environment .....	330
<i>Zhiliang Ren, Guang Chen, Yaobo Li, and Tao Zhang</i>	
Research on Portable Instrument for Determining Hemoglobin Concentration in Whole Blood .....	334
<i>Yufeng Yao, Jianwen Zhao, Bo Huang, and Yajun Zhen</i>	

Research on the Measurement of Thrust Vector for a Liquid-Propellant Rocket Motor Based on Piezoelectric Quartz .....	338
<i>Jun Zhang, Baoyuan Sun, Zongjin Ren, and Yue Liu</i>	
Research on the Methods of the Measurement of Printing Pressure in Offset Press .....	342
<i>Shuqin Wu, Yiming Wang, Chengwen Chai, and Jianjun Bai</i>	
Simulative Measurement on Conductivity and Permeability Distribution in Sensing Field of Electromagnetic Tomography .....	345
<i>Dong Liu and Feng Dong</i>	
Solid Mass Flux Measurement of the Gas-Solid Flow Using the Elbow-Ultrasonic .....	349
<i>Yanjun Zhao, Xinyue Shi, and Shimin Wang</i>	
Stereo Cameras Self-Calibration Based on SIFT .....	352
<i>Ran Liu, Hua Zhang, Manlu Liu, Xianfeng Xia, and Tianlian Hu</i>	
Study of Laser Non-contact Measuring Method of Circle Path Applied to Precision Analysis of Three-Axes CNC Machine Tools .....	356
<i>X. S. Wang, Y. Li, and Y. C. Yu</i>	
Study on New Methods of Improving the Accuracy of Leak Detection and Location of Natural Gas Pipeline .....	360
<i>Shuqing Zhang, Tianye Gao, Hong Xu, Guangpu Hao, and Zhongdong Wang</i>	
Study on Virtual Measurement Technology for Near-Bit Dynamic Forces of Bottom-Hole Assembly .....	364
<i>Cheng Li, Tianhuai Ding, Peng Wang, and Ken Chen</i>	
Synthetic Aperture Ultrasonic Imaging in Pipeline Inspection .....	368
<i>Yinghua Du and Shijiu Jin</i>	
The Application of Difference Algorithm to PPW Interference Cancellation in Heart Rate Detection .....	371
<i>Xiaodong Liu, Yarong Li, and Baoqing Yang</i>	
The Oil Viscous Force Measurement System Based on Embedded System .....	375
<i>Jingwen Tian, Shiru Zhou, and Meijuan Gao</i>	
<b>Session 6a: Image and Signal Processing (I)</b>	
3-D Numerical Simulation of Smoke Flow during Tunnel Fire .....	381
<i>Zhiming Qu and Xiaoli Wang</i>	
A Frequency Band Energy Analysis of Vibration Signals for Tool Condition Monitoring .....	385
<i>Chuangwen Xu, Zhe Liu, and Wencui Luo</i>	
A Hybrid Method for Visual Near-Infrared Spectral Calibration for Discrimination of Panax Species .....	389
<i>Xiaojing Chen, Meng Xu, and Xiangou Zhu</i>	



A Kind of Visual Cryptography Scheme for Color Images Based on Halftone Technique .....	393
<i>Wei Qiao, Hongdong Yin, and Huaqing Liang</i>	
A Matching Method Based on SVD for Image Retrieval .....	396
<i>Jie-xian Zeng, Dong-ge Bi, and Xiang Fu</i>	
A Method of Evaluating the Signal to Noise Ratio Based on Duffing Time Series .....	399
<i>Ke Lv, Jianping Xu, Dongmei Kang, and Na Zhu</i>	
A New Implement Method for Maximizing Autocorrelation in Blind Signal Separation .....	403
<i>Ming Li, Yadong Liu, and Dewen Hu</i>	
A New Method of Hybrid Color Space and Its Application .....	407
<i>Yejing Cai and Yonghong Long</i>	
A Robust Digital Watermarking Scheme and Its Application in Certificate Verification .....	410
<i>Huaqing Liang, Hongdong Yin, and Xinxin Niu</i>	
A Self-Adaptable Improved Arithmetic Based on Wavelet Transform in the Image Edge Detection .....	414
<i>Jingchao Zhang, Songyan Liu, Guangpu Hao, Lingyun Sun, and Jin Yang</i>	
A Study on Emotional Feature Analysis and Recognition in Speech Signal .....	418
<i>Xin Min Cheng, Pei Ying Cheng, and Li Zhao</i>	
An Approach for Image Thresholding Using CNN Associated with Histogram Analysis .....	421
<i>Jiayin Kang and Wenjuan Zhang</i>	
An Image Based Algorithm for Watermarking Relational Databases .....	425
<i>Zhongyan Hu, Zaihui Cao, and Jianhua Sun</i>	
Analysis and Compensation on Static Error of Accelerometer in GFSINS .....	429
<i>Yanling Hao and Zhiping Liu</i>	
Audio Steganalysis Based on Co-occurrence Matrix and PCA .....	433
<i>Yinchen Qi, Yan Wang, and Jinsha Yuan</i>	
Blind Super-Resolution Image Reconstruction Based on POCS Model .....	437
<i>Wei Xie, Feiyan Zhang, Hao Chen, and Qianqing Qin</i>	
Color Recovering Based on Dichromatic Reflection Model and Finite Dimensional Linear Model .....	441
<i>Yonghong Long, Haixia Luo, and Aichun Yi</i>	
Data Fitting by Quadratic Splines .....	445
<i>Fenghua Guo</i>	
De-noising by Self-Adaptive Lifting Algorithm Based on Modulus Maximum Analysis .....	449
<i>Wei Wang, Yingtang Zhang, and Guoquan Ren</i>	

Direction Parameter Identification of Motion-Blurred Image Based on Three Second Order Frequency Moments .....	453
<i>Yiping Wang, Xinsheng Huang, and Peng Jia</i>	

## **Session 6b: Image and Signal Processing (II)**

Elliptic Object Features Extraction and Measurement in Image Data Mining .....	461
<i>Fu Cheng You and Yong Bin Zhang</i>	
Face Tracking with Occlusion .....	465
<i>Jianxiong Tang and Jianxin Zhang</i>	
Fast Salient Object Detection Based on Segments .....	469
<i>Liansheng Zhuang, Ketan Tang, Nenghai Yu, and Yangchun Qian</i>	
Foreground Object Segmentation from Dense Multi-view Images .....	473
<i>Liangzhong Fan, Xin Yu, and Zhenyu Shu</i>	
Formation Control Numerical Simulations of Geometric Patterns for Unmanned Autonomous Vehicles with Swarm Dynamical Methodologies .....	477
<i>Zhibin Xue and Jianchao Zeng</i>	
Image Reconstruction Using an Improved MAP-EM Method in X-ray CT .....	483
<i>Baoyu Dong</i>	
Laboratory Test and Spectrum Analysis Method of Tire Noise .....	487
<i>Yong Che, Wangxin Xiao, and Lijun Chen</i>	
Medical Image Fusion Based on the Structure Similarity Match Measure .....	491
<i>Zhang-Shu Xiao and Chong-Xun Zheng</i>	
OI and fMRI Signal Separation by Maximizing Both Temporal and Spatial Structures .....	495
<i>Ming Li, Yadong Liu, and Dewen Hu</i>	
PVC Salt-Film Perforation On-Line Inspecting System Based on CCD Imaging .....	499
<i>Chenglong Gong, Yongqiang Liu, Rui Yang, Yuan Feng, and Ming Zhang</i>	
Real-Time FPGA-Based Panoramic Unrolling of High-Resolution Catadioptric Omnidirectional Images .....	502
<i>Lidong Chen, Maojun Zhang, Bin Wang, Zhihui Xiong, and Gang Cheng</i>	
Removing Shadow in Color Images Using a Combined Algorithm .....	506
<i>Zhiqiang Wei, Kang Yao, Xiaopeng Ji, and Miao Yang</i>	
Research on 3D Interactive Simulation System for Li/MnO <sub>2</sub> Coin Cell Production Line Based on Virtual Reality .....	510
<i>Xiaoming Chen and Shuzhong Lin</i>	
Research on Frequency Characteristics of Spherical-Cymbal Transducers .....	514
<i>Shilin Wu, Qi Zhang, Zhiping Huang, and Jiulong Xiong</i>	
Semi-fragile Watermarking Technique for Image Tamper Localization .....	519
<i>Hao Zhou, Haiyan Li, and Pengfei Yu</i>	

Study on Fiber Orientation of Short-Fiber-Reinforced Rubber Matrix Sealing Composites Based on Digital Image Processing .....	524
<i>Kaijun Sun, Boqin Gu, and Jianfeng Zhou</i>	
Study on Signal Processing of FMCW Ground Penetrating Radar .....	528
<i>Huaqing Liang and Zhiqiang He</i>	
Study on Ultrasonic Imaging Testing Technique of Angle Probe for Girth Weld of Hydraulic Cylinder Used in Coal Mine .....	532
<i>Yuan Chen and Hongwei Ma</i>	
The Depression of Noise in AE Signals Based on sym8 Wavelet Analysis .....	537
<i>Ning Yang, Xiao-qing Yuan, Yi-kai Shi, and Jiang-hai Zhao</i>	
The Estimation of Chaotic Signal Initial Value .....	540
<i>Huan Li and Bo Ren</i>	
The Research on Frequency-Hopping Signals Analysis Methods Based on Adaptive Optimal Kernel Time-Frequency Representation .....	544
<i>Nan Li, Shuang Dong, Dongmei Yang, and Zhonghua Hao</i>	
Three-Dimensional Medical CT Image Reconstruction .....	548
<i>Hongjian Wang</i>	
Time Frequency Neighborhood Signals De-noise Method in Ultrasonic Inspection .....	552
<i>Gaohua Liao and Dehui Liu</i>	
Time-Frequency Analysis of SAR Image Based on Generalized S-Transform .....	556
<i>Zhenming Peng, Jie Zhang, Fanmin Meng, and Jun Dai</i>	
<b>Session 7: Fault Diagnosis and Vibration Analysis</b>	
Preview Control of an Active Vehicle Suspension System Based on a Four-Degree-of-Freedom Half-Car Model .....	563
<i>Yan Li and Shaojun Liu</i>	
A New Modeling Method on Skull Defect Repair .....	568
<i>Fei You, Qingxi Hu, Yuan Yao, and Qi Lu</i>	
A Product Quality Index Derived from Product Lifetime Distribution .....	573
<i>R. Jiang</i>	
A Two Stage Feature Selection Method for Gear Fault Diagnosis Using ReliefF and GA-Wrapper .....	578
<i>Bing Li, Peilin Zhang, Guoquan Ren, and Zhi Xing</i>	
An Adaptive Active Vibration and Noise Control System with Online Secondary Path Modeling .....	582
<i>Guo Y. Jin and Hongtian Zhang</i>	
Analysis of Rotor Rubbing Fault Signal Based on Hilbert-Huang Transform .....	586
<i>Ling Xiang, Guiji Tang, and Aijun Hu</i>	
Application of Bi-cepstrum Analysis to Gear Fault Detection and Diagnosis .....	590
<i>Lihui Fu, Hui Li, and Yaning Wang</i>	

Bearing Faults Diagnosis Based on Teager Energy Operator Demodulation Technique .....	594
<i>Hui Li, Lihui Fu, and Yuping Zhang</i>	
Blind Source Separation for Convolutional Mixtures and Its Application to Machine Vibrations .....	598
<i>Weiguang Huang, Shuyou Wu, Fanrang Kong, Qiang Wu, and Peng Li</i>	
Coefficient of Variation and Its Application to Strength Prediction of Adhesively Bonded Joints .....	602
<i>Xiaocong He</i>	
Computer Simulation and Vibration Testing of Runaway Escapement .....	606
<i>Li Sui, Gengchen Shi, Ping Song, and Hongwei An</i>	
Construction of a Fault Tolerance Connected Dominating Set in Wireless Sensor Network .....	610
<i>Yongzhao Bian, Haibin Yu, and Peng Zeng</i>	
Coupled Extensional-Torsional Vibration Frequency of Hoisting Rope in Tower-Type Friction Drive Hoist System .....	615
<i>Guohua Cao, Zhencai Zhi, Weihong Peng, and Xingguo Shao</i>	
Early Fault Identification of Aircraft and Self-Recovery Monitoring of Fault .....	619
<i>Zhongsheng Wang and Shiwe Ma</i>	
EEMD-1.5 Dimension Spectrum Applied to Locomotive Gear Fault Diagnosis .....	622
<i>Lue Chen, Yanyang Zi, Wei Cheng, and Zhengjia He</i>	
Efficient Scheme for Scaleless Band Identification of Vibration Signal .....	626
<i>Bi-qiang Du, Gui-fu Deng, and Jun-jie Shi</i>	
Engineering Equipment Integrated Fault Diagnosis System Based on Component Technology .....	630
<i>Jian Wang, Jie Li, Xiangyang You, and Fang Liu</i>	
Fault Detection and Diagnosis Based on KPCA-LSSVM Model .....	634
<i>Zhonghai Li, Yan Zhang, and Liying Jiang</i>	
Fault Detection for Electro-Hydraulic Valve-Controlled Single Rod Cylinder Servo System Using Linear Robust Observer .....	639
<i>Ting-tao Ming, Yong-xiang Zhang, and Xi-yong Zhang</i>	
Fault Diagnosis Based on BFS in Electric Power System .....	643
<i>Yagang Zhang, Jinfang Zhang, Jing Ma, and Zengping Wang</i>	
Fault Diagnosis Method of Rolling Bearing Based on BP Neural Network .....	647
<i>Zhonghua Huang and Ya Xie</i>	
Fault Diagnosis of Rolling Bearing Based on Wavelet Packet Transform and Support Vector Machine .....	650
<i>Zhengyou Yang, Tao Peng, Jianbao Li, Huibin Yang, and Haiyan Jiang</i>	
Fault Diagnosis of Satellite Based on SVM Observer .....	654
<i>Shi-lei Zhao and Yin-Chun Zhang</i>	

