

# **2008 IEEE/ASME International Conference on Advanced Intelligent Mechatronics**

**Xian, China  
2-5 July 2008**

**Pages 1-476**





**IEEE Catalog Number:**  
**ISBN 13:**

**CFP08775-PRT**  
**978-1-4244-2494-8**

# Table of Contents

## WM - 1: Modular Robots

	Comparison of Gait Generation methods in Quadruped Walking <i>Osman Darici, Mehmet Kursat Yalcin, Hakan Temeltas</i>	1
	Connection Methodology for Two Ubiquitous Robot Spaces <i>Hyun Min Do, Yong-Shik Kim, Bong Keun Kim, Tamio Tanikawa, Kohtaro Ohba, Janarbek Matai, Young-Ho Suh, Hyoung Sun Kim, Jae-Yeong Lee, Wonpil Yu</i>	7
	Goal Recognition and Configuration Recognition Algorithms for Modular Robots <i>Mehran Balaei</i>	13
	A Pragmatic System to Support Interactive Modular Fixture Configuration Design in Desktop Virtual Environment <i>Gaoliang Peng, Gongdong Wang, Yanhai Chen</i>	19
	Design and Realization of a Remote Control Centimeter-Scale Robotic Fish <i>Xiufen Ye, Yudong Su, Shuxiang Guo, Liqun Wang</i>	25

## WM - 2: Actuators I

	Optimum Design of Pneumatic Multi-chamber Rubber Tube Actuator Generating Traveling Deformation Waves for Colonoscope Insertion <i>Hisakazu Onoe, Koichi Suzumori, Shuichi Wakimoto</i>	31
	Study of the Inertial Effect on Interaction between Flat Belt and Pulley <i>Da-Yu Zheng</i>	37
	An Active Micro Reactor System with Integrated Fluid Control Devices for Chemical Synthetic Process <i>Hironari Taniguchi, Koichi Suzumori, Shintaro Nakatani</i>	43
	Smart materials for screw-in cartridge valves <i>Xiaoping Ouyang, Derek Tilley, Patrick Keogh, Huayong Yang</i>	49


## WM - 3: Diagnosis

	Sequential Diagnosis for Rolling Bearing Using Fuzzy Neural Network <i>Huaqing Wang, Peng Chen</i>	56
	Noise Reduction in Computed Order Tracking Based on FastICA <i>Yu Guo, Yilin Chi, Huawen Zheng</i>	62
	Analysis and Processing of Medical CT Image Based Multifractal Theory <i>Lei Yu, Dawei Qi</i>	68
	The Application and Research of the Intelligent Fault Diagnosis for Marine Diesel Engine <i>Peng Li, Lei Liu</i>	74

## WM - 4: Manipulators

	A Semi-Analytic Model for Large Deflection Beam-Based Flexure Joints <i>Tat Joo Teo, I-Ming Chen, Guilin Yang, Wei Lin</i>	78
	Analysis of the Kinematics of Module Climbing Caterpillar Robots <i>Wei Wang, Houxiang Zhang, Yingying Wang, Kun Wang, Jinwei Zhang</i>	84
	Observation of Link Deformations of a Robotic Manipulator with Fiber Bragg Grating Sensors <i>Rene Franke, Frank Hoffmann, Torsten Bertram</i>	90
	Adaptive Force/position Control of Robot Manipulators <i>Vladimir Filaretov, Alexandr Zuev</i>	96

	Application of Nonlinear PD Learning Control to a Closed Loop Manipulator <i>Puren Ouyang, Chris Zhang</i>	102
<b>WM - 5: Mobile Robots I</b>		
	Towards an Electric-Powered Air-Gliding Skateboard <i>Qing Shan, Jason L. Yang, C. S. Chan, Guanglie Zhang, Wen J. Li</i>	108
	A Study on Development of Home Mess-Cleanup Robot McBot <i>Seungwoo Kim, Youngkak Ma, Dongik Oh</i>	114
	Mobility Performance Analysis of Lunar Rover Based on Ground Vehicles Theory <i>Peng Zhang, Zong-quan Deng, Ming Hu, Hai-bo Gao</i>	120
	Track-terrain interaction analysis for tracked mobile robot <i>Weidong Wang, Zijiang Du, Lining Sun</i>	126
	Embedded Vehicle Control System Based on Voice Processing Technologies <i>X. L. Zhou, Z.Y. Sun, Z. Y. Liu, F. M. Guo</i>	132
<b>WA - 1: Machine Vision I</b>		
	A Virtual Simulation System of TDI Line Scan Camera <i>Xiaoli Chen</i>	138
	Selection for Visualization: Voronoi Tessellation of Large Scale and Sparsely Distributed Data <i>Zhengxu Zhao, Jinsheng Fan</i>	145
	Edge Linking Algorithm <i>Zhijie Wang, Hong Zhang</i>	151
	Structural Parameters Optimal Design and Accuracy Analysis for Binocular Vision Measure System <i>Qiong Liu, Xiansheng Qin, Shenshun Yin, Feng He</i>	156
	Method of Vehicle Classification Based on Video <i>Zhong Qin</i>	162
<b>WA - 2: Human - Machine Interaction I</b>		
	Telerobotic System for Cell Manipulation <i>Igor Gaponov, Hyun-Chan Cho, Jee-Hwan Ryu, Seong-Joo Choi</i>	165
	Development of an Operation Skill-Training Simulator for Double-Front Work Machine <i>Mitsuhiro Kamezaki, Hiroyasu Iwata, Shigeki Sugano</i>	170
	Influence of Animal Body on Ingested Wireless Device before and after death <i>Lisheng Xu, Max Q.-H. Meng, Yawen Chan, Chao Hu, Haibin Wang</i>	176
	Haptic Human-machine Interaction by Active, Holonomic Moving Devices <i>Markus Koch</i>	182
	A generic architecture for emotion and personality <i>Duhaut Dominique</i>	188
<b>WA - 3: Sensing I</b>		
	Contact Points Detection for Tracked Mobile Robots Using Inclination of Track Chains <i>Daisuke Inoue, Masashi Konyo, Kazunori Ohno, Satoshi Tadokoro</i>	194
	Subject Independent Agitation Detection <i>George Sakr, Imad Elhaji, Huda Abu-Saad Huijer, Cheryl Riley-Doucet, Debatosh Debnath</i>	200
	A Real-time Machine Vision System for Solder Paste Inspection <i>Huihui Wu, Xianmin Zhang, Yongcong Kuang, Shenglin Lu</i>	205
	Research on displacement sensor of two-circle reflective coaxial fiber bundle <i>Xiaodong Zhang, Liang Yang</i>	211

