

Contents – Part I

Soft, Micro-Nano, Bio-inspired Robotics

Ankle Active Rehabilitation Strategies Analysis Based on the Characteristics of Human and Robotic Integrated Biomechanics Simulation	3
<i>Zhiwei Liao, Zongxin Lu, Chen Peng, Yang Li, Jun Zhang, and Ligang Yao</i>	
Dynamic Drive Performances of the Bionic Suction Cup Actuator Based on Shape Memory Alloy	14
<i>Yunhao Ge, Jihao Liu, Bin Li, Huihua Miao, Weixin Yan, and Yanzheng Zhao</i>	
Piezoelectric Micro-Pump Suction Cup Design and Research on the Optimal Static Driving Characteristics	26
<i>Enguang Guan, Yunhao Ge, Jihao Liu, Weixin Yan, and Yanzheng Zhao</i>	
The Research on the Method of Gait Planning for Biped Robot	39
<i>Pan Li, Kaichao Li, and Yifan Wei</i>	
Control Strategy and Experiment of a Novel Hydraulic-Driven Upper Extremity Exoskeleton	51
<i>Zirong Luo, Guohen Wu, Xing Li, and Jianzhong Shang</i>	
Research on the Locomotion of German Shepherd Dog at Different Speeds and Slopes	63
<i>WeiJun Tian, Qi Zhang, Zhen Yang, Jiyue Wang, Ming Li, and Qian Cong</i>	
Prehension of an Anthropomorphic Metamorphic Robotic Hand Based on Opposition Space Model	71
<i>Guowu Wei, Lei Ren, and Jian S. Dai</i>	
Multi-directional Characterization for Pollen Tubes Based on a Nanorobotic Manipulation System	84
<i>Wenfeng Wan, Yang Liu, Haojian Lu, and Yajing Shen</i>	
A Review on Vibration Characteristics of Carbon Nanotubes and Its Application Via Vacuum	94
<i>Dongliang Huang, Zhan Yang, and Lining Sun</i>	

A Novel Soft Robot Based on Organic Materials: Finite Element Simulation and Precise Control	103
<i>Fanan Wei, Jianghong Zheng, and Changle Yu</i>	
3D Motion Control and Target Manipulation of Small Magnetic Robot	110
<i>Jingyi Wang, Niandong Jiao, Yongliang Yang, Steve Tung, and Lianqing Liu</i>	
A Locomotion Robot Driven by Soft Dielectric Elastomer Resonator.	120
<i>Chao Tang, Bo Li, Changsheng Bian, Zhiqiang Li, Lei Liu, and Hualing Chen</i>	
Design and Test of a New Spiral Driven Pure Torsional Soft Actuator	127
<i>Jihong Yan, Binbin Xu, Xinbin Zhang, and Jie Zhao</i>	
Design of a Soft Pneumatic Actuator Finger with Self-strain Sensing.	140
<i>Yi-Dan Tao and Guo-Ying Gu</i>	
A Programmable Mechanical Freedom and Variable Stiffness Soft Actuator with Low Melting Point Alloy	151
<i>Yufei Hao, Tianmiao Wang, and Li Wen</i>	
Investigate of Grasping Force for a Soft Robot Hand Under Pulling Force and Varying Stiffness	162
<i>Haibin Yin, Qian Li, Junfeng Li, and Mingchang He</i>	
Toward Effective Soft Robot Control via Reinforcement Learning.	173
<i>Haochong Zhang, Rongyun Cao, Shlomo Zilberstein, Feng Wu, and Xiaoping Chen</i>	
The Calibration Method of Humanoid Robot Based on Double Support Constraints	185
<i>Fei Liu and Li Tang</i>	
Rehabilitation Robotics	
Real-Time Collision Avoidance Algorithm for Surgical Robot Based on OBB Intersection Test.	195
<i>Yao Qiu, Zhiyuan Yan, Yu Miao, and Zhijiang Du</i>	
Exploration of a Hybrid Design Based on EEG and Eye Movement	206
<i>Junyou Yang, Yuan Hao, Dianchun Bai, Yinlai Jiang, and Hiroshi Yokoi</i>	
Optimal Design of Electrical Stimulation Electrode for Electrotactile Feedback of Prosthetic Hand	217
<i>Boya Wang, Qi Huang, Li Jiang, Shaowei Fan, Dapeng Yang, and Hong Liu</i>	