Fault Feature Extraction Method of Time-Frequency Image Based on Fractal Dimension .....	658
<i>Zhihua Hao and LiXin Tian</i>	
Fault Line Selection in Non-solidly Earthed Network Based on Modulus Maximum Polarity .....	661
<i>Yuanyuan Zhang, Qingwu Gong, and Daojun Chen</i>	
Fault Tolerant Flight Control Law Design with a Model-Following Sliding Mode Controller .....	665
<i>Zhi-jun Yang, Xiao-hui Qi, and Gan-lin Shan</i>	
Fault-Tolerant Tension Allocation of Ship Mobile Mooring System under Sea Wind .....	669
<i>Wangqiang Niu, Xixia Huang, Wei Gu, and Jianxin Chu</i>	
Gear Fault Diagnosis Based on EMD and AR Spectrum Analysis .....	673
<i>Shufeng Ai, Hui Li, and Lihui Fu</i>	
Health Diagnosis for Aircraft Based on EMD and Neural Network .....	677
<i>Jianguo Cui, Xinqi Zheng, Ming Li, Zhonghai Li, and Dong Liu</i>	
Mechanical Fault Diagnosis Based on Local Mean Decomposition Method .....	681
<i>Baojia Chen, Xuefeng Chen, Zhengjia He, and Jiyong Tan</i>	
Parameter Optimization of Multi-mode Vibration Control System .....	685
<i>Xiaobing Luo, Rujian Ma, Guixi Li, and Dong Zhao</i>	
Research on Data Fusion Fault Diagnosis Method Based on D-S Evidence Theory .....	689
<i>Shengqiang Wu and Wanlu Jiang</i>	
Research on Detecting Technology of Rotating Blade Vibration Performance Parameters .....	693
<i>Fajie Duan, Tao Ouyang, and Menglin Li</i>	
Research on Fault Diagnosis of Fork Lift Truck Hydraulic System Based on Artificial Neural Network .....	697
<i>Heqing Li and Qing Tan</i>	
Research on Fault Diagnosis of Turbine Based on Similarity Measures between Interval-Valued Intuitionistic Fuzzy Sets .....	700
<i>Weibo Lee, HongWei Shen, and Guoyun Zhang</i>	
Research on Real-Time Distinguishing Technology of Abnormal Vibration Source in High Building .....	704
<i>Gewei Chen, Jue Dai, and Handong Wang</i>	
Research on Rub Impact Fault Diagnosis Method of Rotating Machinery Based on Wavelet Packet and Support Vector Machine .....	707
<i>Yanjun Lu, Fanlong Meng, and Yibo Li</i>	
Research on the Gear Fault Diagnosis Using Order Envelope Spectrum .....	711
<i>Hui Li, Lihui Fu, and Zhenjiang Shi</i>	

Research on Vehicle-Coupled-Guideway Vibration in Hybrid Maglev System .....	715
<i>Hu Cheng, Shuwen Chen, and Yungang Li</i>	
Study on Engine Vibration Signal Denoising Method of SURE Block Threshold Based on DT-CWPT .....	719
<i>Dinghai Wu, Peilin Zhang, Guoquan Ren, Bing Li, and Jianjun Cao</i>	
Study on Fault Diagnosis of Gear with Spall Using Ferrography and Vibration Analysis .....	723
<i>Wei Feng, Xiaopeng Xie, and Yibo Cao</i>	
Study on Relationship between Sound Wave and Temperature of Fault Diagnose of Liquid Transmission System .....	728
<i>Dapeng Zou, Baihai Wu, Tibing Xiao, and Jianjun Long</i>	
Study on Torsional Vibration Performance of Twist Drill in Axial Vibration Drilling .....	732
<i>L. J. Ma, X. B. Wang, G. J. Liu, X. Q. Chen, and J. X. Du</i>	
The Fault Diagnosis of Machine Based on Modal Analysis .....	738
<i>Liguo Zhang, Yutian Wang, Sheng Zhang, and Guangpu Hao</i>	
<b>Session 8: Control Theory and Simulation</b>	
A Comparative Analysis to Traditional PID and Fuzzy Adaptive PI-Variable Damping Controlling System of MRST Stabilized Platform .....	745
<i>Duan Zheng Yong and Peng Yong</i>	
A Novel PID Controller Based on Immune Networks Model Utilizing Vector Distance .....	749
<i>Meng-gang Sheng and Hui-xian Huang</i>	
A Robust Controller Design for Electric Power Steering System Based on PI Current Loop .....	753
<i>Qiang Li, De-yu Song, Feng Cheng, Li-kang Yang, and Ren-hua Cai</i>	
A Pan-Tilt Camera Control System of Subminiature Robot Helicopter Visual Landing Based on Biomimetic Eye .....	757
<i>Hengyu Li, Jun Luo, Shaorong Xie, Tao Wang, and Rui Liu</i>	
A Semiglobally Stable PD-I(PD) Regulator for Robot Manipulators .....	763
<i>Bai-shun Liu and Fan-Cai Lin</i>	
Active Fuzzy Control for Magnetic Suspended Floating Raft Isolation System .....	767
<i>Weiwei Zhang, Chunsheng Song, and Yefa Hu</i>	
Adaptive Fuzzy PID Control for Switched Reluctance Motor Direct Drive Servo Hydraulic Press .....	771
<i>Jian-ming Zheng, Sheng-dun Zhao, and Shu-guo Wei</i>	
Application of Cascade Control System for Density Adjustment of Starch Production-Line .....	775
<i>Gang Shen, Jing-feng He, Peter Ogbobe, Jun-wei Han, Kai Zhao, and En-yong Xu</i>	

Bifurcation Dynamics of a Worm Model with Impulsive Control .....	779
<i>Tao Li, Yuanmei Wang, Guangyue Lu, and Yalin Xiang</i>	
Control Method of the Spring Back in Bending Micro and Precise Stamping Parts .....	782
<i>Zhen-yuan Huang, Han Zhang, and Feng Ruan</i>	
Cost Control Strategy of Shipping Enterprises under Asymmetric Information .....	785
<i>Shuyong Liu, Yan Chen, Hongyu Jia, and Fei Chen</i>	
Delay-Dependent Output Feedback Passive Control for Time-Delayed System .....	789
<i>Gui-Fang Li and Sheng-guo Huang</i>	
Design Theory for Speed Control by Using Increasing Edge Rate .....	794
<i>Shun-ying Zhu, Qin-mei Sun, and Hong Wang</i>	
Influence of Sheet Material Characteristics on the Torsional Free Vibration of Single Lap-Jointed Cantilevered SPR Joints .....	800
<i>Xiaocong He</i>	
Integrated Structure and Control Parameters Optimization for an Automotive Active Suspension System via LMIs .....	804
<i>Yi Zhang, Zifan Fang, and Gang Wu</i>	
Minimal Ventilation Velocity to Control Smoke in Subway Fire .....	808
<i>Wen-Zhong Wu and Shi-Jun You</i>	
Model-Based Control Scheme for Networked Multi-rate Sampling Systems .....	812
<i>Jin Jin, Zhiwen Wang, and Dongsong Luo</i>	
Online Detection and Control System for Auto Body Welding Fixture .....	816
<i>Jialiang Zhang, Jianguo Yang, and Beizhi Li</i>	
On Synchronism Control Strategy of Large-Scale Water Press Based on Structure Invariance Principle .....	820
<i>Yucai Zhou, ShaoJun Liu, Minghui Huang, Min Chen, and Lihua Zhan</i>	
Operation Mode of Canal System Based on Water Volume Control Method .....	823
<i>Zhiliang Ding, Changde Wang, Guangming Tan, and Xiong Yao</i>	
Optimization of the Giant Hydraulic Press's Synchronism-Balancing Control System .....	828
<i>ZhongWei Liu, ShaoJun Liu, Minghui Huang, Yucai Zhou, and YingJian Deng</i>	
PD-I(PD)-Type ILC for a Class of Nonlinear Systems .....	832
<i>Bai-shun Liu and Ying-Ze Hao</i>	
Predictive Control for Varying Sampling Period System in NCS .....	836
<i>Bicheng Lei, Jinbiao Chen, and Shiqinq Zhang</i>	
Research of Driving Control System of a Felling and Bunching Robot .....	841
<i>Huaimin Lu, Xiuli Guo, Xiurong Guo, and Zhiqiang Zhao</i>	
Research of Operation Method of Automation Control Model in a Single Ice-Covered Canal .....	845
<i>Mengkai Liu, Changde Wang, and Xiaobo Feng</i>	

Research on Adaptive Control Modeling of a Manure Spreader for Precision Agriculture .....	850
<i>Zidong Yang and Ruicheng Du</i>	
Robust Adaptive Control for Manipulator System .....	855
<i>Xiaobo Sun</i>	
Robust Compensation Control of Mobile Manipulator Service Robot .....	860
<i>Chi-wu Bu and Li-xun Zhang</i>	
Robust Control for Uncertain Nonlinear Systems with Time Delays .....	865
<i>Xingmin Ji</i>	
Robust Fault-Tolerant Control for Networked Control System Based on Takagi-Sugeno Fuzzy Model .....	868
<i>Wei Li, Dongnian Jiang, and Weirong Liu</i>	
Robust Stability for a Class of Nonlinear Neutral System with Norm-Bounded Uncertainties .....	874
<i>Diankun Wang and Li Zhang</i>	
Safety Index of High-Speed Maglev Train Decentralized Operation Control System .....	878
<i>Peng Zhou, Hongze Xu, and Jianjun Hou</i>	
Structural Active Control Based on the Concept of Equivalent-Input-Disturbance Considering Actuator Saturation .....	882
<i>Ming-Xing Fang, Min Wu, and Jin-Hua She</i>	
Study on Hoisting Speed Control for the 7500T Full Revolving Floating Crane .....	886
<i>Yijian Liu and Shilong Xue</i>	
Study on Slewing Control System for the 7500T Full Revolving Floating Crane .....	890
<i>Shilong Xue and Yijian Liu</i>	
Study on Software and Hardware Control of High-Precision Measurement Platform for Optical Aspheric Surface .....	894
<i>Xiaolong Ke, Yinbiao Guo, and Longxing Guo</i>	
The Analysis and Design of Steel Plant Electrostatic Precipitator Control System Based on IFIX .....	898
<i>Kaixing Wu and Yuqing Zheng</i>	
The Fuel Control System and Performance Optimization of a Spark-Ignition LPG Engine .....	901
<i>Hongwei Cui</i>	
The Research of Double-Driven Electric Vehicle Stability Control System .....	905
<i>Junwei Li and Huafang Yang</i>	
The Variable Frequency and Speed Regulation Constant Pressure Water Supply System Based on PLC and Fuzzy Control .....	910
<i>Xiaohong Peng, Laisheng Xiao, Zhi Mo, and Guodong Liu</i>	



Thrust Dynamic Decoupling Control Based on Disturbance Observer for a Novel Planar Magnetic Suspension Stage .....	914
<i>Zhenxiong Zhou, Jiandong Yang, Yongyin Qu, and Dejun Liu</i>	
Trajectory Control Strategies for the Underwater Glider .....	918
<i>Yanhui Wang, Hongwei Zhang, and Shuxin Wang</i>	
Vehicle Stability Control Strategy Based on Active Torque Distribution and Differential Braking .....	922
<i>Siqi Zhang, Tianxia Zhang, and Shuwen Zhou</i>	
Vibration Controller of Marine Electromagnetic Vibrator .....	926
<i>Feng Sun, Zu Bin Chen, and Jun Lin</i>	

