2013 IEEE International Conference on Mechatronics and Automation

(ICMA 2013)

Takamatsu, Japan
4-7 August 2013

Pages 1-872

IEEE Catalog Number: CFP13839-POD
ISBN: 978-1-4673-5559-9

Table of Contents

MA1-1 Mechatronic Application I

A Dynamically Realizable Reconfiguration Strategy for Steering a Spherical Rolling with Two Internal Rotors 1
Mikhail Svinin, Akihiro Morinaga, Motoji Yamamoto

Safe Assembly Motion – A Novel Approach for Applying Human-Robot Co-operation in Hybrid Assembly Systems 7
Yi Shen, Gunther Reinhart

Gait Planning of the Quadruped Walking Chair Robot with Parallel Leg Mechanism 13
Hongbo Wang, Delei Fang, Lingfeng Sang, Yun Wang, Yuehua Wen, Na Chen

Human-inspired Robotic Exoskeleton (HuREx) for Lower Limb Rehabilitation 19
Andrew McDaid, Kazuto Kora, Sheng Xie, Johannes Lutz, Mark Battley

Development of a Articulated Robot with the Direct-teaching Function 25
Taeyong Choi, Yijoon Yoo, Hyunmin Do, Doohyung Kim, Chanhun Park

Multi-Joint Gripper with Differential Gear Chain 30
Takumi Tamamoto, Koichi Koganezawa

MP1-1 Mechatronic Application II

Grasp Stability Analysis of Multiple Objects including Contact Surface Geometry in 3D 36
Takayoshi Yamada, Hidehiko Yamamoto

Path Planning Approach for the Amplification of Electrical Energy Exchange in Multi Axis Robotic Systems 44
Christian Hansen, Jens Kotlarski, Tobias Ortmaier

Dynamic Reconfiguration Manipulability Analysis of Redundant Robot 51
Taoran Feng, Yosuke Kobayashi, Mamoru Minami, Akira Yanou

A Fast 3D Surface Reconstruction Method for Spraying Robot with Time-of-flight Camera 57
Xiaojie Chai, Feng Wen, Xuewei Cao, Kui Yuan

Performance Improvement of Networked Just-In-Time Control for Pneumatic Artificial Muscles 63
Takahiro Kosaki, Rikiya Yamada, Manabu Sano

Inverse Kinematics of a Class of 7R 6-DOF Robots with Non-Spherical Wrist 69
Liao Wu, Xiangdong Yang, Dongjing Miao, Ying Xie, Ken Chen

MP2-1 Mechatronic Design

Design, Analysis and Improvement of a Disc Motor 75
Jianguo Dai, Siqin Chang

Research on Loss and Electromagnetic Heart Coupling of High Speed Permanent Magnet Synchronous Motor 81
Nansha Gao, Lie Yu

The Impact of Pipeline Bend on Bi-directional Pig and the Theories for the Optimal Pig Design 87
Xiaoxiao Zhu, Shimin Zhang, Deguo Wang, Wenming Wang, Shuhai Liu

Research on Energy Recovery for Electric Vehicle based on Motor-Generator Integration System 93
Yi Luo, Dagui Huang, Xiang Gao

Study on the Improvements of Incremental Rolling Process for Spline Shaft with Round Tools based on Finite Element Method 98
Yongyi Li, Shengdun Zhao

Design and Research of Three-Layers Open Architecture Model for Industrial Robot Software System 104
Jian Fang, Jianghai Zhao, Feng He, Xin Lin

MA1-2 Haptic Interface

Dynamic Modeling and Analysis of a 3-DOF Parallel Haptic Device 110
Yili Fu, Yang Yang, Bo Pan, Shuguo Wang

Development of a Tactile Angle Stimuli Presentation Device for Tactile Cognitive Function Discrimination 116
Mohd Usairy Syafiq, Yinghua Yu, Jiajia Yang, Jinglong Wu

The Study of Length Estimation Evoked by Dynamic Vibrotactile Stimuli 122
Juan Wu, Lei Han, Wei Liu, Aiguo Song, Jun Hu

Feasibility Analysis of a Pressure Sensitive Rubber-based Tactile Sensor 129
Jian Guo, Shuxiang Guo, Yue Gao, Wei Wei, Yuehui Ji, Yunliang Wang

Development and Evaluation of Vibrotactile Stimuli Presentation Device to Investigate Tactile Working Memory 135
Yang Liu, Jiajia Yang, Yinghua Yu, Yoshinobu Inai, Jinglong Wu

Performance Evaluation of a Novel Master-slave Rehabilitation System 141
Songyuan Zhang, Shuxiang Guo, Muye Pang

MP1-2 Micro System

Motion Simulator for Coarse and Fine Motion of Combination of a Magnetically Levitated Micro Robot and an Industrial Macro Robot 146
Susumu Tarao, Moein Mehrtash, Naoaki Tsuda, Mir Behrad Khamesee

Development of a 3D-Tesla Micromixer for Bio-Applications 152
An-Shik Yang, Feng-Chao Chuang, Cai-Long Su, Chi-Kuan Chen, Mei-Hui Lee

Design and Estimation of a MCPCB-Flat Plate Heat Pipe for LED Array Module 158
S. C. Shen, H. J. Huang, H. J. Shaw

Microtribological Behavior of Thin Fluorocarbon Film under Water Lubrication 164
Shuhai Liu, Yuexia Han, Yonghe Liu, Shimin Zhang

The Inversion-law in MEMS Microstrip Array Antenna Manufacturing 169
Huanhui Chen, Xiaoming Liu, Quan Hong, Zhenlei Deng, Yefei Li, Xue Zhao, Zhonggan Zhu

High Speed Micro-milling Experiment of Hydrophobic Microstructure 174
Yanling Wan, Xuerui Zhang, Zhanjiang Yu, Jinkai Xu, Huadong Yu

MP2-2 Sensor Design and Sensor Fusion

Selective Precision Motion Control using Weighted Sensor Fusion Approach 179
Kok Kiong Tan, Poi Voon Er, Rui Yang, Chek Sing Teo

Optimized Energy-Latency Cooperative Transmission in Duty-Cycled Wireless Sensor Networks 185
Yu Wang, Shuxiang Guo

A CMOS Optical-Comparator-Based Velocity and Direction Motion Sensor 191
Cheng-Ta Chiang, Ching-Tai Tseng

Dynamic Compensation of Sensors based on Improved Recursive Least Squares Algorithm 196
Yijiang Liu, Shuanghong Liu, Zhenzhen Qin, Zhijie Zhang, Lifan Meng

A CMOS Wind Speed to Frequency Converter with Calibration Circuits 201
Cheng-Ta Chiang, Ji-Yan Lin