Multi-Modal Motion Sensing and Control for a Robotic Manipulator <i>Yong Liu, Ning Xi, Sheng Bi, Bingtuan Gao, Yantao Shen, Quan Shi, Xiongzi Li, George Zhang, Thomas A. Fuhlbrigge</i>	217
<b>WA - 4: Flexible Manipulators</b>	
Development of a Low-cost Flexible Modular Robot GZ-I <i>Houxiang Zhang</i>	223
Deadlock Prevention Policy based on Elementary Siphons for Flexible Manufacturing systems <i>Mingming Yan, Hesuan Hu, Zhiwu Li</i>	229
New Visco-Elastic Mechanism Design for Flexible Joint Manipulator <i>Taisuke Sugaiwa</i>	235
Postural Stability Evaluation of Spatial Wheeled Mobile Robots with Flexible Suspension over Rough Terrains <i>Khalil Alipour, S. Ali A. Moosavian, Yousef Bahramzadeh</i>	241
Dynamic Analysis of Compliant Mechanisms Using the Finite Element Method <i>Wenjing Wang, Yueqing Yu</i>	247
<b>WA - 5: Mobile Robots II</b>	
Mobile Robots Path Planning in Three-Dimensional Environment Based on ACO-PSO Hybrid Algorithm <i>Chunxue Shi, Yingyong Bu, Jianghui Liu</i>	252
 Navigation Using One Laser Source for Mobile Robot with Optical Sensor Array Installed in Pan and Tilt Mechanism <i>Keigo Hara, Masahiro Inoue, Shoichi Maeyama, Akio Gofuku</i>	257
Dynamic Path Planning for Mobile Robots Using Chaotic Prediction <i>Qian Jia, Xingsong Wang</i>	263
Analysis of crossing obstacle and simulation of a robot with wheel-legs <i>Diansheng Chen, Yu Huang, Tianmiao Wang</i>	269
Kinematical Model-Based Yaw Calculation for an All-Terrain Mobile Robot <i>Xiaokang Song, Yuechao Wang, Zhenwei Wu</i>	274
<b>WP - 1: Machine Vision II</b>	
Novel Application of a Laser Range Finder with Vision System for Wheeled Mobile Robot <i>Ya-Chun Chang, Hidemasa Kuwabara, Yoshio Yamamoto</i>	280
Predictive Sampling and Reconfigurable Technology Based Intelligent Memory-measurement System <i>Guangping Qi, Ping Song, Kejie Li</i>	286
Visual Servoing Based on Fuzzy Adaptive PID with Modified Smith Predictor for Micromanipulation <i>Xiangjin Zeng</i>	290
Vision-Based System for Satellite On-Orbit Self-Servicing <i>Guoliang Zhang, Hong Liu, Jie Wang, Zainan Jiang</i>	296
Shadow Casting Stereo Imaging for High Accurate and Robust Stereo Processing of Natural Environment <i>Yasuharu Kunii</i>	302
<b>WP - 2: Design &amp; Prototyping</b>	
Test of Base Vibration Influence on Dynamics of A Magnetic Suspended Disk <i>Guoping Ding</i>	308
Pressure and Speed Control of Electro-hydraulic Drive for Shield Tunneling Machine <i>Hu Shi, Guofang Gong, Huayong Yang</i>	314