A Directional Identification Method Based on Position and Posture of Head for an Omni-directional Mobile Wheelchair Robot	230
<i>Junyou Yang, Chunwei Yu, Rui Wang, and Donghui Zhao</i>	
Design of an Wearable MRI-Compatible Hand Exoskeleton Robot	242
<i>Kun LIU, Yasuhisa Hasegawa, Kousaku Saotome, and Yosiyuki Sainkai</i>	
A Preliminary Study of Upper-Limb Motion Recognition with Noncontact Capacitive Sensing	251
<i>Enhao Zheng, Qining Wang, and Hong Qiao</i>	
Multi-class SVM Based Real-Time Recognition of Sit-to-Stand and Stand-to-Sit Transitions for a Bionic Knee Exoskeleton in Transparent Mode	262
<i>Xiuhua Liu, Zhihao Zhou, Jingeng Mai, and Qining Wang</i>	
EMG-Based Control for Three-Dimensional Upper Limb Movement Assistance Using a Cable-Based Upper Limb Rehabilitation Robot	273
<i>Yao Huang, Ying Chen, Jie Niu, and Rong Song</i>	
A Real-Time Intent Recognition System Based on SoC-FPGA for Robotic Transibial Prosthesis	280
<i>Jingeng Mai, Zhendong Zhang, and Qining Wang</i>	
Motion Planning and Experimental Validation of a Novel Robotic Device for Assistive Gait Training	290
<i>Tao Qin, Hao Zhang, Peijun Liu, Fanjing Meng, and Yanyang Liu</i>	
Impedance Control of a Pneumatic Muscles-Driven Ankle Rehabilitation Robot	301
<i>Chi Zhang, Jiwei Hu, Qingsong Ai, Wei Meng, and Quan Liu</i>	
Gait Recognition Using GA-SVM Method Based on Electromyography Signal	313
<i>Ying Li, Farong Gao, Xiao Zheng, and Haitao Gan</i>	
Estimating 3D Gaze Point on Object Using Stereo Scene Cameras	323
<i>Zhonghua Wan and Caihua Xiong</i>	
Overall Kinematic Coordination Characteristic of Human Lower Limb Movement	330
<i>Bo Huang and Caihua Xiong</i>	
Eye Gaze Tracking Based Interaction Method of an Upper-Limb Exoskeletal Rehabilitation Robot	340
<i>Quanlin Li, Caihua Xiong, and Kai Liu</i>	

Investigation of Phase Features of Movement Related Cortical Potentials for Upper-Limb Movement Intention Detection.	350
<i>Hong Zeng, Baoguo Xu, Huijun Li, Aiguo Song, Pengcheng Wen, and Jia Liu</i>	

Human-Machine Interaction

Mobile Terminals Haptic Interface: A Vibro-Tactile Finger Device for 3D Shape Rendering.	361
<i>Xingjian Zhong, Juan Wu, Xiao Han, and Wei Liu</i>	
Towards Finger Gestures and Force Recognition Based on Wrist Electromyography and Accelerometers.	373
<i>Bo Lv, Xinjun Sheng, Weichao Guo, Xiangyang Zhu, and Han Ding</i>	
Man-Machine Interaction for an Unmanned Tower Crane Using Wireless Multi-Controller	381
<i>Songbo Ruan, Yeping Peng, Guangzhong Cao, Sudan Huang, and Xiangyong Zhong</i>	
Web-Based Human Robot Interaction via Live Video Streaming and Voice. . . .	393
<i>Jiahui Shi, Hongbin Ma, Jialiang Zhao, and Yunxuan Liu</i>	
Object-Shape Recognition Based on Haptic Image	405
<i>Yi Gong, Juan Wu, Miao Wu, and Xiao Han</i>	
Personal Desktop-Level Jet Fighter Simulator for Training or Entertainment . . .	417
<i>Xinye Zhao, Yitao Wang, Wenming Zhang, and Xiaowei Zhang</i>	
Full-Pose Magnetic Estimation Based on a Two-Stage Algorithm for Remote Hand Rehabilitation Training.	428
<i>Hui-Min Shen</i>	
Preprocessing and Transmission for 3D Point Cloud Data	438
<i>Zunran Wang, Chenguang Yang, Zhaojie Ju, Zhijun Li, and Chun-Yi Su</i>	
Dexterous Hand Motion Classification and Recognition Based on Multimodal Sensing	450
<i>Yaxu Xue, Zhaojie Ju, Kui Xiang, Chenguang Yang, and Honghai Liu</i>	
Static Hand Gesture Recognition with Parallel CNNs for Space Human-Robot Interaction	462
<i>Qing Gao, Jinguo Liu, Zhaojie Ju, Yangmin Li, Tian Zhang, and Lu Zhang</i>	
Robust Human Action Recognition Using Dynamic Movement Features	474
<i>Huiwen Zhang, Mingliang Fu, Haitao Luo, and Weijia Zhou</i>	