## **Author Index - Volume 1**

# **2009 International Conference on Measuring Technology and Mechatronics Automation**

**(ICMTMA 2009)**

**Zhangjiajie, China  
11 – 12 April 2009**

**Volume 2  
Pages 1-464**



**IEEE Catalog Number: CFP0913G-PRT  
ISBN: 978-1-4244-3657-6**

# 2009 International Conference on Measuring Technology and Mechatronics Automation

---

## ICMTMA 2009

# Table of Contents

## Volume - 2

---

### Session 9: Manufacturing Automation

A Framework for Supporting Business, Data and User Interface Integration between Multiple CAD and PDM Systems .....	3
<i>Jin Zhang, Hongqiao Zhou, Zhuoning Chen, and Xiaoguang Yan</i>	
A Method for Path Planning of Hydraulic Manipulator .....	8
<i>Zheng Yang, Jianzhong Shang, Nan Cong, Li Tang, Keshan Liang, Biao Wang, and Mingkang Gou</i>	
A Method to Derive Moment Invariants .....	13
<i>Yuanbin Wang, Bin Zhang, and Tianshun Yao</i>	
Synchronism Control System of Heavy Hydraulic Press .....	17
<i>Min Chen, Minghui Huang, Yucai Zhou, and Lihua Zhan</i>	
A New Type of Contact Shape Meter and Its Industry Application .....	20
<i>Bingqiang Yu, Hongmin Liu, Lipo Yang, Yan Peng, and Zhiming Li</i>	
A Novel Strategy for Distributed Multi-robot Coordination in Area Exploration .....	24
<i>Jie Zhao, Xiangguo Su, and Jihong Yan</i>	
A Study on Quick Cockpit for Flight Simulators Prototype Systems .....	28
<i>Guangda Liu, Qitao Huang, Bing Zhang, Junwei Han, and En-yong Xu</i>	

A Study on the Application and Construction Technology of Hard Asphalt Mixture .....	32
<i>Sheng Li and Ren-jie Qin</i>	
A Tensioner System for a Deepwater Pipelaying Vessel .....	36
<i>Junliang Zhang, Li Lin, and Shimin Zhang</i>	
Application and Design of Real-Time Control System for the Quad-rotor Helicopter .....	40
<i>Xiaojie Liu, Xiaohui Zhao, Haijun Gu, and Anand Sanchez</i>	
Design and Fabrication of a Novel PZT Films Based Piezoelectric Micromachined Ultrasonic Transducers .....	45
<i>Junhong Li, Chenghao Wang, and Mengwei Liu</i>	
Design of Control System for Wind Turbine Electric Pitch .....	50
<i>Yongwei Li, Shuxia Liu, Jiazhong Wang, Hongbo Zhang, and Zhiping Lu</i>	
Detection of Microbes in Natural Industrial Cooling Water by Conductometric method .....	54
<i>Hong Men, Shengwei Mu, Yan Peng, and Lingfei An</i>	
Digital Holography Used for Shape Measurement of Microscopic Object .....	58
<i>Jingbo Liu, Xiufa Song, Min Huang, and Huaying Wang</i>	
Dynamic Analysis and Force Calculation of Seafloor Mining Tool Based on the Heave Motion of Mining Support Vessel in the Launching Process .....	62
<i>Xiaozhou Hu, Shaojun Liu, Bin Du, and Yu Dai</i>	
Dynamics Characteristics of Air Propeller-Gear Reducer Propulsion Device Based on Virtual Prototype .....	67
<i>Rui-guang Geng, Wan-you Li, and Hong-tian Zhang</i>	
Dynamics Response Characteristic of Moving Beam's Displacement for 300 MN Die Forging Hydraulic Press .....	72
<i>Changzheng Huang, Jianping Tan, and Jianxin Yang</i>	
Imbalance Identification of an Over-Hung Rotor Based on the Accelerating Response Data .....	76
<i>J. P. Huang and X. M. Ren</i>	
Injection Process Analysis and Mold Manufacturing for Telephone Cover .....	80
<i>Weihua Kuang and Zikai Xue</i>	
Local Path Planning of Mobile Robots in Dynamic Unknown Environment Based on Prediction of Collision .....	84
<i>Yang Gao and Shu-dong Shun</i>	
Manufacturing, Mathematic Models and Meshing Analysis for the Cycloid Grooves of the Cycloid Ball Planetary Drive .....	89
<i>Zuomei Yang, Zijun An, and Peng Zhang</i>	
Microstructure Evolution of Stainless Steel during Laser Metal Deposition Shaping .....	93
<i>Kai Zhang and Weijun Liu</i>	

Nonlinear Characteristics of Rub-Impact Rotor-Bearing System with Slowly Varying Mass .....	97
<i>Yuegang Luo, Yuanhu Du, Zhaohui Ren, and Bangchun Wen</i>	
Nonlinear Dynamic Behaviors of Single Disk Symmetrical Flexible Rotor-Bearing System .....	101
<i>Rong Dai, Yongfang Zhang, Yanjun Lu, and Di Hei</i>	
Research on Virtual NC Technique in High Precision Grinding Process .....	106
<i>Zhigang Jia, Yinbiao Guo, Chen Jiang, and Zhenzhong Wang</i>	
Research on Vortex Unstability Caused by Bending Deformation of Drilling Bar in BTA Deep Hole Machining .....	110
<i>Zhanqi Hu and Wu Zhao</i>	
Resonance Characteristic Analysis for Spur Gear Servo Mechanism .....	114
<i>Zirong Luo, Dapeng Fan, Jianzhong Shang, Shaoshuai Miao, Zheng Yang, and Xiaoming Wang</i>	
Stability and Bifurcation of Flexible Rotor System with Hydrodynamic Bearing Supports .....	119
<i>Yongfang Zhang, Yanjun Lu, and Rong Dai</i>	
Stabilization of a Class of Switched Systems with Mismatched Switching .....	124
<i>Weiming Xiang, Mingxia Che, Chenyong Xiao, and Zhengrong Xiang</i>	
Structural Parameter Identification for Articulated Arm Coordinate Measuring Machines .....	128
<i>Guanbin Gao, Wen Wang, Keng Lin, and Zichen Chen</i>	
Study on Assist Coefficient and Disturbance Resistance for EPS .....	132
<i>Jianwei Wei and Minxiang Wei</i>	
Study on Dynamical Characteristics of Spindle System of CNC Machine Based on Experimental Mode Analysis .....	136
<i>Licheng Yang, Jingxiang Hu, Caijie Wei, and Liwei Ning</i>	
Study on the Turntable Hydraulic Variable Structure Control Based on Lyapunov Theory .....	140
<i>Tian-hua Chen, Pei-yuan Guo, Zai-wen Liu, and Kun-Peng Wang</i>	
Surface Matching Method for the Armed Inspection Robots .....	144
<i>Yuqing Chen, Ying Hu, and Zi Ma</i>	
The Dynamics of Open Loop Flexible Robots System Base on Efficient Recursive Method .....	148
<i>Fuyang Tian, Hongtao Wu, and Hongli Sun</i>	
The Positioning of Binocular Stereo Visual Servoing Based on Robot Dynamics .....	152
<i>Mei Jin, Liguozhang, and Huiguang Li</i>	
The Research of ABS Performance Examination Experiment Based on Virtual Technique .....	156
<i>Jing-ming Zhang, Bao-yu Song, Da-fang Wang, and Sheng-min Cui</i>	

The Scheme Design and Application of Large Gap Magnetic Drive System Which Is Driven by Traveling Wave Magnetic Field .....	160
<i>Jianping Tan, Yan Xu, Tanxi Li, and Yunlong Liu</i>	
The Stability Analysis of Hydrodynamic Journal Bearings Allowing for Manufacturing Tolerances. Part I: Effect Analysis of Manufacturing Tolerances by Taguchi Method .....	164
<i>Wubin Xu, Peter J. Ogrodnik, Mike J. Goodwin, and Gordon A. Bancroft</i>	
The Stability Analysis of Hydrodynamic Journal Bearings Allowing for Manufacturing Tolerances. Part II: Stability Analysis Model with Consideration of Tolerances .....	168
<i>Peter J. Ogrodnik, Mike J. Goodwin, Gordon A. Bancroft, and Wubin Xu</i>	
<b>Session 10a: System Modeling and Simulation (I)</b>	
A Method to Enhance SCADA Systems Survivability through Simulation Technology .....	175
<i>Feng Li, Limin Shen, Yali Si, and JingChun Niu</i>	
A Methodology for Rapid Assembly Modeling of Components with Typical Assembly Feature .....	179
<i>Gui-dong Li, Lai-shui Zhou, Lu-ling An, Zhi-guo Wang, Jun-feng Ji, and Chang-bai Tan</i>	
A Simulation Model for Transit Service Unreliability Prevention Based on AVL-APC Data .....	184
<i>Wei-Ya Chen and Zhi-Ya Chen</i>	
A Simulation of the Four-Wheel Steering Vehicle Stability Based on DYC Control .....	189
<i>Li Zhou, Linli Ou, and Cui Wang</i>	
A Simulation of Vehicle Lateral Stability Based on Fuzzy PID Control .....	194
<i>Yihu Wu, Cui Wang, Li Zhou, and Linli Ou</i>	
A Simulation-Based Research on Emergency Pedestrian Evacuation for Urban Residential Districts .....	200
<i>Shuang Li, Wei Deng, and Yisheng Lv</i>	
Chatter Stability Limits Simulation and Experimental Research on Medium and Low Speed Peripheral Milling .....	204
<i>Zhongqun Li</i>	
Dynamic Simulation of Clutch Robot Leg of Robot Driver Based on ADAMS .....	208
<i>Zhigang Niu, Yonghui Ma, and Lili Wang</i>	
Dynamic Simulation of Vehicle Floating Bridge System Based on ADAMS .....	212
<i>Yu-huai Hou, Fang-zhen Song, and Ru-jian Ma</i>	
Dynamical Behavior and Parameter Optimization of a Vibratory System .....	217
<i>Yanlong Zhang and Li Wang</i>	

Dynamics Simulation on Installation Angle of Mast Link Frame System of Rotary Drilling Rig .....	221
<i>Huimei Kang, Qinghua He, and Jianxin Zhu</i>	
Eccentric LRPIM for Convection Dominated Problems .....	226
<i>Zujun Zhang, Feng Ruan, Saijun Zhang, and Zhenjiao Chen</i>	
Flight Simulator Architecture Development and Implementation .....	230
<i>Shutao Zheng, Qitao Huang, Jun Jin, and Junwei Han</i>	
Hierarchical Simultaneous Localization and Mapping Based on Discrete Event Systems .....	234
<i>Xufeng Dai and Juan Du</i>	
High Speed Real-Time Foreign Recognition Based on Hypersphere One-Class Support .....	238
<i>Fu-guang Yao and Xian-xin Zhong</i>	
Investigation to Simulation of Regenerative Braking for Parallel Hydraulic Hybrid Vehicles .....	242
<i>Tao Liu, Jihai Jiang, and Hui Sun</i>	
Modeling and Optimum Design of Pneumatic Gear Motor .....	246
<i>Minglian Zhou and Jian Wen</i>	
Modeling and Simulation of Multi-legged Walking Machine Prototype .....	251
<i>Gang Wang, Lixun Zhang, Dongliang Chen, Defeng Liu, and Xi Chen</i>	
Modeling and Simulation on Left-Turn Waiting Area at Isolated Signalized Intersection .....	255
<i>Liping Gao, Baohua Mao, Mingjun Liu, Shaokuan Chen, and Xiaojie Zhang</i>	
Multi-stage Quality Modeling and Analyzing Based on AHP and PLS .....	259
<i>Chen Bing, Feng Tao, Yang Ting, and Wang Gang</i>	
Numerical Simulation and Testing Analysis of Adaptive Heave Motion Measurements .....	263
<i>Wenlin Yang, Sufen Wei, Zhuying Zhang, and Aiqun Zhang</i>	
Numerical Simulation of Fluid Flow in Thin Slab Continuous Casting Mould .....	267
<i>Jing Zhang, Ying Gao, Jingna Gao, Ge Wang, Lingjun An, and Qiang Li</i>	
Numerical Simulation of Jet Flow Led by Different Central Body Locations .....	271
<i>Haixia Liu, Can Kang, and Minguan Yang</i>	
Numerical Simulation of Temperature on Copper Mould of Thin Slab Continuous Casting .....	275
<i>Youyin Sun, Ge Wang, Jingna Gao, Ying Gao, Lingjun An, and Qiang Li</i>	
Numerical Simulation on Solidification and Heat-Transfer of Continuous Casting of Thin Slab .....	279
<i>Jingna Gao, Ying Gao, Ge Wang, Lingjun An, and Qiang Li</i>	
Offline Kinematics Simulation of 6-DOF Welding Robot .....	283
<i>Guojun Wen, Linhong Xu, and Fulun He</i>	