Adaptive Streaming Framework for Control and Monitoring Applications 207
Kok Kiong Tan, Rong Wu, Ko Ko Htet Kyaw, Shankar Narayanan Arun, Chiew-Kit Chung

MA1-3 Biological Inspired Robots

Robust Autofocusing in Microscopy using Particle Swarm Optimization 213
Issam M. Bahadur, James K. Mills

Fundamental Analysis for Design and Control of Soft Fish Robots using Piezoelectric Fiber Composite 219
Aiguo Ming, Kazunori Hashimoto, Wenjing Zhao, Makoto Shimojo

Hierarchical Key Frames Extraction for WCE Video 225
Yixuan Yuan, Max Q.-H. Meng

Wearable Stooping-Assist Device in Reducing Risk of Low Back Disorders during Stooped Work 230
Ziguo Luo, Yong Yu

Central Pattern Generators based Control of a Swallowing Device 237
Mingzhu Zhu, Weiliang Xu, Leo K. Cheng, John Bronlund

Characterization and Modeling of a Pneumatic Actuator for a Soft Continuum Robot 243
Gang Chen, Ling Fu, Minh Tu Pham, Tanneguy Redarce

MP1-3 OS33: Bio Assembler for 3D Cellullar System

Improving the Speed of 3D Information Presentation in a Microhabitat 249
Shota Takagi, Kenichi Ohara, Masaru Kojima, Yasushi Mae, Tatsuo Arai

Fabrication of Multilayer Structured Tubular Tissue using Water Transfer Printing 255
Yuka Yamagishi, Taisuke Masuda, Hirofumi Owaki, Fumihito Arai, Michiya Matsusaki, Mitsuru Akashi

Normalization of Flow-in Velocity for Improving the Evaluation on Cell Deformability 261
Chia-Hung Dylan Tsai, Shinya Sakuma, Fumihito Arai, Makoto Kaneko

Automated Construction System for the Fine Lattice Shape Structure using Alginate Gel Fiber 267
Akira Fukushima, Masaru Kojima, Kenichi Ohara, Shun Onozaki, Mitsuhiro Horade, Yasushi Mae, Tatsuo Arai

Assembly Techniques for Artificial Small Diameter Blood Vessel Structures 273
Masahiro Nakajima, Masaru Takeuchi, Yue Tao, Chengzhi Hu, Natsuki Takei, Masumi Yamada, Minoru Seki, Toshio Fukuda

MP2-3 Biomedical System

Research on Cutting Algorithm based on Local Mesh Projection in Virtual Surgery Simulation 279
Xiufen Ye, Jianguo Zhang, Zhenhua Wang, Yuanke Zhang

A Novel Upper Limb Rehabilitation System with Hand Exoskeleton Mechanism 285
Wei Wei, Shuxiang Guo, Fan Zhang, Jian Guo, Yuehui Ji, Yunliang Wang

A Model of Anisotropic Adhesion for Dynamic Locomotion Control 291
Hiroaki Kato

Iterative Local Search with Leap-frog Steps for Job Shop Scheduling Problems 297
Yongming Wang, Hongli Yin

Heart Rate Variability Detector based on Embedded System 302
Shuangye Chen, Liqing Huang, Dongyue Zheng

Stable Gait Planning for a Gecko-inspired Robot to Climb on Vertical Surface 307
Zhiwei Yu, Zhongyuan Wang, Rui Liu, Peng Wang, Zhendong Dai

MA1-4 Control Application I

Robust μ Control and Repetitive Control for Dynamic Tracking Control of a Pneumatic Actuating Table 312
Sheng-Chih Hsu, Chi-Ying Lin

Observer Validation and Model based Control of a Two Mass Oscillator with Backlash 318
Rafael Fietzek, Stephan Rinderknecht

A Novel Control Approach based on Second Order Sliding Modes & Its Application to Hydraulic Drives 324
Lasse Schmidt, Torben O. Andersen, Henrik C. Pedersen

Effects of Roll Dynamics for Car Stability Control by Laguerre Functions 330
Fitri Yakub, Yasuchika Mori

Development and Analysis of a Bilateral Control System for Modular Master-Slave Robots with P-P Tracking Capability 336
Manjia Su, Yisheng Guan, Jie Hu, Pinhong Wu, Haifei Zhu, Xuefeng Zhou, Hong Zhang

Experimental Evaluation of Control Strategies for Hydraulic Servo Robot 342
Michael M. Bech, Torben O. Andersen, Henrik C. Pedersen, Lasse Schmidt

MP1-4 Control Application II

A Fault Detection Algorithm for Turbopump based on Lifting Wavelet and LMS 348
Fuli Zhong, Hui Li, Qian Wu, Tao Hong

Rapidly-Exploring Random Tree based Memory Efficient Motion Planning 354
Olzhas Adiyatov, Huseyin Atakan Varol

Sliding Mode Control of ACV Heading Tracking based on Backstepping 360
Juan Li, Dacheng Song, Zhenye Liu

Robust Trajectory Linearization Control of a Flexible Hypersonic Vehicle in the Presence of Uncertainties 365
Zhiqiang Pu, Xiangmin Tan, Guoliang Fan, Jianqiang Yi

A New Selection Operator to Improve the Performance of Genetic Algorithm for Optimization Problems 371
Amarita Ritthipakdee, Arit Thammano, Nol Premasathian, Bunyarit Uyyanonvara

A Two-Stage Approach based on Genetic Algorithm for Large Size Flow Shop Scheduling Problem 376
Yongming Wang, Hongli Yin

MP2-4 Control Design I

Development of a Piezoelectric-Actuated Drop-On-Demand Droplet Generator using Adaptive Wavelet Neural Network Control Scheme 382
Jin-Wei Liang, Hung-Yi Chen

Robust Control of Systems with RHP Zeros and Poles via Disturbance Observer 389
Emre Sariyildiz, Kouhei Ohnishi

HILS-based Design of Integrative Controller of Parallel-Series HEV 395
Weida Wang, Changle Xiang, Wenjie Ma, Jianzhi Che

SINS Initial Alignment based on Fifth-degree Cubature Kalman Filter 401
Yonggang Zhang, Yulong Huang, Ning Li, Zhemin Wu

Investigation on the Design and Experimental Application of Novel Fatigue Testing Device for Esophagus Stent 407
Xingzhong Gu, Lei Liu, Zhonghua Ni, Jie Cheng, Zhihong Long

Research on the Calibration of FOG based on AFSA 412
Yanbin Gao, Lianwu Guan, Tingjun Wang, Xiaodan Cong

MA1-5 Actuator

Topology Selection and Analysis of Actuator for Seat Valves Suitable for use in Digital Displacement Pumps/Motors 418
Daniel B. Roemer, Per Johansen, Henrik C. Pedersen, Torben O. Andersen