A 1-D Lumped Theoretical Model for CMUT <i>Wenchao Zhou, Ting Yu, Fengqi Yu</i>	318
On Tolerance Problem of Contacting Polyhedral Objects <i>Wen-Hua Pan, Jing-Sin Liu</i>	323
Design, Analysis and Experiment of the Feed Cable-Suspended Structure <i>Baoyan Duan, Yuanying Qiu, Fushun Zhang, Bin Zi</i>	329
<b>WP - 3: Teleoperation</b>	
Stable Bilateral Teleoperation using the Energy-Bounding Algorithm: Basic Idea and Feasibility Tests <i>Changhoon Seo, Jaeha Kim, Jong-Phil Kim, Joo Hong Yoon, Jeha Ryu</i>	335
General Scheme of Teleoperation for Space Robot <i>Xueqian Wang, Wenfu Xu, Bin Liang, Cheng Li</i>	341
Stable Mobile Robots Teleoperation via Potential Field Method <i>Adha Cahyadi, Ya-Chun Chang, Yoshio Yamamoto</i>	347
Switching of Control Signals in Teleoperation Systems: Formalization and Application <i>Ildar Farkhatdinov, Jee-Hwan Ryu</i>	353
Event-based Predictive Control Strategy for Teleoperation via Internet <i>Dan Chen, Ning Xi, Yuechao Wang, Hongyi Li, Xusheng Tang</i>	359
<b>WP - 4: Dual Arm/Cooperative</b>	
Posture Analysis of a Dual-crawler-driven Robot <i>Shugen Ma, Qiquan Quan, Rongqiang Liu</i>	365
A Web Based Collaborative Portal for Remote Monitoring and Analysis of Livestock Farm Odor <i>Rui Liu, Leilei Pan, Simon X. Yang, Max Q.-H. Meng</i>	371
Mechanical Design and Impedance Compensation of SUBAR (Sogang University's Biomedical Assist Robot) <i>Kyoungchul Kong, Masayoshi Tomizuka, Hyosang Moon, Beomsoo Hwang, Doyoung Jeon</i>	377
A Sampling-based Path Planner for Dual-arm Manipulation <i>Mokhtar Gharbi, Juan Cortes, Thierry Simeon</i>	383
Deployment of Multi-robot Systems under the Nonholonomic Constraint <i>Yu Zhou, Jindong Tan</i>	389
<b>WP - 5: Mobile Robots III</b>	
 Mobility of Legged Robot by Non-contact Impedance Control <i>Fumiaki Takemori, Naoki Tomita, Daisuke Kushida, Akira Kitamura</i>	395
MHS Measure for Postural Stability Monitoring and Control of Biped Robots <i>Amir Takhmar, Mansoor Alghooneh, Khalil Alipour, S. Ali A. Moosavian</i>	400
Development of a Mobile Robotic Platform for the Underground Distribution Lines <i>Jean-Francois Allan, Ghislain Lambert, Samuel Lavoie, Stephane Reiher</i>	406
Environment Recognition System based on Multiple Classification Analyses for Mobile Robot <i>Atushi Kanda, Masanori Sato, Kazuo Ishii</i>	412
Design and Experiments on a New Wheel-Based Cable Climbing Robot <i>Fengyu Xu, Xingsong Wang</i>	418
<b>WE - 1: Electromagnetic Devices I</b>	
Follow-up Control of Pneumatic Cylinders by Passive Dynamic Control <i>Yasuhiro Minamiyama, Takanori Kiyota, Takumi Sasaki, Noboru Sugimoto</i>	424

Precise Speed Control of Brushless DC Motors Based on Optimal Control <i>Hao Wu, Xinya Sun, Yindong Ji</i>	430
On Coupled Structural-Electromagnetic Modeling and Analysis of Rectangle Active Phased Array Antennas <i>C. S. Wang, W. Wang, H. Bao, F. S. Zhang, X. A. Li</i>	435
Dynamic Characteristics Study of Single-Sided Linear Induction Motor Using Finite Element Method <i>Junfei Han</i>	439
Torque Modeling of a Permanent Magnet Spherical Actuator based on Magnetic Dipole Moment Principle <i>Chee Kian Lim, I-Ming Chen, Liang Yan, Guilin Yang, Wei Lin, Kok-Meng Lee</i>	445
<b>WE - 2: Actuators II</b>	
Design, Analysis and Control of a Fast Nanopositioning Stage <i>Yuen Kuan Yong, Sumeet Aphale, Reza Moheimani</i>	451
Dedicated Controller Design for a Dual-stage Opto-mechatronic System <i>Michael Stalder, Yvan Michellod, Philippe Mullhaupt, Denis Gillet</i>	457
Experimental Study on a Hybrid Actuation System <i>Puren Ouyang, Wunjun Zhang</i>	465
Robust Adaptive Tracking Control of Electrostatic Microactuators with Uncertainty <i>Wenlei Li, Peter X. Liu</i>	471
Development of Rate Independent Prandtl-Ishlinskii Model for Characterizing Asymmetric Hysteresis Nonlinearities of SMA Actuators <i>Mohammad Al Janaideh, Chun-Yi Su, Subash Rakheja</i>	477
<b>WE - 3: Medical Robotics</b>	
Dynamics Computation of Link Mechanisms Employing COG Jacobian <i>Takashi Sonoda, Kazuo Ishii, Digoro Isobe</i>	482
Novel Approach for Lower Limb Segment Orientation in Gait Analysis Using Triaxial Accelerometers <i>Kun Liu, Tao Liu, Kyoko Shibata, Yoshio Inoue, Rencheng Zheng</i>	488
 Optic-Tactile Robotics and Medical Applications <i>Markus Koch, Juergen Schrage, Willi Richert</i>	493
In Situ Micro-Force Sensing and Quantitative Elasticity Evaluation of Living Drosophila Embryos at Different Stages <i>Uchechukwu C. Wejinya, Yantao Shen, Ning Xi</i>	498
Proposal of an Admittance Enhanced Redundant Joint Mechanism to Improve Backdrivability <i>Kiyoshi Nagai, Yosuke Ikegami, Rui C. V. Loureiro, William S. Harwin</i>	504
<b>WE - 4: Parallel Manipulators</b>	
Position and Singularity Analysis of A Novel 3-RPUR Parallel Platform Mechanism <i>Shihua Li, Ning Ma, Changcheng Yu</i>	510
Kinematic Analysis of A Novel 3-DOF 3-RPUR Translational Parallel Mechanism <i>Shihua Li, Ning Ma, Wenhua Ding</i>	516
Forward Kinematics of Spherical Parallel Manipulators with Revolute Joints <i>Shaoping Bai</i>	522
Virtual models in the case of calibration of the robots with parallel topology <i>Cornel Brisan</i>	528
Introducing Kinematical Redundancy into Parallel Mechanism with Force Redundancy <i>Kiyoshi Nagai, Zhengyong Liu</i>	534