Pre-stretching Simulation and Residual Stresses Measurement in Aluminum Alloy Thick Plates .....	287
<i>Kai Liao, Yun-xin Wu, and Hai Gong</i>	
Processing Information Extracting and Machining Process Simulation of the Revolving Model Parts .....	292
<i>Ting-ting Liu, Shu-lin Hou, Yi-dong Tao, and Ye Kong</i>	
Research on Highway Emergency Vehicle Dispatching Model .....	296
<i>Han-tao Zhao, Jun-qiang Leng, and Guo-sheng Ma</i>	
Research on Physical Simulation of Virtual NC Manufacture Process Based on ALGOR .....	300
<i>Xiu Lin Sui, Xiao Ping Yang, Jia Tai Zhang, and Zheng Wei Kong</i>	
Research on Scheduling and Simulation of Production for the Mixed Model General Automotive Assembly Process .....	304
<i>Zhenxin Cao and Shiping Ma</i>	
Research on Structural Performance Simulation of Heavy Duty Freight Car Based on Virtual Prototyping Technology .....	308
<i>Siqun Ma and Wenzhong Zhao</i>	
Research on Three Dimensional Modeling and Track Parameters of WEDM of Closed Interface on the Ring with High Precision .....	312
<i>Jingxiang Hu, Licheng Yang, Jiahong Yu, and Dingqing Zhong</i>	
Risk Assessment Model of Automobile Defect Based on Gray Theory .....	317
<i>Yan Wang, Yun-Song Wang, and Jin-Huan Zhang</i>	
Risk Evaluation Process Model of Information Security .....	321
<i>Jing Liu</i>	

### **Session 10b: System Modeling and Simulation (II)**

Simulation and Analysis of the Cabin Typical Structure under Vibro-acoustic Combined Environment .....	327
<i>Jun Wang, Wei Ning, and Jinghui Zhang</i>	
Simulation and Evaluation of the Combat Effectiveness of Television Remote Control Missile .....	331
<i>Yongfang Zhang, Yanjun Lu, Xiaolei Shi, and An Zhang</i>	
Simulation and Experimental Study of a Model Offshore Platform .....	335
<i>Yantao An, Rujian Ma, Meihua Dong, and Haiting Zhang</i>	
Simulation Design and Application of Music Playing Robot Based on SolidWorks .....	339
<i>Tingjun Wang, Shenshun Hu, Jun Xu, Dewei Yan, and Jiawen Bi</i>	
Simulation of PMSM Vector Control System Based on Matlab/Simulink .....	343
<i>Ting-ting Liu, Yu Tan, Gang Wu, and Shu-mao Wang</i>	



Simulation on Automobile Handling and Stability Based on Combination Control .....	347
<i>Lixia Zhang, Fuquan Pan, and Fengyuan Wang</i>	
Simulation on Improving Imaging Resolution of SAFT .....	351
<i>Qiufeng Li, Xinhong Jin, Min Zhao, Lihua Shi, and Zhixue Shao</i>	
Simulation on Steering Stability of 4WS Tractor Semi-trailer .....	355
<i>Sheng Chang, Hong-guo Xu, and Hong-fei Liu</i>	
Simulation Research of a Synchronous Balancing System for Hydraulic Press Based on AME/Simulink .....	359
<i>Jiangtao Tu and Minghui Huang</i>	
Simulation Research on Influence of Velocity Discreteness on Venture Degree of Vehicle Rear-End Accidents .....	363
<i>Yihu Wu, Dan Yu, and Jixiang Xie</i>	
Simulation Study of CVT Ratio Control for Engine Braking .....	367
<i>Naiwei Zou, Qingnian Wang, Wei Wang, and Xiaohua Zeng</i>	
Simulation-Based Predictive Control for Discrete Production System State .....	371
<i>Guo-dong Wang, Ren-zhong Tang, Zhi-guo Wang, and Yi Xie</i>	
State and Parameter Estimation of a HEV Li-ion Battery Pack Using Adaptive Kalman Filter with a New SOC-OCV Concept .....	375
<i>Haifeng Dai, Xuezhe Wei, and Zechang Sun</i>	
Study on Bus Passenger Capacity Forecast Based on Regression Analysis including Time Series .....	381
<i>Wen-xia Sun, Ti Song, and Hai Zhong</i>	
Study on Temperature Field and Thermal Deformation of Roll Sleeve in Twin-Roll Strip Casting .....	385
<i>Zheng Chang and Guangming Zhu</i>	
Study on the Evaluating Models of Energy Consumption in Clinker Cooler Conveying .....	389
<i>Yan Wen and Wenming Zhang</i>	
Study on the Method of Sector Division Based on the Power Diagram .....	393
<i>Fu-qing Dai, Zheng Li, and Li-li Wang</i>	
Subway Station Evacuation Simulation System .....	396
<i>Baoqian Dai, Tong Wang, and Yueping Qin</i>	
The Application of Simulation Technique on Gearbox Design .....	400
<i>Kongde He, Zifan Fang, Dalin Zhu, Chaoxue Huang, and Xingman Yang</i>	
The Numerical Simulation in Deep-Drawing Process of Conical Work Piece .....	404
<i>Xiao-juan Lin and Zuo-cheng Wang</i>	
The Prediction Tracking Method of Weak Aerial Target Based on GM (1,1) Model .....	408
<i>Zhonghai Li, Li Wang, Jianguo Cui, Desheng Song, and Changjun Xu</i>	

The Research on Airport Ground Capacity Evaluation Based on 3-Dimensional Airport TWR Simulation System .....	412
<i>Nan Li and Lin Wang</i>	
The Study on Data Warehouse Modelling and OLAP for Highway Management .....	416
<i>Qian Zhou and Qing Xiao</i>	
Three-Dimensional Motion Simulation of Robot Driver .....	420
<i>Zhigang Niu and Lili Wang</i>	
Trajectory Planning and Simulation of a New Symmetric Parallel Mechanism with Three Translational DOF .....	424
<i>Xiuqing Hao and Lei Sun</i>	
Virtual Simulation Analysis and Experiment Study on a New Peel Scratch Relieving Design of Sugarcane Leaf Cleaning Device .....	428
<i>Xiao Lai, Shi Liang, Dong-mei Liu, Dong-Wei Ji, Shang-ping Li, and Zhi-Wen Qin</i>	
Virtual Simulation Machining on Spiral Bevel Gear with New Type Spiral Bevel Gear Milling Machine .....	432
<i>Yanwei Xu, Lianhong Zhang, Wei Wei, and Leping Wang</i>	
Vision-Based Moving Objects Detection with Background Modeling .....	436
<i>Hongyu Hu, Zhihui Li, Zhaowei Qu, and Dianhai Wang</i>	

## **Session 11: Rough Set and Data Mining**

A Coupling Model of Electric Power Grid Based on Rough Sets and Radical Basis Function .....	443
<i>Xiaoquan Li, Jie Wang, and Peiyuan Cheng</i>	
A Data Acquisition and 2-D Flow Measuring Technology in Agricultural Spray Field Based on High Speed Image Processing .....	446
<i>Jun Lu and Pingping Li</i>	
A Geographic Information Knowledge Discovery Model Based on Rough Set and Neural Network .....	450
<i>Yannan Sun and Xiumei Li</i>	
Research on Data Processing for Weight-in-Motion of Vehicles .....	454
<i>LanYing Guo, Bo Liang, and Anguo Dong</i>	
Research on the Configuration of Reconfigurable Machine Tool Using Rough Set .....	457
<i>Nan Xie, Aiping Li, Jianxin You, and Siying Chen</i>	
Study on the Traffic Flow Guidance Model of Expressway Based on Data Fusion .....	461
<i>Di Wu and Yan Shen</i>	

## Session 12: Intelligent System Design

A Neural Network Blind Multi-user Detection Algorithm .....	467
<i>He Li</i>	
A Novel Particle Swarm Optimization Method Using Clonal Selection Algorithm .....	471
<i>Lu Hong</i>	
A Novel Strategy for Visual Tracking and Visual Information Extraction .....	475
<i>Zhiyuan Liu, Bingbing Lee, Kai Lee, Jing Jiang, Meng Lee, and Jiejun Qiu</i>	
A PSO-Based Ball-Plate Calibration for Laser Scanner .....	479
<i>Qiang Zhao, Yongheng Yue, and Qiang Guan</i>	
A Pursuit-Evasion Algorithm Based on Hierarchical Reinforcement Learning .....	482
<i>Jie Liu, Shuhua Liu, Hongyan Wu, and Yu Zhang</i>	
An Integrated Methodology for Workpiece-Fixture System Stiffness Calculation and Error Control .....	487
<i>Fa-ping Zhang, Ji-ping Lu, Yan Yan, Hou-fang Sun, and Shahid I. Butt</i>	
Bionic Self-Learning of Two-Wheeled Robot Based on Skinner's Operant Conditioning .....	491
<i>Hong-ge Ren, Xiao-gang Ruan, and Xin-yuan Li</i>	
Design of Adaptive Disturbance Controller for Heavy-Duty Lifting Pipe Heave Compensation System .....	495
<i>Tibing Xiao, Yuming Zhou, Jianjun Long, Dapeng Zou, and Baihai Wu</i>	
Human Factor Analysis on Marine Accidents Based on Attribute Reduction .....	499
<i>Bin Zheng, Shaosheng Xia, Jinbiao Chen, and Yongxing Jin</i>	
Intelligent Coordinate Control of Pneumatic Pressure Signal Generator of Airplane Engine Inlet Test System Based on Fuzzy Neural Network .....	503
<i>Xiao Li and Jinshan Tang</i>	
Safety Requirements Parameter Derivation for Maglev Train Propulsion and Protection Systems Based on Stochastic Petri Nets .....	507
<i>Wei Zheng and Hongze Xu</i>	
Study and Practice of Highway Network Toll to Anti-defraud of Vehicle That Exchanged the IC Card and Nested the Plate .....	511
<i>Zhijun Huang and Chuangwen Xia</i>	
The Parameter Optimization of Human-Simulated Intelligent Controller Based on Improved Genetic Algorithm .....	515
<i>Guiqiang Chen, Linjian Tang, and Yan Tang</i>	
Variable Structure GA Based Motion Planning of a Three-Limbed Robot .....	519
<i>Ming Pang, ZhiYuan Liu, ShouChen Cai, Zongwei Ren, and Yanhe Zhu</i>	
VB-Based Communications and Optimization Design in Beer Fermentation Control System .....	523
<i>Yihu Huang, Genmin Zhang, and Jinli Wang</i>	

## Session 13: Fuzzy Systems and Applications

A Kernel Fuzzy Clustering Algorithm with Spatial Constraint Based on Improved Expectation Maximization for Image Segmentation .....	529
<i>Xuchao Li and Suxuan Bian</i>	
A Robust AQM Algorithm Based on Fuzzy-Inference .....	534
<i>Chuan Zhou and Xuejiao Li</i>	
Analysis and Control for a Class of Uncertain Switched Fuzzy Systems .....	538
<i>Jianmei Jiang, Yuequan Yang, Jinhua Zhang, and Kun Huang</i>	
Analysis of Heating Furnace Temperature Control System Based on Expert Fuzzy Control .....	542
<i>Zenghuan Liu, Likong Li, Lu Wen, and Guangxiang He</i>	
Application of Fuzzy Programming with Recourse in Material Requirement Planning Problem .....	546
<i>Tao Li, Peng Lin, Gao-Ji Sun, and Hai-Hong Liu</i>	
Application of H-Fuzzy Evaluation Model in Traffic Congestion Degree of City Road-Network .....	550
<i>Qi-liang Ren and Qi-yuan Peng</i>	
Evaluation on Safety Performance of Air Traffic Management Based on Fuzzy Theory .....	554
<i>Run-tu Nie, Yong Zhao, and Jie-hui Dai</i>	
Exploiting Multi-sensors for a Fuzzy Controller in the Photo Bioreactor .....	558
<i>Tao Chi and Xu-xiong Huang</i>	
Fuzzy Control for Regulating Level of Pressure Support Ventilation .....	562
<i>Weiwei Yi, Qi Zhang, Yueke Wang, Jiulong Xiong, and Haiyan Qin</i>	
Fuzzy Modeling Method and Device for Distributed Generation System .....	566
<i>Qiuye Sun, Chonghui Song, Huaguang Zhang, and Yan Zhao</i>	
Fuzzy Self-Adaptive PID Controller for Freeway Ramp Metering .....	570
<i>Tao Jiang and Xinrong Liang</i>	
Research on Supply-Chain-Based Logistics Service Capability by Combination Weighting Method and Fuzzy VIKOR Algorithm .....	574
<i>Yuansheng Huang, Ying Yan, and ZhiWen Qiu</i>	
Research on the Fuzzy Control and Simulation for Intersection Based on the Phase Sequence Optimization .....	578
<i>Junqiang Leng and Yuqin Feng</i>	
Research on Traffic Mode of Elevator Applied Fuzzy C-Mean Clustering Algorithm Based on PSO .....	582
<i>Hai-yan Tang, Bao Ding, and Wei-gui Qi</i>	
Robust Guaranteed Cost Control Base on T-S Fuzzy Model .....	586
<i>Dejia Shi and Weijin Jiang</i>	