Novel Ultrasonic Motor Driver Design for CubeSat Reaction Wheel 425

Xun Sun, Xiaofeng Wu

Linear Oscillatory Actuator using New Magnetic Movement Converter 431
Fumiya Kitayama, Katsuhiro Hirata, Masahiko Sakai, Tatsuro Yamada

Modeling and Identification of Pneumatic Actuators 437
Yuval Tassa, Tingfan Wu, Javier Movellan, Emanuel Todorov

Experimental Validation of Load Estimation Method from the Back-EMF for Amplitude Control Method of Linear Resonant Actuator 444
Yasuyoshi Asai, Katsuhiro Hirata, Tomohiro Ota

Piezoelectric Micromachined Ultrasonic Transducer Array for Micro Audio Directional Loudspeaker 450
Xuesheng Li, Limei Xu, Ting Sun

MP1-5 Mobile Robot Localization and Tracking

Collective-Adaptive Lévy Flight for Underwater Multi-Robot Exploration 456
Donny Sutantyo, Paul Levi, Christoph Möslinger, Mark Read

Obstacle Avoidance of a Non-holonomic Snake Robot by Tracking a Desired Gliding Curve 463
Yasunobu Hitaka, Masahiro Yokomichi

Square Root Unscented based FastSlam Optimized by Particle Swarm Optimization Passive Congregation 469
Haydar Ankışhan, Emre Öner Tartan, Fikret Arı

A Supervisory Approach for Hazardous Chemical Source Localization 476
Zhenzhang Liu

Optimal Design of Infrared Motion Sensing System using Divide-and-Conquer based Genetic Algorithm 482
Guodong Feng, Yuebin Yang, Xuemei Guo, Guoli Wang

Global Localization of a Mobile Robot in Indoor Environment using Special Frequency Analysis of 2D Range Data 488
Shigeru Bando, Yoshitaka Hara, Takashi Tsubouchi

MP2-5 Mobile Robot Navigation and Path Planning

Path Planning for Mobile Robot on Rough Terrain based on Sparse Transition Cost Propagation in Extended Elevation Maps 494
Takeshi Ohki, Keiji Nagatani, Kazuya Yoshida

Efficient Path Planning with Limit Cycle Avoidance for Mobile Robot Navigation 500
Yu-Lun Ting, Jing-Shi Liu

3D Environmental Mapping of Mobile Robot using a Low-cost Depth Camera 507
Kun Qian, Xudong Ma, Fang Fang, Hong Yang

Environment Modeling and Temporal Mission Planning for Planetary Rover Exploration 513
Peng Wu, Hehua Ju

Potential Guided Directional-RRT* for Accelerated Motion Planning in Cluttered Environments 519
Ahmed Hussain Qureshi, Khawaja Fahad Iqbal, Syeda Madiha Qamar, Fahad Islam, Yasar Ayaz, Naveed Muhammad

Automatic Path Generation and Reactive Behavior for a Wheel Chair 525
Alexandre Luís Cardoso Bissoli, Luis Eduardo Martins de Lima, Marcelo Ardizzon Lovatte

MA1-6 Optimal Design and Simulation

Evaluation of Manipulators based on a Force Accuracy Index Considering Task-Directions 533
Yoshihiro Kai

Discussion on Improving Magnus Effect of Cylinder Based on CFD 539

Jie Zhao, Qingming Hou, Hongzhe Jin, Jihong Yan, Yanhe Zhu, Ge Li

Optimization of Geometry of Annular Seat Valves Suitable for Digital Displacement Fluid Power Pumps/Motors 544
Daniel B. Roemer, Per Johansen, Henrik C. Pedersen, Torben O. Andersen

A New eRobotics Approach: Simulation of Adaptable Joint Admittance Control 550
Eric Guiffo Kaigom, Jürgen Roßmann

Kinematic Optimal Design of a Double-Knuckle Mechanism for Servo Punch Press based on Performance Atlases 556
Yanhua Zhou, Chao Wang, Xinjun Liu

Research on the Kinematic Calibration of a Modular Reconfigurable Robot 562
Xinan Pan, Hongguang Wang, Yong Jiang

MP1-6 Analysis and Simulation

Estimation of Pathological Tremor by using Adaptive Shifting BMFLC based on RLS Algorithm 569
Yongsheng Gao, Shengxin Wang, Jie Zhao, Hegao Cai

Robust Fault-tolerant Compensation Tracking Control for Omni-directional Rehabilitative Training Walker 575
Ping Sun, Shuoyu Wang

Periodic Re-optimization based Dynamic Branch and Price Algorithm for Dynamic Multi-UAV Path Planning 581
Ke Shang, Stephen Karungaru, Zuren Feng, Liangjun Ke, Kenji Terada

Impact Analyzing based on New Method of Phase Space Reconstruction 587
Lijun Zhang, Bin Zhang, Fei He, Jianhong Yang

Research on Reliability Design of ATS based on FTA 593
Yang Ge, Ming Feng, Zhiming Qiu, Liang Xiao

MP2-6 Modeling and Simulation I

A Three-Phase Line Flow Calculation Approach for Distribution Automation 599
Wei-Tzer Huang, Kai-Chao Yao, Chun-Ching Wu

Brittleness Analysis of Complex Systems Subject to Cascading Failure 605
Ran Cao, Hongzhang Jin

Modeling, Identification and Control of a Heavy Duty Industrial Gas Turbine 611
Iman Yousefi, Mostafa Yari, Mahdi Aliyari Shoorehdeli

An Improved Maximum Power Point Tracking for Photovoltaic Grid-Connected Inverter 616
Neng Cao, Jiaoyu Liu

Cascading Failure Evalution of Ship Fire-fighting System 622
Yanli Zhang, Hongzhang Jin, Nuo Jia, Aili Zou

TA1-1 Mechatronic System I

Optimal Reconfiguration of Parallel Manipulators for the Maximum Dynamic Wrench Capability 627
Chun-Ta Chen, Guan-Lin Jin, Chiang-Ho Cheng

Stability and Robustness Analysis of the Position Control Systems with Disturbance Observer 633
Emre Sariyildiz, Kouhei Ohnishi

A Set of Basic Movement Primitives for Anthropomorphic Arms 639
Cheng Fang, Xilun Ding

Artificial Hand based on the Planetary Gear System -Realization of Daily Utility Motion of a Hand with Minimum Actuators- 645
Koichi Koganezawa, Akira Ito

TA2-1 Mechatronic System II

Design of a Multi-Poppet On-Off Valve for Wave Energy Converters 651
Anders Hedegaard Hansen, Henrik C. Pedersen, Torben O. Andersen

SIRO: The Silos Surface Cleaning Robot Concept 657
K. Dandan, A. Ananiev, I. Kalaykov

High Performance Hybrid-Type Magnetic Planetary Gear 662
Noboru Niguchi, Katsuhiro Hirata, Masahiko Sakai