## WE - 5: Special Robots

An Autonomous Off-Road Robot Based on Integrative Technologies <i>Orlando Hernandez, Yunfeng Wang</i>	540
Are Bigger Robots Scary? -The Relationship Between Robot Size and Psychological Threat- <i>Yutaka Hiroi, Akinori Ito</i>	546
Intelligence Comparison between Fish and Robot using Chaos and Random <i>Jun Hirao</i>	552
Automatic Pipe Negotiation Control for snake-like robot <i>Akina Kuwada, Shuichi Wakimoto, Koichi Suzumori, Yudai Adomi</i>	558
Bipedal Running with Nearly-Passive Flight Phases <i>Qinghong Guo, Chris Macnab, Jeff Pieper</i>	564

## TA - 1: Electromagnetic Devices II

Disposable MagLev Centrifugal Blood Pump Utilizing Cone-Shaped Impeller <i>Wataru Hijikata, Tadahiko Shinshi, Akira Shimokohbe, Hideo Sobajima, Setsuo Takatani</i>	570
Electrode Clamping Force Regulation of Servo Gun Mounted on Resistance Spot Welding Robot <i>Bin Niu, Yonglin Chi, Hui Zhang</i>	576
Lyapunov Stable Control of Tubular Linear Permanent-Magnet Motor <i>Wenyong Li, BinCheng Li</i>	583
Sliding Mode Servo Control with High Pass Notch Filter for Electromagnetic Engine Valve <i>Masaki Uchida, Hideyuki Hasegawa, Ryohei Murata, Yoshifumi Morita, Takao Yabumi</i>	589

## TA - 2: Localization I

 Localizing Objects During Robot SLAM in Semi-Dynamic Environments <i>Hongjun Zhou</i>	595
Localization in Wireless Sensor Networks Using a Mobile Anchor Node <i>Zhen Hu, Dongbing Gu</i>	602
A Large Planar Camera Array For Multiple Automated Guided Vehicles Localization <i>Xuefeng Liang, Yasushi Sumi, Bong Keun Kim, Hyun Min Do, Yong-Shik Kim, Tetsuo Tomizawa, Kenichi Ohara, Tamio Tanikawa, Kohtarō Ohba</i>	608
Discrete Probabilistic Localization of Wireless Sensor Networks <i>Amena Amro, Anis Tabboush, Aleksandra Krsteva, Imad Elhaji</i>	614
Improving Consistency of EKF-based SLAM algorithms by using accurate linear approximation <i>Rongchuan Sun, Shugen Ma, Bin Li, Yuechao Wang</i>	619


## TA - 3: Measurement

Feasibility of Emotion Recognition from Breath Gas Information <i>Kazuhiko Takahashi</i>	625
Wireless Sensor Node for Real-Time Thickness Measurement and Localization of Oil Spills <i>Agop Koulakezian, Rostom Ohannessian, Hovig Denkilian, Milad Chalfoun, Mohamad Khaled Joujou, Ali Chehab, Imad Elhaji</i>	631
Model of Airport Runway Frictional Coefficient Measure Vehicle <i>Xudong Shi</i>	637
Two Dimensional Inductive Encoder for Measuring 2D Displacement <i>Mohammad Reza Karafi, mahmood Ghanbari, Yousef Hojjat</i>	642
In Vivo Estimation of Dynamic Muscle-tendons Moment Arm Lengths Using a Wearable Sensor System <i>Rencheng Zheng</i>	647

## TA - 4: Microactuators

- A Wireless Actuation Method for Micro-robot Moving Inside Pipeline 653  
*Chao Hu, Dongmei Chen, Max Q.-H. Meng*
- Performance Evaluation of a Miniaturized Unconstrained Digital On-Off Switching Valve 659  
*Sumadi Jien, Hirai Shinichi, Kenshin Honda*
- Vibration Control of Self-Sensing Micro Actuators Incorporating Adaptive Mechanisms for Hard Disk Drives 665  
*Kwong Wah Chan*
- A concept for a new Energy Efficient Actuator 671  
*Stefano Stramigioli, Gijs van Oort, Edwin Dertien*


## TA - 5: Nonlinear & Adaptive Control I

-  Trajectory Control for an Autonomous Bicycle with Balancer 676  
*Lycheek Keo, Yamakita Masaki*
- Document Scanner Velocity Command Synthesis Using Time Optimal Command Shaping 682  
*Moeed Mukhtar, Peter Meckl, George Chiu*
- Modeling and Hybrid Control of the Pneumatic Constant Pressure System for Zero Gravity Simulation 688  
*Bo Lu, Guoliang Tao, Zhong Xiang, Wei Zhong*
- Adaptive PID controller based on online LSSVM identification 694  
*Wanfeng Shang, Shengdun Zhao, Yajing Shen*
- New strategy of nonlinear PD controller for hydraulic force system under large variation of load stiffness 699  
*Huayong Yang, Yiming Xu, Wei Sun*