Semi-active Fuzzy Control for Vibration Isolation System with Magnetic Suspension Isolator .....	590
<i>Chunsheng Song, Yefa Hu, and Zude Zhou</i>	
Sensor-Less Jam Fault Detection of Electro-hydraulic Executive Device under Interval-Valued Intuitionistic Fuzzy Circumstance .....	594
<i>Weibo Lee and HongWei Shen</i>	
Study on Fuzzy Control Algorithm for Magnetic Levitated Platform .....	598
<i>Huachun Wu and Yefa Hu</i>	
The Application of Fuzzy Control in Strategic Decision-Making of Small and Medium Enterprises .....	602
<i>Zhengyuan Jia, Lihua Gong, and Jia Han</i>	
The Fuzzy-PI Control of Switched Reluctance Motor Based on DTC .....	606
<i>Mianhua Wang</i>	
Two-Stage Fuzzy Logic Controller Based on Adjustable Phase Sequence for Urban Traffic Intersection .....	610
<i>Xiaohong Peng, Laisheng Xiao, Zhi Mo, and Guodong Liu</i>	
<b>Session 14: Electric Automation</b>	
A Novel Over Modulation Strategy for Two-Stage Matrix Converter .....	617
<i>Zhiyong Li, Xiangdong Kong, and Xiaoying Li</i>	
Biomimetic Electronic Tongue for Classification of Mineral Water .....	621
<i>Hong Men, Zongnian Ge, Yuming Guo, Lingfei An, and Yan Peng</i>	
Broken Rotor Bar Detection in Induction Motors via Wavelet Ridge .....	625
<i>Yunbing Wei, Baoshan Shi, Guangzhao Cui, and Jun Yin</i>	
Decoupling Strategy Analysis of Winder's Tension Control System .....	629
<i>Feng Ru, Jinfu Wu, and Xiaosong Gao</i>	
Inverse System Decoupling Control for Induction Motor Based on Neural Network On-Line Learning .....	632
<i>Wei Ni and Yu Zhang</i>	
Low Power Strategy Design for Battery Management System .....	636
<i>Yuheng Li, Xuezhe Wei, and Zechang Sun</i>	
Measuring Method of Harmonics in Power System Based on Wavelet Neural Network .....	640
<i>Zhen Wang and Yi-hua Li</i>	
Model Analysis and Performance Assessment of Electrical Motorcycles .....	644
<i>P. S. Pa and S. C. Chang</i>	
Motor Fault Diagnosis Based on Wavelet Energy and Immune Neural Network .....	648
<i>Xin Wen, David Brown, Honghai Liu, Qizheng Liao, and Shimin Wei</i>	
New Method for Suppressing Lift-Off Effects Based on Hough Transform .....	653
<i>Wen-long Zhu, Han-xin Shen, and Wen-xiang Chen</i>	

On-Line Monitoring of Winding Deformation of Power Transformer Based on ARM and FPGA .....	657
<i>Shan Zhang, Zhenjiang Cai, Dening Zhang, Hongjuan Kao, and Jinwei Guo</i>	
Parameter-Coupling Probability Hyper-Chaotic Newton Iterative Method and Its Application in Induction Motor Motion .....	660
<i>Mingshan Cai, Nanlan Wang, and Wenhui Wang</i>	
Power Transformer State Assessment Based on Grey Target Theory .....	664
<i>Jianpo Li, Xiaojuan Chen, and Chunming Wu</i>	
Redundant, Autonomous Decentralized Control System for Super High Power Motor Drive .....	668
<i>Jinghe Shi, Shuanghui Hao, Zili Tang, and Minghui Hao</i>	
Research on Double-Motor Synchronous System Based on AC Servo System .....	673
<i>Shuanghui Hao, Jinghe Shi, Ruqi Ma, and Minghui Hao</i>	
Research on Technique of Pulse Electrochemical Surface Finishing .....	677
<i>Hongyou Li, Xiaomei Liu, Yinbiao Guo, Chen Jiang, and Hui Wang</i>	
Research on the Dynamic Characteristics of an Electrodynamics Oscillator .....	681
<i>Linzhen Zhou, Defang Liu, and Bin Wang</i>	
Study of Equivalent Circuit Model for Lead-Acid Batteries in Electric Vehicle .....	685
<i>XueZhe Wei, XiaoPeng Zhao, and YongJun Yuan</i>	
Study on Constant Apparent Power Control Technology of Double-Fed Machine .....	691
<i>Chengwu Lin and Hao Zheng</i>	
Study on Detection Method for Harmonic and Reactive Current in Single-Phase Circuit .....	695
<i>Xiao Lei, Chunlin Guo, Yonghai Xu, and Qiang Liu</i>	
Study on the Operation Region of Induction Traction Motor for Electric Vehicle .....	699
<i>Wei Wang, Qingnian Wang, Yuanbin Yu, Xiaohua Zeng, and Naiwei Zou</i>	
Study on Velocity and Density of Pedestrians Flow in Metro Transfer Station .....	704
<i>Zike Tang and Wusheng Liu</i>	
System Model of Three-Level Switching Power Amplifier for Magnetic Bearing .....	708
<i>Jun Wang and Longxiang Xu</i>	
Test Method Research of Magnetic Saturation Current of High-Frequency Transformer .....	712
<i>Hongtao Ma, Xiaojun Wang, and FenPing Zhou</i>	
Voltage Transfer Characteristic Analysis of Matrix Converter .....	715
<i>Hao Cai, Yue Cai, and Xiaoying Li</i>	

## Session 15a: Engineering Computing and Optimization (I)

A New Method in the Dynamic Performance Study of Spur Gear Pairs .....	721
<i>Chuanmin Zhu</i>	
An Improved Differential Evolution (IDE) Based on Double Populations for Cylindrical Grinding Optimization .....	724
<i>Nanyan Shen, Yongyi He, Jing Li, and Minglun Fang</i>	
Analyses on Wheel-Rail Contact Using Finite Element Method during Passing through Curved Track .....	728
<i>Li Ping Sun, Jian Zhang, and Jun Zhang</i>	
Analysis and Study on Temperature Mathematical Model and Temperature Field in Milling Processing .....	732
<i>X. L. Sui, L. J. Jin, J. T. Zhang, and X. P. Yang</i>	
Analysis for the Impact of the Geometric Parameters of Train Seat on Riding Comfort Based on Human Body CAD Models .....	737
<i>Bo Peng, Yue Yang, and Lu Huang</i>	
Analysis on Dynamic Characteristics of Internal Combustion Engine Crankshaft System .....	742
<i>Xiaomei You, Xingguo Ma, and Bangchun Wen</i>	
Analysis with ADAMS/ANSYS on Dynamic Properties of Rotating Hook-Lift Garbage Truck .....	746
<i>Guanglin Shi, Shuxun Chen, and Guangmin Liang</i>	
Analytical Method of Gasket Stress on Bolted Flanged Connections in Consideration of External Bending Moments and Elements Creep .....	750
<i>Lin Liu and Boqin Gu</i>	
Analyzing Load Case of Mill Roller Bearing with Boundary Element Method .....	754
<i>Xia Yang and Hong Xiao</i>	
Application of Epipolar Line Rectification to the Stereovision-Based Measurement of Workpieces .....	758
<i>He-xi Li, Guo-rong Wang, and Yong-hua Shi</i>	
Application of Topology Optimization to Commercial Vehicle Cab Design .....	763
<i>Deng-feng Wang, Bin Zhang, Jing Chen, Shan-po Wang, and Shen-qiang Liu</i>	
Cavitation Analysis Near Blade Leading Edge of an Axial-Flow Pump .....	767
<i>Can Kang, Minguan Yang, Guangyan Wu, and Haixia Liu</i>	
Collaborative Optimization of Wheel Hub Reducer Based on Reliability Theory .....	771
<i>Xun Deng, Wenming Zhang, and Lingsheng Tong</i>	
Delamination in Thermohyperelastic Plastic IC Packaging Material Due to Thermal Load and Moisture .....	775
<i>Zhigang Li, Xuexia Yang, and Xuefeng Shu</i>	

Fast Mode Decision Algorithm for H.264/AVC Based on All-Zero Blocks Predetermination .....	780
<i>Haoyang Tang and Haoshan Shi</i>	
Fatigue Damage Evaluation on Ferromagnetic Materials Using Magnetic Memory Method .....	784
<i>Jiancheng Leng, Minqiang Xu, Shuai Zhao, and Jiazhong Zhang</i>	
Finite Element Analysis and Checking of LD-A Type Crane Girder .....	787
<i>Xiangbo Ze, Yewang Sun, Xuefeng Yang, and Fang Zhao</i>	
Finite Element Analysis and Shape Optimization of Automotive Crash-Box Subjected to Low Velocity Impact .....	791
<i>Qing-fen Li, Yan-jie Liu, Hai-dou Wang, and Sheng-yuan Yan</i>	
Finite Element Analysis for Bending Stress of Face-Gear .....	795
<i>Shuyan Zhang, Guangming Lei, Minghai Wang, and Hui Guo</i>	
Finite Element Analysis for Gate Rotor Shaft of Single Screw Compressor .....	799
<i>Bin Zhao and Ke Wang</i>	
Finite Element Analysis of Dynamic Characteristic for the XK717 CNC Milling Machine .....	803
<i>Weiwei Wang</i>	
Finite Element Analysis of the Rubber Sealing Yx-ring in Hydraulic Cylinder .....	806
<i>Jian Xie, Gui Tian, and Jun Chen</i>	
Finite Element/Infinite Element Method for Acoustic Scattering Problem .....	810
<i>Ruilang Yang, Caixia Zhu, Xiaowei Fan, and Gaoju Song</i>	
Fractal Characteristics of End Faces of Carbon-Graphite Seal Rings .....	813
<i>Long Wei, Boqin Gu, Xiu Feng, Fei Feng, and Jian Huang</i>	
Frictional Contact Analysis of Turbocharger Compressor-Shaft Sleeve-Shaft .....	817
<i>Ai-hua Liao</i>	
Health Forecast for Aircraft Based on Adaptive MVGFM .....	821
<i>Jianguo Cui, Desheng Song, Ming Li, Changjun Xu, and Peng Shi</i>	
Heat Affected Zone in the MEMS Wire Bonding .....	825
<i>Yuetao Liu, Yanjie Liu, and Lining Sun</i>	
Internal Component Layout Optimization Method for Aircraft Safety Design .....	829
<i>Pei Yang and Bifeng Song</i>	
Maximization of Values of Simple and Multiple Eigenfrequencies of Continuum Structures Using Topology Optimization .....	833
<i>Jinqing Zhan, Xianmin Zhang, and Junfeng Hu</i>	



## Session 15b: Engineering Computing and Optimization (II)

Optimal Design of 6-DOF Parallel Robot Based on Output Frequency Response Function .....	841
<i>Yifeng Zhang and Yu Yao</i>	
Optimal Motion Planning for Free-Floating Space Robots Based on Null Space Approach .....	845
<i>Haitao Shui, Jianwen Wang, and Hongxu Ma</i>	
Optimal Neural Network Modeling Method Based on Data Noise Information .....	849
<i>Yanpo Song, Xiaoqi Peng, and Ying Tang</i>	
Optimal Vibration Control for Offshore Structures Subjected to Wave Loading with Input Delay .....	853
<i>Hai-Hong Wang</i>	
Optimization Design of Shear Probe for Measurement of Ocean Turbulence .....	857
<i>Lei Gu, Shuxin Wang, Yu Wang, Zilong Wang, and Yuhong Liu</i>	
Optimization of Connection Design for Cable Connector in Underwater Monitoring System .....	861
<i>Rui Zhao, Chunjie Qiao, and Yueke Wang</i>	
Optimization on Handling and Temperature Control System of Product/Chemicals Carrier .....	865
<i>Xian-yao Meng, Song Meng, and Xin-jie Han</i>	
Optimized Design for the Decelerator of Portable Pipe Thread Shaping Machine .....	869
<i>Meiling An, Xiqing Mu, and Huali Yu</i>	
Orthogonal Pulses Optimization in High Data Rate UWB System .....	872
<i>Yincheng Qi, Jian Zhia, and Cunxia Di</i>	
Propeller of Amphibious Robot Optimizing Design Based on Integrated Software Platform .....	876
<i>Xueqiang Zhang, Jiancheng Yu, and Aiqun Zhang</i>	
Research on One New Optimized Algorithm of Headlight Distribution Characteristics .....	880
<i>Weiwei Liu, Ping'an Mu, Gang Wang, and Lin Wang</i>	
Research on Optimizing Build Parameters for Stereolithography Technology .....	883
<i>Guangshen Xu, Jing Jin, Sheng Luo, Ronghua Qiu, and Huan Pan</i>	
Research on Relationship between Fractal Parameters and Compressive Stress of Metallic Gaskets .....	887
<i>Xiu Feng, Long Wei, and Feng Lu</i>	
Roll Initial Profile Design and Optimization in Twin-Roll Strip Casting .....	891
<i>Guangming Zhu and Zheng Chang</i>	
Stress Analysis and Optimization of Gear Teeth .....	895
<i>Linhong Xu, Leiming Li, and Yin Liu</i>	