Dimension Optimization of a Planar 3-RRR Parallel Manipulator Considering Motion and Force Transmissibility 670
Yuzhen Chen, Xinjun Liu, Xiang Chen

Deformation and Stress Analysis of Short Flexspline in the Harmonic Drive System with Load 676
Chuang Zou, Tao Tao, Gedong Jiang, Xuesong Mei

Static Performance of Multi-leaf Compliant Gas Foil Journal Bearings with Assembly Preload 681
Wenbo Duan, Yanhua Sun, Haipeng Geng, Chengwei Ding, Weijian Yang, Lie Yu

TP1-1 OS34: Measurements and Control for Mobile Robots

Experimental Considerations on an Attitude Control System with Measurement Noises for an X4-Flyer 686
Keigo Watanabe, Hirotaro Iwabe, Yusuke Ouchi, Isaku Nagai

Quasi-Continuous Exponential Stabilization for the Underactuated Control of a Fire Truck Robot by using an Invariant Manifold Theory 692
Syota Yoshimura, Keigo Watanabe, Shoichi Maeyama

Analyses on On-line Evolutionary Optimization Performance for Pose Tracking while Eye-vergence Visual Servoing 698
Kenta Nishimura, Sen Hou, Koichi Maeda, Mamoru Minami, Akira Yanou

Tip-over Prevention for a Holonomic Omnidirectional Mobile Robot with ADWCs using SGCMG 704
M. Juhairi Aziz Safar, Keigo Watanabe, Shoichi Maeyama, Isaku Nagai

Improvement of Dynamic Characteristics during Transient Response of Force-sensorless Grinding Robot by Force/Position Control 710
Ken Adachi, Mamoru Minami, Akira Yanou

TP2-1 Manipulator Control and Manipulation I

Precise Positioning of Power Lithium Battery Assembly Manipulator Control based on Stepper Motor 716
Yuanqiang Chen, Dagui Huang, Wei Jin, Xiang Gao, Huan Zhang

Robot Motion Evaluation of a Musculoskeletal Robot by Simulation in terms of Energy Flow in the Kinetic Chain 721
Tadashi Asaoka, Ikuo Mizuuchi

Design of a New Experimental Coiled Tubing Injector 727
Yingchun Chen, Shimin Zhang, Wenming Wang, Shuhai Liu, Hengtao Li, Yuexia Han

A Teaching Reform Method for Mechatronics System Engineering 732
Qishen Wang, Peijiang Yuan, Tianmiao Wang, Maozhen Gong

Excitation Control System of DFIG Connected to the Grid on the basis of Similar Signals from Rotor 738
Thang Nguyen Trong, Ban Nguyen Tien, Hai Nguyen Thanh

Research on Bench Testing Technology of ABS Performance based on Magnetic Powder Clutch 743
Kai Zhou, Xudong Wang, Wenliang Jiao

TA1-2 Adaptive and Learning System

Advanced Control for Magnetostrictive Actuated Nano-Stage 749

Xinkai Chen

Stable Robust Adaptive Control of Robotic Manipulators with Switched Constraints 755
Ibrahim F. Jasim, Peter W. Plapper

Adaptive Control of an Omni-directional Walker Considering the Forces Caused by User 761
Renpeng Tan, Kenji Ishida, Shuoyu Wang, Yinlai Jiang, Masakatsu G. Fujie

Adaptive Control of Active Power Filter using RBF Neural Network 767
Juntao Fei, Zhe Wang

TA2-2 Human System Interaction I

A Robotic Auditory System for Imitating Human Listening Behavior 773
Hideyuki Sawada, Chika Udaka

Dynamic Performance Analysis of a Robotic Catheter Manipulating System 779
Xu Ma, Shuxiang Guo

Novel Features Selection for Gender Classification 785
Jiann-Der Lee, Chun-Yi Lin, Chung-Hsien Huang

Integrated Translational and Rotational COG Motion to Enhance the Stability for Humanoid Robots 791
Jing Li, Qiang Huang, Zhangguo Yu, Xuechao Chen, Gan Ma, Si Zhang, Libo Meng, Yingxian Duo

3D Hand Posture Estimation and Task Semantic Monitoring Technique for Human-Robot Collaboration 797
Jhen-Jia Hu, Hui-Chieh Li, Hau-Wei Wang, Jwu-Sheng Hu

Perceiving and Predicting the Intended Motion with Human-Machine Interaction Force for Walking Assistive Exoskeleton Robot 805
Mingyi Yang, Zhigang Xu, Yong Liu, Yun He, Yongli Xu

TP1-2 Human System Interaction II

Analysis of Psychological Stress Factors by using Bayesian Network 811
Kazuhito Sato, Hiroaki Otsu, Hirokazu Madokoro, Sakura Kadowaki

Improving the Performance of Hand Posture Classification by Perimeter Sensor with sEMG 819
Hwiyong Choi, Sangyoon Lee

Basic Research on a Force Display System using Electrorheological Gel 825
Motonari Kanamori, Ken'ichi Koyanagi, Hidenobu Anzai, Koji Sakurai, Yasuhiro Kakinuma, Tatsuo Motoyoshi, Toru Oshima

Characteristic Evaluation of a Wireless Capsule Microrobotic System 831
Shuxiang Guo, Qiang Fu, Yasuhiro Yamauchi, Chunfeng Yue

A New Method on Foot Rolling Trajectory Generation for Human-Like Bipedal Walking 837
Dingsheng Luo, Jianwei Qiu, Yi Wang, Hongshi Huang, Xihong Wu

Neural Network based Adaptive Stability Control Scheme for Teleoperation under Asymmetric Time Delays 843
Yong Liu, Xulong Zhang, Wusheng Chou

TP2-2 Humanoid Robot System

Examination of the Alarm System using Visibility Evaluation of Intersection 849
Hiroto Shirahige, Seunghee Hong, Jun'ichiro Hayashi, Keisuke Suzuki, Tokihiko Akita, Shun'ichi Doi

Design and Implementation of Common Platform for Small Humanoid Robots 855
Ryuki Sato, Hiroaki Matsuda, Motoyuki Fujieda, Hajime Hata, Aiguo Ming

Deformation of the Catheter and 3D Blood Vessel Model for a VR-based Catheter System 861
Shuxiang Guo, Mohan Qu, Baofeng Gao, Jin Guo

Design and Development Part 2 of Dexto:Eka: - The Humanoid Robot 867

Sulabh Kumra, Mayumi Mohan, Sumit Gupta, Himanshu Vaswani

Detail Analysis on Human Bipedalism and a Natural Gait Generation Method for Biped Robots 873
Jiuzhou Zhao, Hehua Ju

TA1-3 OS32: Active Safety Technologies for Traffic Safety

Applicability of Microscopic Shockwave Theory for Evaluating Collision Risk in Vehicle Platoon 879
Hironori Suzuki, Atsushi Kubota