## TP - 1: Piezoelectronic Devices




- Closed-Form Equations for the Vibrations of a Flexure-Based Scott-Russell Mechanism 704  
*Yanling Tian, Bijan Shirinzadeh, Yongmin Zhong, Dawei Zhang*
- A Multiphysics Coupled Model for Active Aerostatic Thrust Bearings 710  
*Gorka Aguirre, Farid Al-Bender, Hendrik Van Brussel*
- Experiments with Coupled Harmonic Oscillators with Local Interaction 716  
*Larry Ballard, Wei Ren*
- Study on a PZT Actuator Based on Pre-stressed Mechanism 722  
*Yi-Cheng Huang, Hsiang-Jung Lin, Jen-Ai Chao*
- Researching on the Characteristic Gas Acquisition and Data Processing System for Power Transformer 728  
*Suxiang Qian*


## TP - 2: Localization II


- A Dynamic Localization Algorithm for Mobile Robots using the iGS system 734  
*SeungKeun Cho, JangMyung Lee, SukChan Shin*
- Particle Filtering for WSN aided SLAM 740  
*Yangming Li*
- Comparison of Robot Localization Methods Using Distributed and Onboard Laser Range Finders 746  
*Drazen Brscic, Hideki Hashimoto*
-  2D Tracking of a Single Paramecium by Using Parallel Level Set Method and Visual Servoing 752  
*Xianfeng Fei, Yasunobu Igarashi, Koichi Hashimoto*



Effects of Overlapping Detection on Ellipsoidal Object Singulation with Live Broiler Handling Applications <i>Kok-Meng Lee, Shaohui Foong, Liu Jones</i>	758
<b>TP - 3: Modeling and Simulation</b>	
Force Modeling with Parameter Estimation for Real Time Force Simulation <i>Chen Zhao, Gerhard Schillhuber, Heinz Ulbrich</i>	764
A Novel Calibration Method for Uncoupling Projector and Camera of a Structured Light System <i>Jiarui Liao, Lilong Cai</i>	770
Panel Adjustment Error of Large Reflector Antennas Considering Electromechanical Coupling <i>Wei Wang, Congsi Wang, Peng Li, Liwei Song</i>	775
Analysis of Imbalance Response of the Rotor-bearing System <i>Honghong Fan, Xiaodong Zhang</i>	780
Research on Tooth Surface Integrality of Cold Rolling Spline <i>F.K. Cui, F.S. Zhang, H.Y. Xu, X.Q. Wang, Y. Li</i>	786
<b>TP - 4: Micor/Nano Devices</b>	
Concept Proposal of a Miniature On-demand Factory and its Efficiency Evaluation <i>Nozomu Mishima, Shinsuke Kondoh, Shizuka Nakano, Kiwamu Ashida, Keijiro Masui</i>	791
MEMS Capacitive Force Sensor for Use in Microassembly <i>Henry Chu, James Mills, William Cleghorn</i>	797
Analytical Model of Electrostatic Fixed-Fixed Microbeam for Pull-in Voltage <i>Lin XieZhao</i>	803
Calibration of Piezoelectric Actuator-based Vision Guided Cell Microinjection System <i>Yanliang Zhang, Mingli Han, Yap Shee Cheng, Wei Tech Ang</i>	808
Development of a Spiral Type of Wireless Microrobot <i>Qinxue Pan, Shuxiang Guo</i>	813
<b>TP - 5: Nonlinear &amp; Adaptive Control II</b>	
 Could Chaotic Dynamics Knock at the Door of Intelligent Control? <i>Yongtao Li, Shuhei Kurata, Kosuke Shigematsu, Yuta Takamura, Shogo Morita, Shigetoshi Nara</i>	819
An Improved Bayesian Optimization Algorithm for Fault Identification on Flight Control System <i>Xiaoxiong Liu, Jingping Shi, Weiguo Zhang, Yan Wu</i>	825
Model Predictive Control of Precision Stages with Nonlinear Friction <i>Seiji Hashimoto</i>	829
Controller Design for a Class of Nonlinear Fuzzy Time-varying Delay Systems <i>Miaoxin Wang, Jizhen Liu, Juncheng Liu</i>	834
Robust Fuzzy Control of A Nonlinear Magnetic Bearing System With Computing Time Delay <i>Kai Zheng, Heng Liu, Lie Yu</i>	839
<b>TE - 1: Assembly</b>	
Assembly Scheduling of Complex Devices with Work Force Optimization <i>Jianhua Yang</i>	844
Effective Component Disassembly Approach for Aircraft Assembly Based on Fuzzy-Clustering Algorithm <i>Kaifu Zhang, Lei Zhao, Yuan Li, Yi Shao</i>	850
Fast Collision Detection Approach to Facilitate Interactive Modular Fixture Assembly Design in VE <i>Gaoliang Peng, Haiquan Yu, Gongdong Wang</i>	856