Static Ankle Joint Stiffness Estimation with Relaxed Muscles Through Customized Device	485
<i>Renjie Xiong, Cheng Sun, Muye Pang, Kui Xiang, and Zhaojie Ju</i>	
IMU Performance Analysis for a Pedestrian Tracker	494
<i>Jianwei Zheng, Minhui Qi, Kui Xiang, and Muye Pang</i>	
A Remote Online Condition Monitoring and Intelligent Diagnostic System for Wind Turbine	505
<i>Detong Kong, Wei Liu, Zhanli Liu, and Hongwei Wang</i>	
Rehabilitation Training for Leg Based on EEG-EMG Fusion	517
<i>Heng Tang, Gongfa Li, Ying Sun, Guozhang Jiang, Jianyi Kong, Zhaojie Ju, and Du Jiang</i>	
A Review of Gesture Recognition Based on Computer Vision	528
<i>Bei Li, Gongfa Li, Ying Sun, Guozhang Jiang, Jianyi Kong, Zhaojie Ju, and Du Jiang</i>	
Hand Gesture Recognition Using Interactive Image Segmentation Method . . .	539
<i>Disi Chen, Gongfa Li, Jianyi Kong, Guozhang Jiang, Ying Sun, Du Jiang, and Zhaojie Ju</i>	
Simulation of 2-DOF Articulated Robot Control Based on Adaptive Fuzzy Sliding Mode Control	551
<i>Feng Du, Gongfa Li, Zhe Li, Ying Sun, Jianyi Kong, Guozhang Jiang, and Du Jiang</i>	
Dynamical System Algorithm Specification Analysis and Stabilization.	560
<i>Charles C. Phiri, János Botzheim, Cristina Valle, Zhaojie Ju, and Honghai Liu</i>	
A Review of Upper and Lower Limb Rehabilitation Training Robot	570
<i>Wenlong Hu, Gongfa Li, Ying Sun, Guozhang Jiang, Jianyi Kong, Zhaojie Ju, and Du Jiang</i>	
External Force Detection for Physical Human-Robot Interaction Using Dynamic Model Identification.	581
<i>Dewen Wu, Quan Liu, Wenjun Xu, Aiming Liu, Zude Zhou, and Duc Truong Pham</i>	
Mechanical Design and Human-Machine Coupling Dynamic Analysis of a Lower Extremity Exoskeleton	593
<i>Bo Li, Bo Yuan, Jun Chen, Yonggang Zuo, and Yifu Yang</i>	
Intention-Based Human Robot Collaboration	605
<i>Guoqiang Liang, Xuguang Lan, Hanbo Zhang, Xingyu Chen, and Nanning Zheng</i>	

Swarm Robotics

A Knowledge-Based Intelligent System for Distributed and Collaborative Choreography	617
<i>Xinle Du, Haoqin Ma, and Hongwei Wang</i>	
Distributed Consensus Control of Multi-USV Systems	628
<i>Bin Liu, Hai-Tao Zhang, Yue Wu, and Binbin Hu</i>	
Distributed Event-Triggered Consensus Control of Neutrally Stable Linear Multi-agent Systems	636
<i>Bin Cheng and Zhongkui Li</i>	
Approximate Dynamic Programming for Relay Deployment in Multi-robot System	648
<i>Song Yao, Yunlong Wu, and Bo Zhang</i>	
GSDf: A Generic Development Framework for Swarm Robotics	659
<i>Xuefeng Chang, Zhongxuan Cai, Yanzhen Wang, Xiaodong Yi, and Nong Xiao</i>	
A Case Study on the Performance of Gazebo with Multi-core CPUs	671
<i>Hai Yang and Xuefei Wang</i>	
CNP Based Satellite Constellation Online Coordination Under Communication Constraints	683
<i>Guoliang Li, Lining Xing, and Yingwu Chen</i>	