Study on Optimal Delivery Strategy Based on the Mode of Financing Warehouse .....	899
<i>Zhengchi Liu, Mingyong Lai, and Shaoqing Luo</i>	
The Design and Optimization of High Power Oscillator in Broad Band .....	903
<i>Bin Wang, Defang Liu, Ning Zhou, and Linzhen Zhou</i>	
Trajectory Optimization of Spray Painting Robot Based on Adapted Genetic Algorithm .....	907
<i>Fa-zhong Li, De-an Zhao, and Gui-hua Xie</i>	

## **Author Index - Volume 2**

# **2009 International Conference on Measuring Technology and Mechatronics Automation**

**(ICMTMA 2009)**

**Zhangjiajie, China  
11 – 12 April 2009**

**Volume 3  
Pages 1-430**



**IEEE Catalog Number: CFP0913G-PRT  
ISBN: 978-1-4244-3657-6**

# 2009 International Conference on Measuring Technology and Mechatronics Automation

---

## ICMTMA 2009

# Table of Contents

## Volume - 3

---

### Session 16: Mechanical Structure Optimization and Design

Accelerated Fatigue Bench Test of Driving Axle Housing Based on FEA .....	3
<i>Nan Cong, Jianzhong Shang, Xun Chen, Zheng Yang, and Keshan Liang</i>	
Accuracy Synthesis of Stewart Platform Used in Testing System for Spacecraft Docking Mechanism .....	7
<i>Xiaolin Dai, Qitao Huang, Junwei Han, and Hongren Li</i>	
Accurate Equivalent Beam Model of a Planar Compliant Mechanism with Elliptical Flexure Hinges .....	11
<i>Zhaocheng Zhang and Hong Hu</i>	
Algorithm of Pencil-Cut Tool Path Generation for Five-Axis NC Machining of Complex Polyhedron .....	15
<i>Wanjun Li, Dongbiao Zhao, and Min Niu</i>	
Analytical Investigation of Dynamic Characteristic for Stator End-Winding of Turbo-generator of 600MW .....	19
<i>Wei Liao, Yongge Gao, and Haijun Zhang</i>	
Applications of Finite Element Method in Large-Diameter Longitudinal Welded Pipe .....	22
<i>Ying Gao, Qiang Li, Lifeng Fan, and Xu Wang</i>	

Automatic Super Finish Characterizations on Screw Surfaces .....	26
<i>P. S. Pa</i>	
Bipolar Pulse Electroforming in Precision Mold Tooling of Nonmetal Mandrel .....	30
<i>Hongyou Li, Xiaomei Liu, Yinbiao Guo, Chen Jiang, and Hui Wang</i>	
Characterization of Creep Properties of Zeolite Molecular Sieves Using Nanoindentation Test .....	34
<i>Tong Chen, Yong Ma, Xiaoyan Niu, Xuefeng Shu, and Jianwen Zhang</i>	
Computer Aided Analysis of Planting Mechanism of the Seedling Transplanter .....	38
<i>Ting-ting Liu, Shu-lin Hou, Xi Zhao, Li-juan Yin, Cheng-gang Yin, and Qi-feng Wang</i>	
Design and Application for Milled Rumble Strips in China .....	42
<i>Zhi Wang, Yu-jia Tian, and Dian-liang Xiao</i>	
Design of a Novel Deep-Sea Flange Connection Tooling .....	47
<i>Liquan Wang, Wenming Wang, and Caidong Wang</i>	
Design of Automotive Seat Surface Based on Ergonomics .....	51
<i>Pingqing Gan and Xinping Song</i>	
Design of Vehicle Test System for Construction Machinery .....	55
<i>Xiaoxia Jiang, Shaofen Lin, and Yeni Li</i>	
Dimensional Synthesis of a Slider-Crank Mechanism Based Heavy-Load Positioner .....	59
<i>Yunfeng Zhao, Rongxian Qi, and Yongsheng Zhao</i>	
Durability Analysis of Wagon Side Frame Based on the PFMA .....	63
<i>Wei Li, Qiang Li, and Ping Wang</i>	
Dynamic Analysis of the Accelerometer's Shell Based on ANSYS .....	67
<i>Wenyi Sun, Linghui Wu, Baiqing Liu, Wei Fu, and Zhiyuan Liu</i>	
Dynamic Analysis of Tip Set Extra Hard Load of Vertical Shaft Impact Crusher .....	71
<i>Jun-ming Zhang, Fang Zhao, Wei Wang, Xiang-bo Ze, and Dong-ning Su</i>	
Effect of External Bending Moment and Creep on Sealing Behavior of Bolted Flanged Connections .....	75
<i>Zhenguo Sun and Boqin Gu</i>	
FEA on Frictional Contact Problem of Assembly Structure of the Impeller .....	79
<i>Xiaomei You, Bangchun Wen, and Lei Meng</i>	
FEM Analysis and Optimization of Process Parameters in Precision Bar Cutting Process .....	83
<i>ShiWen Du and YongTang Li</i>	
Kinematics Simulation of a Twin Tripod Sliding Universal Joint .....	87
<i>Fu-qin Yang, De-gong Chang, and Xue-feng Wang</i>	
Mechanism and Design of EV Changing Modes Propulsion System .....	91
<i>Lipeng Zhang, Cheng Lin, and Bingnan Qi</i>	

Overall Inverse Kinematics Analysis of Parallel Robot Leg for Rescue Based on Rodrigues Parameters .....	95
<i>Gang Cheng, Shi-rong Ge, Ai-jun Li, and Yong-jian Wan</i>	
Radiation of Arc and Its Application in GTA Welding Measurement and Testing .....	100
<i>Zhiyong Li, Xiaoyan Gu, Yao Wang, and Chunxia Xue</i>	
Key Technology Research on Data Conversion between B-Rep Based CAD and VR Model .....	104
<i>Xianguang Luo, Aiping Li, Xuemei Liu, and Jun Li</i>	
Research of Feature Recognition Method for Box Part Based on STEP .....	108
<i>Sheng-wen Zhang, Yang Liu, and Xi-feng Fang</i>	
Research of Occupational Stress and Its Influencing Factors on Metro Drivers .....	113
<i>Jie Wang, Weining Fang, Like Zhao, Qingmei Hu, and Wengang Fan</i>	
Research on Knowledge-Reuse-Based Windshield Inspection Gauge Design System .....	117
<i>Bin Wang, Defang Liu, Ning Zhou, and Linzhen Zhou</i>	
Research on Lifetime Distribution for Nonmetallic Gasket Sealing .....	121
<i>Yuyan Li and Boqin Gu</i>	
Research on Narrow Gap Welding Parameters Optimization .....	125
<i>Qinghua Lu, Zhishui Yu, Guoxiang Xu, and Jianping He</i>	
Research on the Shaping Approach for Non-cylinder Piston Turning .....	129
<i>Shu-tong Xie, Yin-biao Guo, Qing-quan Yang, and Lu-shuang Chen</i>	
Structural Reliability Analysis of Bus Body in Consideration to the Correlation of Working Conditions .....	133
<i>Daqian Zhang, Tianxia Zhang, Guosheng Zhang, and Weitao Zhao</i>	
Study of Vibration and Noise Performance of Steel Fiber-Free Frictional Material .....	137
<i>Chunling Meng, Xuejun Liu, Li Zhang, and Zhengbing Tian</i>	
The Development of an Extensible CAD/CAM Framework Based on Plug-Ins .....	142
<i>Changbiao Huang, Kaiyong Jiang, Junyi Lin, and Bin Liu</i>	
The Research on Coupler Knuckle of High Speed and Heavy Haul .....	146
<i>Zhanxun Song, Jilong Xie, Zhihua Li, and Ning Zhu</i>	
The Study on Non-cable Telemetry Seismograph for Metal Mineral Exploration .....	150
<i>Hongyuan Yang, Ligu Han, Jun Lin, and Zubin Chen</i>	
Thermal Error Analysis and Optimal Partition Method Based Error Modeling for a Machine Tool .....	154
<i>Rui Zhu, Shijie Dai, Yonglu Zhu, and Yinbiao Guo</i>	
Thermo-mechanical FEM Analysis on Crack Prediction of Solidified Shell in Funnel-Shaped Mold .....	160
<i>Xin Jin, Tingzhi Rng, and Jie Guan</i>	

## Session 17: Intelligence Computation and Application

A Wavelet Coding Method Available in Hardware Design .....	167
<i>Yu Wei, Yanling Hao, and Yushen Li</i>	
Adaptive Genetic Algorithm Applied in Coordinated Control of PSS and STATCOM .....	171
<i>Zhijian Liu, Jilai Yu, and Hongchun Shu</i>	
Algorithm for Surface Directly Interpolated Used in 5-Axis Computer Numerical Controlled System .....	175
<i>Liangji Chen</i>	
An Improved Clonal Selection Classifier Incorporating Fuzzy Clustering .....	179
<i>Gang Li, Jian Zhuang, Hongning Hou, and Dehong Yu</i>	
An LMI Approach to Stochastic Stability Analysis for Uncertain Discrete-Time Markovian Jump Singular System with State-Delay .....	183
<i>Zhiming Zhou and Hongqian Lu</i>	
Application of Elman Neural Network to Width Spread Prediction in Medium Plate Mill .....	187
<i>Lingqi Meng, Haoliang Wu, Jianxun Wang, and Mingjie Lei</i>	
Application of Wavelet Transform in Vehicle Wheel Speed Signal Denoising .....	191
<i>Hai Wang and Weigong Zhang</i>	
Automated Recognition of Wood Damages Using Artificial Neural Network .....	195
<i>Dong Zhao</i>	
Automatic Identification of Highway Horizontal Curves Based on BP Neural Network .....	198
<i>Xiang-hai Meng, Jian Lu, Tian-en Chen, and Qing Liu</i>	
Determination of Material Properties of Functionally Graded Hollow Cylinders Using Artificial Neural Network .....	202
<i>Jiangong Yu</i>	
GA Optimization the Medicine Logistics Distribution Routing .....	206
<i>Jin Zhang, Teng Fei, Wei Li, and Yanqin Li</i>	
Game Theory Model in Assessment and Selection of Transfer Hub's Layout .....	210
<i>Tianqi Gu, Xuewu Chen, and Bei Zhou</i>	
Genetic Algorithm Based Feature Selection for Fracture Surface Images Classification .....	214
<i>Ling Li, Ming Li, YuMing Lu, and YongLiang Zhang</i>	
H-ACO Algorithm for the VRPTW with Re-used Vehicles .....	218
<i>Tao Zhang, Song Song, and Yue-jie Zhang</i>	
Hybrid Traffic Flow Forecasting Model Based on MRA .....	222
<i>Hongqiong Huang, George F. List, Tianhao Tang, Alixandra Demers, and Tianzhen Wang</i>	

Hyper-Chaotic Neural Network Based on Newton Iterative Method and Its Application in Solving Load Flow Equations of Power System .....	226
<i>Mingshan Cai, Rixin Chen, and Lingshuang Kong</i>	
Improved Fairing Algorithm with Optimized Modification Amount of Cloud Data in Reverse Engineering .....	230
<i>N. Meng, Y. Q. Zhou, H. J. Yang, J. Qu, and X. L. Chen</i>	
Intersection Safety Evaluation Method Based on Bayesian Network .....	234
<i>Sheng-xue Zhu, Jian Lu, Qiao-jun Xiang, and Linli Yan</i>	
Iterative Algorithm for Road Simulator Using Smooth Filter .....	238
<i>Bin Wang, Xue-xun Guo, Bo Yang, Gang-feng Tan, and Zhan Xu</i>	
Mixed-Model Assembly Line Balancing Using the Hybrid Genetic Algorithm .....	242
<i>Ying Bai, Hongshun Zhao, and Liao Zhu</i>	
Multi-objective Immune Optimization in Dynamic Environments and Its Application to Signal Simulation .....	246
<i>Zhuhong Zhang and Shuqu Qian</i>	
Multi-objective Intelligent Optimization Model on Dynamic Error Measurement and Fault Diagnosis for Roll Grinder NC .....	251
<i>Xiaoyan Ding, Lilan Liu, Zhengxiao Hua, and Tao Yu</i>	
Multiscale Classification Likelihood Estimation of Weak Boundary through WDHMT Model .....	257
<i>Yinhui Zhang, Yunsheng Zhang, and Zifen He</i>	
Network Intrusion Detection Method Based on Improved Simulated Annealing Neural Network .....	261
<i>Meijuan Gao and Jingwen Tian</i>	
Quality Control Model for Complex Manufacturing System Based on Danger Theory of Biological Immune System .....	265
<i>Genbao Zhang, Haifeng Zeng, Guoqiang Wang, and Gengbao Huang</i>	
Real-Time Pedestrian Detection Based on Improved Gaussian Mixture Model .....	269
<i>Juan Li, Chunfu Shao, Wangtu Xu, and Chunjiao Dong</i>	
Research and Implementation of NURBS Real-Time and Look-Ahead Interpolation Algorithm .....	273
<i>Haitao Wang and Dongbiao Zhao</i>	
Research in Reliability Modeling of WEDM Based on Neural Network .....	277
<i>Hong-bin Zhang and Zhi-xin Jia</i>	
Research on According Calculation of Hydraulic Resistance Coefficients for Recoil Brake of Gun Based on Improved Genetic Algorithm .....	281
<i>Xiaodong Zhang, Peilin Zhang, Jianping Fu, and Cheng Wang</i>	
Research on Fogdrop Diameter Based on Neural Network .....	285
<i>Rui Li and Ziming Kou</i>	