Development of a Robot Car Wiring System <i>Kyong-mo Koo, Xin Jiang, Atsushi Konno, Masaru Uchiyama</i>	862
Application of Omnidirectional Structure Element of Mathematical Morphology to Wood Computed <i>Lei Yu, Dawei Qi</i>	868
<b>TE - 2: Navigation</b>	
Learning Of Biologically Inspired Behaviors For Autonomous Robots By A Navigational Network <i>Paulo A Jimenez, Bijan Shirinzadeh</i>	874
Mayfly: A Small Mapping Robot for Japanese Office Environments <i>Robert Ouellette, Kotaro Hirasawa</i>	880
VeE: Design and Implementation of a Generic Virtual Environment Engine <i>Lin Shi, Zhiliang Wang, Zhigang Li</i>	886
3D Laser Range Scanner with Hemispherical Field of View for Robot Navigation <i>Julian Ryde, Huosheng Hu</i>	891
 The DSP Based Catcher Robot System with Stereo Vision <i>Chyi-Yeu Lin, Yi-Pin Chiu</i>	897
<b>TE - 3: Hybrid Systems/Control</b>	
A Hybrid External System for the Generation of Biped Locomotion <i>Yingjie Yin, Shigeyuki Hosoe</i>	904
On Acceleration/Deceleration Hybrid Interpolation for Multi-blocks of NURBS curves <i>Hao-Wei Nien, Meng-Shiun Tsai, Hong-Tzong Yau</i>	910
ZMP-based Biped Running Pattern Generation with Contact Transition of Foot <i>Hyeonsik Shin, Ohung Kwon, Dong Hee Kim, Je Sung Yeon, Jong Hyeon Park</i>	916
Impulse / Sliding Mode Hybrid System Modeling of Interacting Rigid Body Systems <i>Reza Pedrami, Brandon Gordon, Ali Akgunduz</i>	922
Research on Mode Tracking of Hybrid Systems <i>Changzheng Liu</i>	928
<b>TE - 4: Micro/Nano Operations</b>	
Inter-nanotube Attogram Mass Transport <i>Lixin Dong, Xinyong Tao, Li Zhang, Xiaobin Zhang, Bradley Nelson</i>	933
Development of the Needle-insertion System for Path-error Correction Using a CMTD(Curved Multi-Tubed Device) <i>Junji Furusho, Takehito Kikuchi, Hidekazu Tanaka, Hiroshi Kobayashi, Tatsuro Yamamoto, Motokazu Terayama, Morito Monden</i>	938
Achieving High-Bandwidth Nanopositioning In Presence of Plant Uncertainties <i>Sumeet Sunil Aphale, Santosh Devasia, S. O. Reza Moheimani</i>	943
Haptic Rendering of Tissue Boundary for Surgical Training <i>Renge Zhou, Dangxiao Wang, Yuru Zhang</i>	949
 Development of Underwater Robot Using Macro Fiber Composite <i>Yoshinori Nagata, Seokyong Park, Aiguo Ming, Makoto Shimojo</i>	955
<b>TE - 5: Nonlinear &amp; Adaptive Control III</b>	
 Adaptive Robust Control of Linear Motor Systems with Dynamic Friction Compensation Using Modified LuGre Model <i>Lu Lu, Bin Yao, Qingfeng Wang, Zheng Chen</i>	961
Modelling, Detection and Control of Slip in Over-Constrained Wheeled Mobile Robots <i>Yuan Ping Li, Marcelo H. Ang, Wei Lin</i>	967

The Grid-side PWM Converter of the Wind Power Generation System Based on Fuzzy Sliding Mode Control <i>Xingjia Yao, Chuanbao Yi, Ying Deng, Jiasi Guo, Yang Lina</i>	973
Construction of Central Pattern Generator for Quadruped Locomotion Control <i>Huashan Feng, Runxiao Wang</i>	979
Robust Stability of Stochastic Genetic Regulatory Networks with Disturbance Attenuation <i>Wei Feng, Simon Yang, Wei Fu, Haixia Wu</i>	985
<b>FA - 1: Mechatronic Applications</b>	
Design of Compact 5-DOF Surgical Robot with Spherical Mechanism: CURES <i>Sung-Kyun Kim, Won-Ho Shin, Seong-Young Ko, Jonathan Kim, Dong-Soo Kwon</i>	990
Testbed for Testing an Active Body Support System for Locomotion Training <i>Ou Ma, Andres Hernandez, Jianxun Liang, Robert Paz</i>	996
Experiment Study on Bonding Tool of Thermosonic Transducer for Flip-Chip Bonding <i>Yi-Cheng Huang, Kun-Yang Li, Chi-Hui Chen</i>	1002
A Battery State of Charge Estimation Method with Extended Kalman Filter <i>Fei Zhang, Guangjun Liu, Lijin Fang</i>	1008
Research on the Authentication Strategy of ASP Mode-based Networked Manufacturing System <i>Wenlan Ying, Aiping Li, Liyun Xu</i>	1014
<b>FA - 2: Humanoid Robots I</b>	
Computer Control System and Walking Pattern Control for a Humanoid Robot <i>Zhangguo Yu, Qiang Huang, Jianxi Li, Xuechao Chen, Weimin Zhang, Kejie Li</i>	1018
 Humanoid Robot Motion Generation for Nailing Task <i>Tepei Tsujita, Atsushi Konno, Shunsuke Komizunai, Yuki Nomura, Takuya Owa, Tomoya Myojin, Yasar Ayaz, Masaru Uchiyama</i>	1024
Consideration of a Human Dynamic Characteristic and Performance Evaluation of an Electric Active Suspension system <i>Shuuichi Buma, Hidenori Kajino, Tsunenori Takahashi, Shun'ichi Doi</i>	1030
The Architecture and Body of FUWA Developmental Humanoid <i>Wenqiang Zhang, Long Lu, Juyang Weng, Xiangyang Xue, Rui Zhang</i>	1037
Motion Separating Based Whole Body Motion Planning For Humanoid Robots Using a Gradient Descent Method <i>Hwan-Joo Kwak, Gwi-Tae Park</i>	1041
<b>FA - 3: Hands/Fingers</b>	
On-line Motion-Feedforward Pose Recognition Invariant for Dynamic Hand-eye motion <i>Wei Song, Mamoru Minami</i>	1047
Automatic Optimal Grasp Planning Based On Found Contact Points <i>Zhixing Xue, J. Marius Zoellner, Ruediger Dillmann</i>	1053
Workspace of Planar Multifingered Manipulation with Full Constraints in Grasps <i>Yisheng Guan, Xianmin Zhang, Hong Zhang</i>	1059
Variable shapes single-tracked of belt type wheel mechanism <i>Jeehong Kim</i>	1065
Development of A Passive Type Dance Partner Robot <i>Zhao Liu, Yoshinori Koike, Takahiro Takeda, Yasuhisa Hirata, Ken Chen, Kazuhiro Kosuge</i>	1070
<b>FA - 4: Fuzzy/Neural I</b>	
Friction Modeling Based on Support Vector Regression Machines and Genetic Algorithms <i>Jin-zhu Zhou</i>	1076