Analysis of Safety Verification Behavior and Classification of Driver's Head Posture 884
Momoyo Ito, Minoru Fukumi, Kazuhito Sato

Research on the Psychosomatic State Transition of a Driver based on a Changing State Hypothesis 890
Shinichi Tachiwana, Seiya Harada, Keisuke Suzuki, Shunichi Doi

A Field Test with Self-Organized Modeling for Knowledge Discovery in a Fleet of City Buses 896
Stefan Byttner, Slawomir Nowaczyk, Rune Prytz, Thorsteinn Rögnvaldsson

TA2-3 Medical Robots I

Walking Assessment in the Phase Space by using Ultra-miniaturized Inertial Measurement Units 902
S. Sessa, K. Saito, M. Zecca, L. Bartolomeo, Z. Lin, S. Cosentino, H. Ishii, T. Ikai, A. Takanishi

Pulse Transit Time Measurement Method with Artifact Tolerance for Home Healthcare 908
Naoto Shiraishi, Yoshiyuki Sankai

A Method of Decreasing Transmission Time of Visual Feedback for the Internet-based Surgical Training System 914
Jin Guo, Shuxiang Guo, Nan Xiao

SEMG-based Continuous Posture Recognition of Elbow Flexion and Extension in Sagittal Plane 920
Zhibin Song, Zhenyu Wang, Shuxiang Guo

Motion Intent Recognition for Control of a Lower Extremity Assistive Device (LEAD) 926
Bingquan Shen, Jinfu Li, Fengjun Bai, Chee-Meng Chew

Study on Resistance Training for Upper-Limb Rehabilitation using an Exoskeleton Device 932
Zhibin Song, Zhenyu Wang, Shuxiang Guo, Baofeng Gao

TP1-3 Medical Robots II

Use of Accelerometers and Gyros for Hip and Knee Angle Estimation 939
Francesco Alonge, Elisa Cucco, Filippo D'Ippolito

First Implementation Results on FAT based Adaptive Control for a Lower Extremity Rehabilitation Device 945
Jinfu Li, Bingquan Shen, Fengjun Bai, Chee-Meng Chew, Chee Leong Teo

A Novel Master-slave Robotic Catheter System for Vascular Interventional Surgery 951
Shuxiang Guo, Peng Wang, Jian Guo, Wei Wei, Yuehui Ji, Yunliang Wang

Design of a Wireless Miniature Low Cost EMG Sensor using Gold Plated Dry Electrodes for Biomechanics Research 957
U. Imtiaz, L. Bartolomeo, Z. Lin, S. Sessa, H. Ishii, K. Saito, M. Zecca, A. Takanishi

Development of a Doctor's Finger Motion Measurement Device for a Remote Catheter Operating System 963
Takao Tanaka, Shuxiang Guo, Nan Xiao

A Kinematic Model of an Upper Limb Rehabilitation Robot System 968
Shuxiang Guo, Wu Zhang, Wei Wei, Jian Guo, Yuehui Ji, Yunliang Wang

TP2-3 Medical Robots III

Design of a Surgeon's Controller for Catheter Navigation 974
Yuan Wang, Nan Xiao, Shuxiang Guo

Motion Characteristic Evaluation of a Catheter Operating System using an Optical Mouse Sensor 979
Xuanchun Yin, Shuxiang Guo, Xu Ma

Ultrasound Guided Automatic Localization of Needle Insertion Site for Epidural Anesthesia 985
Shuang Yu, Kok Kiong Tan, Chengyao Shen, Alex Tiong Heng Sia

Balancing of a Virtual Inverted Pendulum through Internet based on Prediction Method 991
Jianning Hua, Yujie Cui, Xuezhu Wang, Fangping Yang, Yanhua Yang

A Kinematics Method of Automatic Visual Window for Laparoscopic Minimally Invasive Surgical Robotic System 997
Lingtao Yu, Zhengyu Wang, Liqiang Sun, Wenjie Wang, Tao Wang

TA1-4 Control Design II

Speeding-up of Passive Combined Rimless Wheel using Active Wobbling Mass 1003
Fumihiko Asano, Isao Tokuda

Experimental Assessment of an Uncertainty-Bounds Estimator for an Integral Sliding Disturbance Observer 1010
Yu-Sheng Lu, Chien-Wei Chiu

Hierarchical Digital Control of a Proportional Electro-hydraulic Valve 1015
Enrico Canuto, Wilber Acuña-Bravo

Bearings-Only Tracking using Probability Hypothesis Density Filter in Modified Polar Coordinates 1021
Hui Chen, Chongzhao Han

TA2-4 Control Design III

Command-based Iterative Learning Control with TCP Function for Five-axis Contouring 1027
Ming-Tzong Lin, Bing-Huan Tsai, Chien-Yi Lee, Shih-Kai Wu, Hung-Ming Lee

Improving Task Skill Trankfer Method by Acquiring Impedance Parameters from Human Demonstration 1033
Masayuki Shimizu, Yamato Endo, hiromu Onda, Woo-Keun Yoon, Takao Torii

RBF-based Compensation Method on Displacement and Thermal Error 1039
Kok Kiong Tan, Rui Yang, Poi Voon Er, Arthur Tay, Chek Sing Teo

Development of Multi Head Review System using the Planar Stage 1045
Seokho Lee, Hansung Lee, Jongmyung Kim, Beomsu Kim, Soohwa Jung

An Approach for State Observation in Dynamical Systems based on the Twisting Algorithm 1051
Lasse Schmidt, Torben O. Andersen, Henrik C. Pedersen

Automatic Expert System for Fuzzy Control of Robot Trajectory in Joint Space 1057
Liviana Tudor, Adrian Moise

TP1-4 Robot Navigation and Control I

Vanishing Point Detection based on Slope Trend for Omnidirectional Vision-Based Robot Localization 1063
Jun-Yu Yang, Feng-Li Lian

Action Generation of a Biped Robot Climbing Stairs 1069
Qin Zhang, Changxiang Fan, Tao Yao, Yoshitsugu Kamiya

Probabilistic Roadmap with Self-learning for Path Planning of a Mobile Robot in a Dynamic and Unstructured Environment 1074
Yunfei Zhang, Navid Fattahi, Weilin Li

Adaptive PID for Controlling a Quadrotor in a Virtual Outdoor Scenario: Simulation Study 1080
Pisan Moonumca, Yoshio Yamamoto, Nattawoot Depaiwa

A Comparison of Several Nonlinear Filters for Mobile Robot Pose Estimation 1087
Zongwen Xue, Howard Schwartz

A Simple and Robust Binaural Sound Source Localization System using Interaural Time Difference as a Cue 1095
Fumitake Fujii, Nobuhisa Hogaki, Yuko Watanabe