Research on Iterative Algorithm of Parameter Identification for Two Order Distributed Parameter System .....	289
<i>Liequan Liang and Xuan Zhou</i>	
Research on Method of the Subsection Learning of Double-Layers BP Neural Network in Prediction of Traffic Volume .....	294
<i>Yuming Mao and Shiyang Shi</i>	
Research on Modeling for Hydraulic Retarder Internal Pressure Based on Artificial Neural Network .....	298
<i>Jun Yan and Xuexun Guo</i>	
Research on Traffic Flow Base on Neural Network .....	302
<i>Xiaoying Li, Yongzhi Li, and JianXin Liu</i>	
Short-Term Traffic Flow Prediction Based on Parallel Quasi-Newton Neural Network .....	305
<i>Guozhen Tan, Huimin Shi, Fan Wang, and Chao Deng</i>	
Signal Classification Based on Cyclostationary Spectral Analysis and HMM/SVM in Cognitive Radio .....	309
<i>Xinying He, Zhimin Zeng, and Caili Guo</i>	
Study of Signal Feature Recognition Method Based on Morlet Combined Wavelets .....	313
<i>Guang Chen, Zhiliang Ren, and Yaobo Li</i>	
Study on Prediction of Traffic Congestion Based on LVQ Neural Network .....	318
<i>Xiaojun Shen and Jun Chen</i>	
Study on the Surface Quality of Finished by Abrasive Jet with Grinding Wheel as Restraint .....	322
<i>Y. L. Hou, C. H. Li, and B. H. Lu</i>	
Study on Train Operation Adjustment Based on Hybrid Convergent Particle Swarm Optimization .....	326
<i>Xuelei Meng, Limin Jia, Yong Qin, Jie Xu, and Tao Zhou</i>	
Sub-pixel Accuracy for Extracting Corner Point Based on Support Vector Regression .....	330
<i>Xiuzhi Zhang, Longshan Wang, Xiao Sun, and Qiuwei He</i>	
Surface Roughness Prediction and Cutting Parameters Optimization in High-Speed Milling AlMn1Cu Using Regression and Genetic Algorithm .....	334
<i>Z. H. Wang, J. T. Yuan, X. Q. Hu, and W. Deng</i>	
The Application of BP Neural Network Model of DNA-Based Genetic Algorithm to Monitor Cutting Tool Wear .....	338
<i>Shu-zhi Nie and Bang-yan Ye</i>	
The Study on Rate of Nonlinear Direct Cost Based on Neural Network .....	342
<i>Zhengyuan Jia and Lihua Gong</i>	

Vibration Analysis and Prediction of Turbine Rotor Based Grey Artificial Neural Network .....	346
<i>Peng Wen</i>	

## **Session 18: Circuit Design and Systems**

A Novel Measurement System of Electric Power Parameters Based on DSP and ARM .....	353
<i>Qiufeng Shang and Chonggao Du</i>	
Application of DSP in Sensorless PMSM Control System .....	357
<i>Qiu-xia Lu and Xue-ren Dong</i>	
Design and Implementation of Welding with Electromagnetic Trailing Peening Control Circuit .....	361
<i>Meijiu Lu, Yuejin Ma, Jianguo Zhao, Jianchang Li, and Jianjun Hao</i>	
Design of Open-Source Joint C and VHDL "Twin" Program Module Libraries for Digital Signal Processing .....	365
<i>Tao Zeng, Shilong Xue, and François Auger</i>	
Design of Portable System of Measurement and Analysis for Vibration Based on S3C2440 .....	370
<i>Qing He, Bin Tang, and Dongmei Du</i>	
Development of a PLC Virtual Machine Orienting IEC 61131-3 Standard .....	374
<i>Chunjie Zhou and Hui Chen</i>	
Enhanced Boiling Microstructures Applied to Microelectronics Cooling .....	380
<i>Dashi Su, Yong Tang, and Biao Tang</i>	
FPGA Implementation of a Best-Precision Fixed-Point Digital PID Controller .....	384
<i>Yankai Xu, Kai Shuang, Shan Jiang, and Xiaoliang Wu</i>	
Internal Resistance Identification in Vehicle Power Lithium-Ion Battery and Application in Lifetime Evaluation .....	388
<i>Xuezhe Wei, Bing Zhu, and Wei Xu</i>	
Measuring and Controlling of Analog Signal Based on High-Speed I/O Port of PLC .....	393
<i>Hongtao Ma, Xiaojun Wang, and FenPing Zhou</i>	
Modulation Strategy Research for Dual Bridge Matrix Converter on DSP .....	396
<i>Zhiyong Li, Hao Cai, Xiaoying Li, and Xiangdong Kong</i>	
Monte Carlo Localization of Mobile Robot with Modified SIFT .....	400
<i>Yu-quan Wang, Gui-hua Xia, Qi-dan Zhu, and Guo-liang Zhao</i>	
Studying and Realization of Hydraulic Servo System Based on IMC .....	404
<i>Tao Shi, Zhi-kun Chen, and Rui-yin Tang</i>	
The Design of a Miniature Autonomous Surveillance Robot .....	408
<i>Change Zheng</i>	

The Design of an Intelligent Guide Equipment Based on C8051F020 Microcontroller for Optimal Operation of Locomotive .....	414
<i>Ping Li, Yarong Li, and Xiaodong Liu</i>	
The Porting of Real-Time Operating System uC/OS-II on MCS-51 Series of MCU .....	418
<i>Shaofen Lin, Shengbin Zeng, and Xiaoxia Jiang</i>	
<b>Session 19a: Traffic Control and Safety (I)</b>	
A 0-1 Integer LP Formulation for Real Time Optimization of Traffic Signal Control .....	423
<i>Ying Feng, Yanzhi Zhang, and Xiang Li</i>	
A Method of Traffic Dispersion for Accident Management .....	427
<i>Xiaojian Hu, Wei Wang, and Jian Lu</i>	
A Network-Integrated Feature-Driven Engineering Environment: Information Modeling and Process Management .....	431
<i>Guo-xian Wang, Wen-zu Zhang, and Andrew Yeh-Ching Nee</i>	
A NGSII Based Parameter Calibration Algorithm for Traffic Microsimulation Model .....	436
<i>Weinan Huang and Jian Sun</i>	
A Novel On-Road Object Detection Approach Based on Vision .....	440
<i>Yongquan Xia, Min Huang, Wei Cui, Fengqin Wang, and Xiaolei Chen</i>	
A Spatial Decision Support System for Large Scale Vehicle Routing .....	444
<i>Xinjie Yu and Kangsheng Liu</i>	
A Study on Chaos in the Traffic Flow Based on the Coupled Map Model .....	450
<i>Lijun Liu and Song Li</i>	
Aircraft Pose Recognition Using Locally Linear Embedding .....	454
<i>Wenting Yuan, Peng Jia, Luping Wang, and Lin Shao</i>	
An Improved Cellular Automaton Model for Urban Walkway Bi-directional Pedestrian Flow .....	458
<i>Tao Wang and Jun Chen</i>	
An Improvement of the Binary Logit Model for Trip Generation Forecasting .....	462
<i>Chunyan Li and Jun Chen</i>	
An Integrated System of Freeway Toll and Traffic Data Investigation: PDF417 Two-Dimensional Bar Code System .....	466
<i>Yongfei Yan, Shunying Zhu, and Hong Wang</i>	
An Unscented Particle Filter Approach to Estimating Real-Time Traffic State .....	471
<i>Yongjun Zheng, Wenjun Li, Bin Sun, and Yanhua Jin</i>	
Analysis and Evaluation on the Rear-End Crash of the Car with a Dummy .....	475
<i>Guangyao Zhao, Liyang Xie, Yunpeng Guo, and Jinghong Li</i>	

Analysis of the Relation between Highway Horizontal Curve and Traffic Safety .....	479
<i>Yingxue Zhang</i>	
Analyzing the Speed Dispersion Influence on Traffic Safety .....	482
<i>Fangqiang Lu and Xuewu Chen</i>	
Application of Dynamic Route Selection Model in Urban Transportation Distribution .....	486
<i>Xiao-lan Liu and Wei Cheng</i>	
Application Research of Visual Cognition Probabilistic Model on Urban Tunnel's Sign .....	490
<i>Zhigang Du and Xiaodong Pan</i>	
Automobile Driveline Test System Development .....	494
<i>Gangfeng Tan, Xuexun Guo, Bin Wang, Baoyu Wu, and Jun Yan</i>	
Ballast Accidents Analysis and Evaluation of Urban Rail Transit Based on Method of Causality Analysis and Faulty Tree Analysis .....	498
<i>Jing He and Zhi-gang Liu</i>	
Danger Forecast of Tunnel in Excavation .....	503
<i>Ling-qiang Yang and Jing Ma</i>	
Discussion of Max-limited Speed for Work Zone of Highway Based on Information Processing .....	506
<i>Yihu Wu, Xiaomei Yin, and Dan Yu</i>	
Discussion on the Prediction Method of the Pavement Performance for Expressway .....	511
<i>Xiao-ming He, Peng Guan, Guo-xiang Hu, and Lin Zhou</i>	
Driving Stability of Closed Loop Tractor-Semitrailer Vehicle System with Optimal Driver Model .....	514
<i>Xian-sheng Li, Jian-guo Zhang, and Meng-yao Wang</i>	
Estimation of Traffic Risk of Level Crossing Based on Stochastic Petri Nets Models and Social Economic Data .....	518
<i>Wei Zheng, J. R. Mueller, R. Slovak, and E. Schnieder</i>	
Influence of Vehicle Parameters on the Dynamics of Pavement Structure Due to Vehicle-Road Interaction .....	522
<i>Haoyu Li, Shaopu Yang, and Shaohua Li</i>	
Matter Elements Evaluation Approach of Traffic Safety in Jiangsu Province Based on Information Entropy .....	526
<i>Wei Deng, Bing Zhang, and Jianrong Liu</i>	
Networking Dual-Surveillance/Dual-Telepaths to Sustain Parking Structures .....	530
<i>Li-Yen Hsu</i>	
Positioning Mobile Vehicle by Using Super-Short Baseline with AM Ultrasonic Beacon .....	536
<i>Jianjun Long, Baihai Wu, Jinping Wu, and Tibing Xiao</i>	

Prediction of the Position of Pedestrian Crossing Road Section Based on Kalman Predictor .....	541
<i>Guo-sheng Ma, Jiao Yao, and Xiao-guang Yang</i>	

**Session 19b: Traffic Control and Safety (II)**

Real-Time Highway Traffic Accident Prediction Based on the k-Nearest Neighbor Method .....	547
<i>Yisheng Lv, Shuming Tang, and Hongxia Zhao</i>	
Research of Urban Bus Stop Planning Based on Optimization Theory .....	551
<i>Li-qun Liu and Yan Zhang</i>	
Research on AI Planning Based Modeling Method for Area Traffic Signal Control .....	555
<i>Chenmu Yu, Shuhua Liu, Yu Zhang, and Jie Liu</i>	
Research on Chaotic Characteristics for Freeway Traffic Flow .....	559
<i>Yu-mei Zhang and Shi-ru Qu</i>	
Research on the Display Mode of Locomotive Velocity Tracing .....	563
<i>Ye Deng, Weining Fang, Qiang Li, Lin Ding, and Qingmei Hu</i>	
Research on the Impact of U-turn Location on Operation Efficiency at Intersection .....	567
<i>Junqiang Leng, Hantao Zhao, and Qian Zhang</i>	
Research on the Transfer Time Reliability of Urban Passenger Hub .....	571
<i>Li Zhao, Zhenzhou Yuan, Yanhong Li, and Zhihong Li</i>	
Research on Variable Lane Signalized Control Method .....	575
<i>Li-li Li, Zhao-wei Qu, Xian-min Song, and Dian-hai Wang</i>	
Road Network Analysis and Evaluation of Huizhou City Based on Space Syntax .....	579
<i>Zheng-yu Duan and Quan Wang</i>	
Safety Assessment for Stability of High-Railway Soft Loadbed Based on Rheological .....	583
<i>Jun Wang, Ping Cao, and Hang Lin</i>	
Safety Design of Median Barriers Impacted on Elevated Road .....	586
<i>Zhong Wu, Fengru Yu, and Li Yuan</i>	
Safety Evaluation Method of Roadway Intersection .....	590
<i>Li Yuan and Jian Lu</i>	
Study on Organization and Capacity of Waiting-Area for Through Vehicles at Signalized Intersection .....	594
<i>Ming Yang, Xiaoming He, Jie Li, and Rong Lu</i>	
Study on Saturation Flow Rates for Signalized Intersections .....	598
<i>Guoqiang Zhang and Jun Chen</i>	