Applications of Evolutionary Programming in Markov Random Field to IR image Segmentation <i>Xiaodong Lu</i>	1082
Fuzzy Decision Method of Part Family Based on Similarity Measures between Vague Sets in FMS <i>Fuzhong Wu</i>	1087
A Novel Method for Design Cases Indexing and Retrieval <i>Xu-tang Zhang, Xin Hou, Tian-guo Jin</i>	1093
A Fast Billet Location Algorithm using Particle Swarm Optimization <i>Wei Chen, Kangling Kang</i>	1098
<b>FA - 5: Control Technology I</b>	
Stability Analysis for Time Delay TLP Systems <i>Chenyuan Chen, Chengwu Chen</i>	1103
Active Flatness Control of Space Membrane Structures Using Discrete Boundary SMA Actuators <i>Xiaoyun Wang, Wanping Zheng, Yan-Ru Hu</i>	1108
Visual Feedback Control of an Overhead Crane and Its Combination with Time-Optimal Control <i>Yasuo Yoshida, Haruhisa Tabata</i>	1114
 Arm Trajectory Planning by Controlling the Direction of End-point Position Error Caused by Disturbance <i>Tasuku Yamawaki, Masahito Yashima</i>	1120
Research into the intelligent control of the cutter head drive system in Shield tunnelling machine based on the pattern recognition <i>Tong Xing, Guofang Gong, Huayong Yang</i>	1126
<b>FP - 1: Aerospace Applications</b>	
Intelligent Micro Probe Robot for Small body Exploration <i>Takashi Kubota, Tetsuo Yoshimitsu</i>	1131
Modeling and Coupling Effects Analysis of a High-speed Aircraft <i>Dongzhu Feng, Xin Wang</i>	1137
Advanced Configuration Generation Technique for the Complex Aircraft Geometry <i>Abdulaziz Azamatov, Jae-Woo Lee, Yung-Hwan Byun, Sang-Ho Kim</i>	1141
Error analysis of rib curves based on measured data of airfoil-wainscot <i>Xiaoqiang Wang, Zhuangde Jiang, Bing Li</i>	1147
Trajectory Planning for Hypersonic Vehicle Using Improved Sparse A* Algorithm <i>Zhongjie Meng, Panfeng Huang, Jie Yan</i>	1152
<b>FP - 2: Humanoid Robots II</b>	
Study of Skating Robot <i>Takahiro Shibata, Kazuo Sato, Toshikazu Takeshita, Shosiro Hatakeyama, Masami Iwase</i>	1158
Hardware Implementation of a Neural Network Controller on FPGA for a Humanoid Robot Arm <i>Jeong-Seob Kim, Seul Jung</i>	1164
Hand Posture Extraction for Object Manipulation of Humanoid Robot BHR-2 <i>Dongyong Jia, Qiang Huang, Ye Tian, Junyao Gao, Weimin Zhang</i>	1170
A Natural Language Instruction System for Humanoid Robots Integrating Situated Speech Recognition, Visual Recognition and On-line Whole-Body Motion Generation <i>Ee Sian Neo, Takeshi Sakaguchi, Kazuhito Yokoi</i>	1176
Analysis of Helical Gait of Snake-like Robot <i>Shumei Yu, Shugen Ma, Bin Li, Yuechao Wang</i>	1183

### FP - 3: Multi - Agents/Robots

Programming a multi-agent system with MASL <i>Duhaut Dominique</i>	1189
Communication Bandwidth Allocation for Decentralized Receding Horizon Control of Multiple Vehicles <i>Hojjat Izadi, Brandon Gordon, Camille Rabbath</i>	1195
The Structure of Personality-based Emotional Decision Making in Robotic Rescue Agent <i>Hamed Shahabazi, Naser Ghasem Aghaei, Abbas Abdolmaleki, Pedram Farzaneh, Ali Khorsandian, Molood Noori</i>	1201
Multi-robot Collaboration Exploration Based on Immune Network Model <i>Hao Wu, Guohui Tian</i>	1207
Human Recognition using RFID System with Multi-Antenna <i>Songmin Jia</i>	1213

### FP - 4: Fuzzy/Neural II

Regenerative-Braking Sliding Mode Control of Electric Vehicle Based on Neural Network Identification <i>Jianbo Cao, Binggang Cao, Peng Xu, Zhifeng Bai</i>	1219
Prediction Servoing to Catch Escaping Fish Using Neural Network <i>Minami Mamoru, Yoshida Toshiaki</i>	1225
Recognition of Wood Defects Based on Artificial Neural Network <i>Hongbo Mu, Dawei Qi</i>	1232
A Modified Particle Swarm Optimizer Based on Cloud Model <i>Jianping Wen, Binggang Cao</i>	1238
Predictive Trajectory Planning of Vectored Thruster Underwater Vehicle with the Use of the Neuron Network <i>Vladimir Filaretov, Dmitry Yukhimets</i>	1242