TP2-4 Robot Navigation and Control II

Data Association and Map Management for Robot SLAM using Local Invariant Features 1102
Yin-Tien Wang, Ying-Chieh Feng

Optimization Mechatronic Sun Tracking System Controller's for Improving Performance 1108
Mustafa Engin, Dilşad Engin

Strong Tracking Cubature Kalman Filter Algorithm for GPS/INS Integrated Navigation System 1113
Qiurong Li, Feng Sun

The Design of a Distributed Control System based on CAN Bus 1118
Xiang Gao, Dagui Huang, Yuanqiang Chen, Wei Jin, Yi Luo

Stable Quadruped Walking with the Adjustment of the Center of Gravity 1123
Xian Wu, Xuesong Shao, Wei Wang

The Investigation of the Obstacle Avoidance for Mobile Robot based on Polar Coordinates Vector Method 1129
Dongyue Qu, Jialei Xu, Yuanhang Hu

TA1-5 Mobile Robot System I

Vibration Suppression Control for Multiaxis Table Drive System 1135
Kazuhiro Tsuruta, Tetsuya Ojiro, Nobuhiro Ushimi, Hiroshi Shibata

Measurement of Dynamic Sampling Period of Multi Mobile Robots System with Wireless Communication 1141
Akimasa Otsuka, Fusaomi Nagata, Takahiro Okino

Stabilizer Fin Effect on SWATH Ship Motions and Disturbance Observer based Control Design 1147
Lihua Liang, Baohua Wang, Songtao Zhang, Panpan Xun

A Review of Robotics in Onshore Oil-Gas Industry 1153
Amit Shukla, Hamad Karki

TA2-5 Mobile Robot System II

An Active-caster Drive System for Motorizing a Manual Wheelchair 1161
Yu Munakata, Aki Tanaka, Masayoshi Wada

Differential Flatness-based Motion Control of a Steer-and-Drive Omnidirectional Mobile Robot 1167
Sin-Yi Jiang, Kai-Tai Song

Performance Evaluation on Land of an Amphibious Spherical Mother Robot in Different Terrains 1173
Shuxiang Guo, Maoxun Li, Chunfeng Yue

A Cross Structured Light Sensor for Weld Line Detection on Wall-climbing Robot 1179
Liguo Zhang, Wei Ke, Zhenjun Han, Jianbin Jiao

A Novel Miniature Modular Wire Inspection Robot with Multiple Locomotion Modes 1185
Jingyang Ye, Yisheng Guan, Zhiqiang Bi, Guoqi Zhao, Donghao Luo, Tianliang Liu

ARM based Load and Hook Measuring and Tracking for Precision Hoist of Tower Crane 1191
Yanming Li, Liang Gong, Jiahao Song, Yixiang Huang, Chengliang Liu

TP1-5 Mobile Robot and Application I

Design and Flight Tests of a Holonomic Quadrotor UAV with Sub-Rotor Control Surfaces 1197
Ertugrul Cetinsoy

Multi-Robot Exploration using Potential Games 1203
George Philip, Sidney N. Givigi Jr., Howard M. Schwartz

Fault Detection Algorithm for Legged Walking Robot 1211
Filipp Seljanko

Design and Implementation of UBot: A Modular Self-Reconfigurable Robot 1217
Yanhe Zhu, Jie Zhao, Xindan Cui, Xiaolu Wang, Shufeng Tang, Xueyuan Zhang, Jingchun Yin

A Pruning Robot with a Power-Saving Chainsaw Drive 1223
Yasuhiko Ishigure, Katsuyuki Hirai, Haruhisa Kawasaki

Research on Anti-rollover Stability for Crablike Robot 1229
Gang Wang, Xi Chen, Xiufen Ye

TP2-5 Mobile Robot and Application II

Development of an Indoor Patrol Robot based on Ultrasonic and Vision Data Fusion 1234
Jong-Hann Jean, Jheng-Liang Wang

Mobile YiLan: Enhancing Visitor Experiences in Ubiquitous Computing Environments 1239
Sheng-Chih Chen, Cheng-Ming Huang, Megan F. Liu

Low-Cost Electronic Equipment Architecture Proposal for Urban Search and Rescue Robot 1245
Filipp Seljanko

Research on Trajectory Tracking Behavior in Traction Task for Tractor-Aircraft System 1251
Nengjian Wang, Hongbo Liu

Ultrasonic Transmission Testing of Twin-Robots Coordinated Control 1256
Zongxing Lu, Chunguang Xu, Xinyu Zhao, Lan Zhang, Hongbo Wang, Qinxue Pan

Towards Improving the Efficiency of Sequence-Based SLAM 1261
Yang Liu, Hong Zhang

TA1-6 Modeling and Simulation II

Analysis of the Simultaneous Control of Energy and Actuated Variable of TORA with Pendulum 1267
Kaoru Sumida, Xin Xin, Taiga Yamasaki

Vibration Suppression Control of Geared Mechanical System with Power Circulation Structure: Simulation Study on Effects of Model-based Control Integrated into the Position Control Loop 1273
Masahiko Itoh

Study on Electromechanical Coupling Model of Piezoelectric Ultrasonic Transducer 1279
Pengfei Wang, Junkao Liu, Weishan Chen, Qiang Zhang

Deployment Analysis of a Planar Deployable Support Truss Structure 1287
Dandan Wang, Rongqiang Liu, Yan Wang, Hongwei Guo, Qiang Cong, Congfa Zhang

TA2-6 Signal and Image Processing I

Basic Design of a Computer Vision based Controller for Desktop NC Engraving Machine 1293
Mamadou Ngom, Fusaomi Nagata

High-Speed Multiple Spatial Band-Pass Filtering using a Resistive Network 1299
Shinsuke Yasukawa, Hirotsugu Okuno, Seiji Kameda, Tetsuya Yagi

Temperature Measurement during Resistance Spot Welding using a Digital Camera 1305
Primož Podržaj, Samo Simončič

Turbopump Fault Detection Algorithm based on Protruding Frequency Components RMS and SVM 1311
Tao Hong, Hui Li

Real-time Scene Recognition on Embedded System with SIFT Keypoints and a New Descriptor 1317
Han Xiao, Wenhao He, Kui Yuan, Feng Wen

Hand-eye 3D Pose Estimation for a Drawing Robot 1325
Malik Saad Sultan, Xiaopeng Chen, Gan Ma, Jingtao Xue, Wencheng Ni, Tongtong Zhang, Wen Zhang

TP1-6 Signal and Image Processing II

Basic Study on Step Detection System for the Visually Impaired 1332
Koichi Ishiwata, Mari Sekiguchi, Masataka Fuchida, Akio Nakamura

An Identification and Classification Method for Circular Object based on Rotating Image Template Matching 1338
Jianke Chen, Chao Hu, Xiaoying Yuan, Zhongqing Feng, Houxiang Miao