Study on the Influence of Signal Countdown Device on Traffic Safety of Intersections .....	602
<i>Keping Li, Sheng Dong, Jian Sun, and Xuan Yu</i>	
Study the Test Methods and Pavement Performance Indexes about Hard Asphalt Binder Material .....	607
<i>Renjie Qin and Li Yuzhi</i>	
Support Vector Machines for Incident Detection in Urban Signalized Arterial Street Networks .....	611
<i>Zhaosheng Yang, Ciyun Lin, and Bowen Gong</i>	
The Influence of Discrete Character of Following-Velocity on Chaotic Character of Traffic Flow in Different Density .....	617
<i>Dan Yu, Xiaomei Yin, and Jixiang Xie</i>	
The Loss of Traffic Noise in Chinese Key Cities .....	622
<i>Caixia Zhu, Fuqin Ma, Yide Zhou, and Gaoju Song</i>	
The Simulation Research of Non-parametric Regression for Short-Term Traffic Flow Forecasting .....	626
<i>Xiao-li Zhang and Hua-pu Lu</i>	
The Traffic-Flow Detection Based on Pseudo-Random Coded Radar .....	630
<i>Jun Zhang</i>	
Traffic Accident Macro Forecast Based on ARIMAX Model .....	633
<i>Chunyan Li and Jun Chen</i>	
Traffic Accident Treatment Expert System Based on Integrated Reasoning .....	637
<i>Bing Xu and Wen-hua Yan</i>	
Traffic Speed-Flow Model for the Mix Traffic Flow on Beijing Urban Expressway .....	641
<i>Yue Li, Huapu Lu, Changzhi Bian, and Ya Gang Sui</i>	
Traffic Video Based Cross Road Violation Detection .....	645
<i>Jun Zhang, Tao Gao, and Zheng-guang Liu</i>	
Travel Time Estimation for Recurrent Jammed Flow on Shanghai North-South Expressway .....	649
<i>Peng Chen, Keping Li, and Jian Sun</i>	
Urban Traffic Flow Guidance System Based on Data Driven .....	653
<i>Ming Zhao</i>	
Urban Traffic Signal Learning Control Using SARSA Algorithm Based on Adaptive RBF Network .....	658
<i>Chun-gui Li, Meng Wang, Shu-Hong Yang, and Zeng-fang Zhang</i>	

## Session 20: Information Logistics

An Equilibrium Analysis of Outsourcing Service Competition with Sequential Decisions Order .....	665
<i>Huiqiu Wu and Yan Li</i>	
An Improved Delphi Method for Machinability Evaluation and Examination in Process Planning .....	669
<i>Huan-Min Xu, Jing Wei, and Ming-Hai Yuan</i>	
Analysis on Temperature Field of Refrigerated Car in Cold Chain Logistics .....	673
<i>Xin Huang, Ruhe Xie, and Guanghai Liu</i>	
Attributes of Urban Logistics Nodes and Their Mathematical Description .....	677
<i>Guo-Qi Li and Jin Zhang</i>	
Product Configuration Based on CBR and CSP .....	681
<i>Yan-hong Qin and Guang-xing Wei</i>	
Product Lifecycle-Oriented Virtual Design Method .....	685
<i>Jun Li, Ai-ping Li, Xian-guang Luo, and Xue-mei Liu</i>	
Products Development Process Based on DSM and Its Optimization .....	689
<i>Tao Feng, Bing Chen, Dinghua Zhang, and Shan Li</i>	
Strategic Supply Chain of Multi-project: An Owners' Perspective .....	693
<i>Zhonglin Chen, Qiaoting Dong, and Yingming Shen</i>	
The Construction of Reverse Logistics Network about the Reusable Packages .....	698
<i>Xiangru Meng and Hua Jiang</i>	
The Study of Universal Logics Control and Its Comparison to Other Control Methods for Double-Order Inverted Pendulum .....	702
<i>Li Liu</i>	

## Session 21: Agent Systems

Agent-Oriented Boolean Token and Colored Transition Petri Net for Workflow Management .....	709
<i>Jie Sui, Longtao He, and Hua Yu</i>	
An Extensible Multi-agent Based Traffic Simulation System .....	713
<i>Cheng Tao and Shengguo Huang</i>	
Multi-agent Delay Simulation Model in Mass Rail Transit System .....	717
<i>Zhibin Jiang and Chao Xie</i>	
PD-Agent: A Flexible Agent BDI Model for Autonomic Computing .....	721
<i>Yanbin Peng, Zhijun Zheng, Beishui Liao, Ji Gao, Zhenyu Lu, and Xueqin Jiang</i>	
Process Modeling of Agent Federation-Based Rapid Design .....	725
<i>Minghai Yuan, Liao Zhu, and Huanmin Xu</i>	
Study on the Construction Method of Networked Service Oriented System for RP .....	730
<i>Di Wu, Qingxi Hu, YuanYao, and Haiguang Zhang</i>	

## Session 22: Other Applications

A Functional Safety Analysis Approach for Analyzing CBTC System .....	737
<i>Xianqiong Zhao, Tao Tang, and Fei Yan</i>	
A High Accurate Approach for InSAR Flat Earth Effect Removal .....	742
<i>Shurong Peng, Kexue He, Yaonan Wang, Juan Lu, Jiwei Deng, and Haixia Xu</i>	
A Novel Fast Motion Estimation Algorithm Based on Starting Search Point Prediction .....	746
<i>Zhaohua Lin and Yanbiao Zou</i>	
A Study of Influence of Temperature on Crack Propagation Behavior of Asphalt Concrete .....	750
<i>Tao Xie, Zezhong Jiang, Yanjun Qiu, and Bo Lan</i>	
Assembly Accuracy Based Tendency Analysis and Predicting Method for Product Behavior .....	754
<i>Pengzhong Li, Weimin Zhang, and Lei Yang</i>	
Data Sharing and Exchanging Method for Urban Traffic Control System Based on XML .....	758
<i>Jiuchun Gu, Yanguo Qu, and Zhenhua Zhang</i>	
Dynamic Performance Evaluation Model of Collaborative Knowledge Chain in Collaborative Manufacturing Process .....	762
<i>Hao Li, Guofu Luo, Jun Ma, and Bin Wang</i>	
Evaluation of Gaussian Linear Model Order Selection Approaches .....	767
<i>Yu-Ming Du, Xiao-dan Du, and Fu-gui Zhang</i>	
From Laplacian Eigenmaps to Kernel Locality Preserving Projections: Equivalence or Improvement? .....	771
<i>Peng Jia, Junsong Yin, Zongtan Zhou, and Dewen Hu</i>	
Impact Experimental Study and Theoretical Analysis on Energy Absorbing Capability of Splitting and Curling of Tubes .....	775
<i>Zhifang Liu, Guoyun Lu, and Shanyuan Zhang</i>	
Influence of Filler on Asphalt Mortar's Viscosity .....	778
<i>Ping Li, Chenguang Kong, and Zhengqi Zhang</i>	
Integration Technology for Complex Product Development Process .....	781
<i>Ci-jun Xu, Ai-ping Li, and Xue-mei Liu</i>	
Kinematics Analysis of a Novel Translational Parallel Manipulator .....	785
<i>Daning Yuan and Yanbin Zhang</i>	
Methods Supporting Product Modular Design for Assembly .....	789
<i>Xiaoyan Teng, Fankai Kong, and Jiatai Zhang</i>	
On Mapping Approach of CN to FR in Product Family Improvement .....	794
<i>Yan-hong Qin and Guang-xing Wei</i>	
Performance Analysis of Self-Calibration Algorithm for L-shaped Array .....	798
<i>Biao Wu and Hui Chen</i>	



Performance Evaluation of Home Gateway System Based on GSPN .....	803
<i>Lin Chen, Shutao Wei, and Linxiang Shi</i>	
Predictive Feedback Scheduling for Resource-Constrained Networks with Flexible Workload .....	807
<i>Zuxin Li, Wenjun Hu, Wanliang Wang, and Bicheng Lei</i>	
Real Time Tracking of Moving Pedestrians .....	811
<i>Juan Li, Chunfu Shao, Wangtu Xu, and Hao Yue</i>	
Reliability Analysis of an Axis-Line Measuring and Management Decision-Making System for Rotary Kiln .....	816
<i>Xuejun Li, Guangfu Bin, B. S. Dhillon, and Pingyu Zhu</i>	
Research and Development of Rice Color Sorter .....	821
<i>Zhihong Wu, Yuan Zhu, Guoqiang Chen, Xinying Shi, and Jiayun Feng</i>	
Research on a Vehicle Routing Schedule to Reduce Fuel Consumption .....	825
<i>Yong Peng and Xiaofeng Wang</i>	
Research on Cast-Rolling Model in Twin-Roll Continuous Strip Casting .....	828
<i>Guangming Zhu and Zheng Chang</i>	
Research on Estimation of Acoustic Travel-Time in Soybeans .....	832
<i>Hua Yan, Guan Nan Chen, Ying Xu, and Hui Xu</i>	
Research on Model and Its Solving Algorithm for Transit Scheduling Problem .....	836
<i>YongFeng Dong, NaNa Li, ZhengChao Dong, Junhua Gu, and Weini Li</i>	
Research on the Innovative Examination Method of Vertical Tank Capacity .....	840
<i>Shizhong Tong, Zhi Xie, Changhai Li, Weiwei Yin, Junjie Ma, and Guizeng Fu</i>	
Research on the Servo Lag Error and Compensation in Cam Non-circular Grinding Process .....	843
<i>Jing Li, Yongyi He, Nanyan Shen, and Minglun Fang</i>	
Research on Time Reliability of Container Liner Shipping Network .....	847
<i>Peijian Wu, Guishi Deng and Wei Tian</i>	
Research on Web Service-Based Interoperability of Heterogeneous PDM Systems .....	851
<i>Yaping Wang, Jianghua Ge, Junpeng Shao, and Songtao Han</i>	
Separation of Geostationary Satellites with Eccentricity and Inclination Vector .....	855
<i>Jiancheng Li</i>	
Ship Manipulation Evaluation System .....	859
<i>Qingyang Xu, Xianyao Meng, and Ning Wang</i>	
Simplified Assessment of Embedded Crack in Thin-Wall Pressure Vessel .....	863
<i>Wei Tang and Jian Sun</i>	
Simultaneous Stabilization for a Class of Generalized Linear System .....	867
<i>Jing Ma and Kun Ma</i>	
Smooth Modules .....	871
<i>Chuan-yu Xu</i>	

Smooth Projective Modules .....	875
<i>Chuan-yu Xu</i>	
Stability Analysis of Grooved Journal Bearings in High-Speed Hard Disk Drive Considering Thermal Effect .....	879
<i>Honglai Li, Shuzhong Lin, Jing Wang, Zhiguo Zheng, Jintai Lin, and Zhongyu Liang</i>	
Study of Basic Method about WSD Based on Chaos .....	883
<i>Chen Wei, Meng Chen, Cui Shao Hui, and Yang Suo Chang</i>	
Study on Pressure Loss for a Muffler Based on CFD and Experiment .....	887
<i>Jianhua Fang, Yiqi Zhou, Peigang Jiao, and Zaishan Ling</i>	
Study on the Aging Properties of Polymeric Composites by Using Accelerated Test Method .....	891
<i>Jeong-Pyo Nam and Qingfen Li</i>	
Study on the Application of Multi-objective Grey Situation Decision-Making Theory for Transportation Mode Choice .....	895
<i>Dazhi Jiang, Wei Deng, and Xiaoli Zhang</i>	
The Analysis of System Feedback Structure of Military Civil Industry Fusion Development Model .....	899
<i>Fengjun Xie and Yunzhu Wang</i>	
The Computer Aided Emergency Management System for Highway Tunnels .....	903
<i>Jiantao Chen, Yunhua Li, and Dongxiao Liu</i>	
The Container Yard Producing Simulation and Equipment Configuration .....	907
<i>Wuyuan Yan</i>	
The Expanded Application Research of Deep Cryogenic Treatment .....	911
<i>Zongbao Wu</i>	
The Improvement and Study of Detection Performance on PDT .....	915
<i>Zhiyong Lei and Hanshan Li</i>	
Wireless Search and Rescue Command System Based on Live Animals .....	919
<i>Bo You and Jiqiang Luan</i>	

### **Author Index - Volume 3**