### FP - 5: Control Technology II

Variable Structure System with the Adaptive Adjustment of Sliding Surfaces <i>Alexander Lebedev, Vladimir Filaretov</i>	1248
Design and Control of an Inverted Pendulum System for Intelligent Mechatronics System Control Education <i>GeunHyung Lee, Seul Jung</i>	1254
Design and Implementation of an Automatic Weighing System Based on CAN Bus <i>Xia Dong, Kedian Wang, Kai Zhao</i>	1260
Placement Process Optimization of Dual-gantry Turret Placement Machine <i>Xuan Du, Zongbin Li</i>	1266

### FE - 1: Advanced Control

An Improved Constrained Robust Model Predictive Control Algorithm for Linear Systems with Polytopic Uncertainty <i>Zhijun Li, yuntao Shi, dehui Sun, lifeng Wang</i>	1272
Non-Linear Multiobjective Optimization for Control of Hydropower Plants Network <i>S. Ali A. Moosavian, Ali Ghafari, Amir Salimi, N Abdi</i>	1278
Optimal Control of an Aerial Robot <i>Payam Zarafshan, S. Bamdad Moosavian, S. Ali A. Moosavian, Mohsen Bahrami</i>	1284
Learning-based Modified Transpose Jacobian Control of Robotic Manipulators <i>Mahmood Karimi, S. Ali A. Moosavian</i>	1290

Wind Turbine Condition Monitoring and Fault Diagnosis using both Mechanical and Electrical signatures <i>Wenxian Yang, Peter Tavner, Michael Wilkinson</i>	1296
<b>FE - 2: Precision Mechatronics</b>	
Minimization of Energy Dissipated in a Ball Screw-nut with All Kinds of Friction <i>Teruyuki Izumi, Masashi Kanesaka, Zuowei Li, Hai Zhou</i>	1302
Water Hydraulics - A Novel Design of Spool-type Valves for Enhanced Dynamic Performance <i>Yousheng Yang, Claudio Semini, Nikos Tsagarakis, Darwin Caldwell, Yuquan Zhu</i>	1308
Linguistic Mechatronics <i>Robin Chhabra, M. Reza Emami</i>	1315
The High Precision-Measurement System of Gyro Rotor's Surface <i>Jian feng Liu</i>	1321
Measurement of Muscle Motion for Improving Accuracy of Body-mounted Motion Sensor <i>Tao Liu, Yoshio Inoue, Kyoko Shibata</i>	1325
<b>FE - 3: Industrial Robots</b>	
Estimation of Abnormalities in a Human Gait Using Sensor-Embedded Shoes <i>Kyounghul Kong, Masayoshi Tomizuka</i>	1331
Modified Transpose Effective Jacobian Control of Underactuated Manipulators <i>Mahmood Karimi, S. Ali A. Moosavian</i>	1337
Design and Modeling of a Lake Surface Cleaning Robot <i>Zhongli Wang, Yunhui Liu, Woody Yip, Biao Peng, Michael Qiao, Shi He</i>	1343
Mobility and Agility Analysis of Walking Robot <i>Jihong Lee, Hyungwon Shim, Doogyu Kim</i>	1349
Lux - An Interactive Receptionist Robot for University Open Days <i>Nicola Bellotto, Susanne Rowland, Huosheng Hu</i>	1355
<b>FE - 4: Fuzzy/Neural III</b>	
A New Neural Network for Robot Path Planning <i>Yongmin Zhong, Bijan Shirinzadeh, Yanlin Tian</i>	1361
Rule-fused Technology for Typical Processes Representation and Automatic Process Decision <i>Lijiang Huang, Shunuan Liu, Xitian Tian, Haicheng Yang</i>	1367
A Modified Differential Evolution Algorithm and Its Application in the Training of BP Neural Network <i>Yuelin Gao, Junmin Liu</i>	1373
Orientation Correction Based Monocular SLAM for a Mobile Robot <i>Haoyao Chen, Dong Sun, Jie Yang, Wen Shang</i>	1378
Controller Parameter Tuning Based on Neural Network Gradient <i>Masanori Sato, Atushi Kanda, Kazuo Ishii</i>	1384
<b>FE - 5: Control Technology III</b>	
Control of bulk modulus of oil in hydraulic systems <i>Jing Wang, Guofang Gong, Huayong Yang</i>	1390
A Self-Adaptive Control Approach for the Attitude of Aircraft with Double-Loop SMC <i>Xutao Luo, Xiaogeng Liang</i>	1396
Hierarchical Modeling Control of A Motorcycle Semi-Active Suspension with Six Degree-Freedoms <i>Long Wu, Yunlu Cao, Hualing Chen</i>	1400
 FPGA-Based Motion Controller with Real-time Look-ahead Function <i>Ming-Tzong Lin, Hong-Tzong Yau, Hao-Wei Nien, Meng-Shiun Tsai</i>	1406

A Novel Router Level Topology Discovery Algorithm <i>zhao honghua</i>	1412
Hand-Written Character Recognition Using MEMS Motion Sensing Technology <i>Shengli Zhou, Zhuxin Dong, Wen J. Li, Chung Ping Kwong</i>	1418