A Vision-based ICF Target Positioning Method 1344
Wei Song, Yanan Zhang, Linyong Shen, Long Wu

A Vision Measurement Algorithm based on Divergent Facula Structured Light 1350
Haitao Song, Han Xiao, Wenhao He, Feng Wen, Kui Yuan

Adaptive Cubature Particle Filter Algorithm 1356
Qiurong Li, Feng Sun

Real-time SIFT-based Object Recognition System 1361
Zhao Wang, Han Xiao, Wenhao He, Feng Wen, Kui Yuan

TP2-6 Signal and Image Processing III

Dual Image Watermarking Algorithm based on Image Segmentation and Weighted Linear Function Codec Technology 1367
Dacheng Xu, Bailiang Li, Minghui Shi

Mechanical Analysis and Haptic Simulation of the Catheter and Vessel Model for the MIS VR Operation Training System 1372
Baofeng Gao, Kangqi Hu, Shuxiang Guo, Nan Xiao

The Research of Fingervein Feature Extraction based on the Ridgelet Transform 1378
Kejun Wang, Xiaofei Yang, Zheng Tian, Tao Yan

Study on Vibration Mode of Remanufactured Engine based on EEMD 1384
Chengfa Chen, Changku Sun, Xiangbi An, Shumin Li, Zhe Zhang

Passport Photo Compression Technique With JPEG2000 1389
Jun Hou, Ran Li, Yan Cheng, Haojie Shi

Fogery Image Splicing Detection by Abnormal Prediction Features 1394
Jun Hou, Haojie Shi, Yan Cheng, Ran Li

WA1-1 Manipulator Control and Manipulation II

Experimental Studies of Position Control of Humanoid Robot Arms using a Simplified Time-Delayed Controller: A Practical Approach 1399
Y. G. Bae, S. Jung

CYRUS Algorithms for Manipulators Inverse Kinematics 1405
Ali Pyambri Paramani

Design of Intelligent Battery Charger based on SCM Double Closed-loop Control 1413
Wei Luo, Yanbing Yang, Hui Li, Yunhan Jiang

Design and Control of Dual-arm Robot for Cell Manufacturing Process 1419
Hyun Min Do, Chanhun Park, Tae Yong Choi, Jin Ho Kyung

Improved Pattern Search Algorithm based on Optimal Design of Fixture Locator Layout 1424
Hua Guo, Kedian Wang, Zhihui Liu

Optimal Control of Nonlinear System on the Time Series using RBF Network 1429
Yoshihiro Fukuoka, Masao Arakawa

WA2-1 Manipulator Control and Manipulation III

Finger Joint Continuous Interpretation based on sEMG Signals and Muscular Model 1435
Muye Pang, Shuxiang Guo, Songyuan Zhang

Modeling and Static Analysis of a Three-Rigid-Link Object for Nonprehensile Manipulation Planning 1441
Omar Mehrez, Zakarya Zyada, Hossam S. Abbas, Ahmed Abo-Ismail

A Research on Autonomous Position Method for Mobile Robot Manipulator based on Fusion Feature 1447
Mingfang Du, Junzheng Wang, Lipeng Wang, Haiqing Cao, Jianjun Fang, Zongyu Gao, Ji Lv, Shide Zhang

The Development of Nuclear Reactor Core's Full Offset Refueling Algorithm based on Two-dimensional Array 1453
Apeng Zhao, Yuanhao Li

An Algorithm for Serial Planar Manipulators That Have an Architecture R//(n)R by using Solidworks(2013) and Matlab/Simulink(2012) 1458
Brahim Fernini, Mustapha Temmar

Research on Subareas Division Problem of Maritime Search and Rescue based on Improved Monte Carlo Algorithm 1464
Jie Li, Yao Sun, Zhenxing Zhang

WA1-2 Intelligent Control I

Auto-tuning of PID Parameters with Programmable Logic Controller 1469
Dilsad Engin, Mustafa Engin

Inverse Linear Quadratic Regulator of Neutral Systems with Time-Varying Delay 1475
Fukui Ken, Tomohiro Kubo, Hidetoshi Oya

Improving the Vertical Motion of Wave Piercing Catamaran using T-foil 1481
Lihua Liang, Jianlong Jiang, Songtao Zhang

Complex Nonlinear System Identification based on Cellular Particle Swarm Optimization 1486
Yuntao Dai, Liqiang Liu, Jingyi Song

Design of Adaptive Kalman Filter Algorithm in Integrated Navigation System for Land Vehicles 1492
Hongsong Du, Jianhua Cheng, Bingyu Wang

Improved EKF for SOC of the Storage Battery 1497
Dan Xu, Xiaoning Huo, Xin Bao, Changguang Yang, Hui Chen, Binggang Cao

WA2-2 Intelligent Control II

Verification of Archive of Analysis Result and Building Block Effect in Genetic Algorithm 1502
Takuya Hyono, Masao Arakawa

Mobility and Eccentricity Analysis of a Helical Belt Drive In-pipe Robot 1507
Tao Ren, Qingyou Liu, Kai Bao, Yonghua Chen

Ball and Plate Position Control based on Fuzzy Logic with Adaptive Integral Control Action 1513
Yongyut Pattanapong, Chirdpong Deelertpaiboon

Fuzzy Logic based Speed Controller for Permanent-Magnet Synchronous Motor Drive 1518
A. Maamoun, Y. M. Alsayed, A. Shaltout

Tuning of PID Contorller for Diesel Engines using Genetic Algorithm 1523
Naeim Farouk Mohammed, Xiuzhen Ma, Enzhe Song

A Fuzzy-PID Method to Improve the Depth Control of AUV 1528
Bo Hu, Hai Tian, Jiani Qian, Guochao Xie, Linlang Mo, Shuo Zhang

WA1-3 Space and Aerial Robotics

3D Exploration Priority based Flocking of UAVs 1534
Abdullah Al Redwan Newaz, Geunho Lee, Ferdian Adi Pratama, Nak Young Chong

Optimization for Rail-type Climbing Robot in Space 1540
Yongquan Chen, Huihuan Qian, Yangsheng Xu

Design and Analysis of a Triangular Prism Modular Deployable Mast 1546
Minghe Shan, Hongwei Guo, Rongqiang Liu, Yan Wang

An Analytical Inverse Kinematic Solution with the Reverse Coordinates for 6-DOF Manipulators 1552
Li Jiang, Xijian Huo, Yiwei Liu, Hong Liu

Modeling and Control of a Novel Hybrid Ground Aerial Robot 1559
Mahmoud Elsamanty, Mohamed Fanni, Ahmed Ramadan, Ahmed Abo-Ismail

The Ground-based Verification System of Visual Servoing Control for a Space Robot 1566
Minghe Jin, Haitao Yang, Zongwu Xie, Kui Sun, Hong Liu

WA2-3 Underwater and Water Surface System

An Autonomous Underwater Vehicle with a Canard Rudder for Underwater Minerals Exploration 1571
Hiroshi Yoshida, Tadahiro Hyakudome, Shojiro Ishibashi, Takao Sawa, Yoshiyuki Nakano, Hiroshi Ochi, Yoshitaka Watanabe, Takeshi Nakatani, Yutaka Ota, Makoto Sugesawa, Masami Matsuura

ANSYS FLUENT-based Modeling and Hydrodynamic Analysis for a Spherical Underwater Robot 1577
Chunfeng Yue, Shuxiang Guo, Maoxun Li

New Concept of in-water Surface Cleaning Robot 1582
H. Albitar, A. Ananiev, I. Kalaykov

The Development of an Autonomous Underwater Vehicle “Otohime” with the Multiple Operation 1588
Shojiro Ishibashi, Hiroshi Yoshida, Tadahiro Hyakudome, Makoto Sugesawa, Takeshi Nakatani, Yutaka Ota, Hiroshi Ochi, Yoshitaka Watanabe, Takao Sawa, Yoshiyuki Nakano, Takeshi Kumagai, Susumu Sato

Conceptual Design and Preliminary Analysis on Bio-inspired Squid Micro AUV 1594
Muhammad Farid Shaari, Z. Samad, C. J. Jun, Husaini A. B., Ahmad Maliki Omar

WA1-4 Industrial Control and Application I

Network Service Connection Management Mechanism and Network Service Platform 1599
Yi-Hsing Tsai, Wei-Feng Huang, Yun-Ei Wu, Jung-Kuang Hsu

Sound Transmission Loss of Sandwich Polycarbonate Pane in Automobile 1605
Min Shen, Noritoshi Nakagawa

Research on Optimization Technology of the Ship Heading Control Performance 1610
Shuming Yuan, Yao Yao, Honsong Du, Jianhua Cheng

LS-SVM Application for Ship Course Model Predictive Control 1615
Shuqiang Jiang, Fengmei Wei, Hongzhang Jin

Design of Preverifying Serial-Ethernet Communication Gateway based on LM3S8962 1620
Shuangye Chen, Dongyue Zheng, Rujun Yang

WA2-4 Industrial Control and Application II

Integrated Optimization for Supply Chain with Facility Disruption 1625
Yongming Wang, Hongli Yin

Robust H∞ Filter Design for Networked Control Systems with Missing Measurement in Finite-frequency Domain 1630
Xingang Zhao, Dan Ye, Yue Long

Cascading Failure Assessment of Complex Systems based on Bayesian Networks 1636
Nuo Jia, Hongzhang Jin, Yanli Zhang, Aili Zou

Research on Cluster Attack Mission Planning of Multi USVs based on DAM-BBOPSO Algorithm 1641
Jie Li, Yao Sun, Zhenxing Zhang

WA1-5 Industrial Automation I

Synchronous Multipass Spinning with Automatic Calculation of Pass Set 1646
Yoshihiko Sugita, Hirohiko Arai

Enhancing K-means Algorithm for Solving Classification Problems 1652
Arit Thammano, Pannee Kesisung

Zone Divide of Three-Dimensional Model for Spraying Application on Industrial Robot 1657
Xuewei Cao, Feng Wen, Xiaojie Chai, Hao Guo, Kui Yuan

Single-Axis Motion Control of Wind Turbine 1663
Jiancheng Yang, Xinghua Fu

CMAC-based Real-time Calculation of the Effective Welding Current during A.C. Resistance Spot Welding 1669
Zheren Ma, Liang Gong, Yanming Li, Chengliang Liu

Design and Implement of Novel Transverse Flux Switched Magnetic Energy Motor Combined with Control System 1675
Yaxin Li, Hui Li, Ziyan Liu

WA2-5 Industrial Automation II

Online Detection of Deviation in Performance of Multichannel Dynamical Processes 1681
Gancho Vachkov

Dynamic Fault Diagnosis in Chemical Process based on SVM-HMM 1687
Yi Peng, Xiaodan Zhang, Zhenjun Han, Jianbin Jiao

Research on the Sealing Structure of the Plug Near Launcher & Receiver 1692
Wenming Wang, Xutao Mei, Shimin Zhang, Yu Song, Quan Jiao, Yuexia Han

Semi-Anthropomorphic 3D Printed Multigrasp Hand for Industrial and Service Robots 1697
Zhanat Kappassov, Yerbolat Khassanov, Artur Saudabayev, Almas Shintemirov, Huseyin Atakan Varol

Down-hole Robots: Current Status, Challenge and Innovation 1703
Qingyou Liu, Tao Ren, Yujia Li, Yonghua Chen

An Intelligent Object Manipulation Framework for Industrial Tasks 1708
Artur Saudabayev, Yerbolat Khassanov, Almas Shintemirov, Huseyin Atakan Varol

WA1-6 Robot Vision I

Human Detection and Following by a Mobile Robot using 3D Features 1714
Badar Ali, Khawaja Fahad Iqbal, Yasar Ayaz, Naveed Muhammad

An Effective Wavelet-based Scheme for Multi-focus Image Fusion 1720
Lixin Liu, Hongyu Bian, Guofeng Shao

Biological Swimming Mechanism Analysis and Design of Robotic Frog 1726
Jyotsna Pandey, N. S. Reddy, R. Ray, S. N. Shome

A Novel Wavelet Denoising Method used for Droplet Volume Detection in the Microfluidic System 1732
Shuxiang Guo, Fang Wu, Wei Wei, Jian Guo, Yuehui Ji, Yunliang Wang

A Temperature Compensation Algorithm of Piezoresistive Pressure Sensor and Software Implementation 1738
Dacheng Xu, Yongtao Liu

A Fast Stereovision Measurement Algorithm based on SIFT Keypoints for Mobile Robot 1743
Haitao Song, Han Xiao, Wenhao He, Feng Wen, Kui Yuan

WA2-6 Robot Vision II

Skating Motion Analysis of the Amphibious Quadruped 1749
Liwei Shi, Yanlin He, Shuxiang Guo

The Influence of Flanker Interference on Inhibition of Return 1755
Xingjuan Liu, Xiaoyu Tang, Jianzhong Zhou

X-ray Image Mosaic based on Scale Invariant Feature Extraction 1760
Yanwei Wang, Bing Lin, Huadong Sun, Hong Yu

A Novel Feature Extraction Method for sEMG Signals using Image Processing 1765
Shuxiang Guo, Chunhua Guo, Muye Pang

Moving Obstacle Avoidance for the Mobile Robot using the Probabilistic Inference 1771
Hidenori Ishihara, Eiji Hashimoto