Underwater Robotics

Research on Fault-Tolerant Control Method of UUV Sensor Using Walcott-Zak Observer	699
<i>Zheping Yan, Yingming Bi, and Tao Chen</i>	
The Tracking Control of Unmanned Underwater Vehicles Based on QPSO-Model Predictive Control	711
<i>Wenyang Gan, Daqi Zhu, Bing Sun, and Chaomin Luo</i>	
Motion Analysis of Wave Glider Based on Multibody Dynamic Theory	721
<i>Xiao-tao Li, Fang Liu, Li Wang, and Hu-qing She</i>	
Distributed Formation Control of Autonomous Underwater Vehicles Based on Flocking and Consensus Algorithms	735
<i>Wuwei Pan, Dapeng Jiang, Yongjie Pang, Yuda Qi, and Daichao Luo</i>	
Pitch Angle Active Disturbance Rejection Control with Model Compensation for Underwater Glider.	745
<i>Dalei Song, Tingting Guo, Hongdu Wang, Zhijian Cui, and Liqin Zhou</i>	

Numerical Simulation Research in Flow Fields Recognition Method Based on the Autonomous Underwater Vehicle	757
<i>Xinghua Lin, Jianguo Wu, Dong Liu, and Lili Wang</i>	
Trajectory-Keeping Control of AUV Based on RNM-ADRC Method Under Current Disturbances for Terrain Survey Mission	766
<i>Tao Chen, Hang Gao, Da Xu, Chuang Wan, Yuzhu Wang, and Zheping Yan</i>	
UUV-Six Degrees of Freedom Positioning Method Based on Optical Vision	779
<i>Wei Zhang, Ximeng Wang, Lifeng Gao, and Shilin Wei</i>	
Hydrographic and Meteorological Observation Demonstration with Wave Glider “Black Pearl”	790
<i>Can Li, Hongqiang Sang, Xiujun Sun, and Zhanhui Qi</i>	
Simulation for Path Planning of OUC-II Glider with Intelligence Algorithm	801
<i>Yuhai Liu, Xin Luan, Dalei Song, and Zhiqiang Su</i>	
The Summary of Underwater Gliders Control Strategies.	813
<i>Yuhai Liu, Xin Luan, Dalei Song, and Zhiqiang Su</i>	
System Construction for Distributedly Controlling the Thrusters of X4-AUV	825
<i>Xiongshi Xu, Keigo Watanabe, and Isaku Nagai</i>	
A Localization Method Using a Dynamical Model and an Extended Kalman Filtering for X4-AUV	834
<i>Keigo Watanabe, Takanori Yamaguchi, and Isaku Nagai</i>	
Experiment Study of Propulsion Property of Marine Mobile Buoy Driven by Wave	846
<i>Zongyu Chang, Guiqiao Lu, Guangchao Du, Zhongqiang Zheng, Yuanguang Tang, Jiliang Wang, and Xin Lu</i>	
Design of Thermal Power Generation System Based on Underwater Vehicles.	857
<i>Rui Wang, Hongwei Zhang, Guohui Wang, and Zhesong Ma</i>	
Design and Simulation of a Self-adaptive Fuzzy-PID Controller for an Autonomous Underwater Vehicle.	867
<i>Jianhong Zhao, Wei Yi, Yuanxi Peng, and Xuefeng Peng</i>	
Author Index	879

Contents – Part II

Industrial Robot and Robot Manufacturing

An NC Code Based Machining Movement Simulation Method for a Parallel Robotic Machine	3
<i>Xu Shen, Fugui Xie, Xin-Jun Liu, and Rafiq Ahmad</i>	
Trajectory and Force Generation with Multi-constraints for Robotic Belt Grinding	14
<i>Yangyang Mao, Huan Zhao, Xin Zhao, and Han Ding</i>	
Fractional-Order Integral Sliding Mode Controller for Biaxial Motion Control System	24
<i>Xi Yu, Huan Zhao, Xiangfei Li, and Han Ding</i>	
Pose Estimation with Mismatching Region Detection in Robot Bin Picking	36
<i>Zhe Wang, Lei Jia, Lei Zhang, and Chungang Zhuang</i>	
A Five-Degree-of-Freedom Hybrid Manipulator for Machining of Complex Curved Surface	48
<i>Yundou Xu, Jianhua Hu, Dongsheng Zhang, Jiantao Yao, and Yongsheng Zhao</i>	
A Dynamic Real-Time Motion Planning Method for Multi-robots with Collision Avoidance	59
<i>Yonghong Zhang, Huan Zhao, Congcong Ye, and Han Ding</i>	
Reverse and Forward Post Processors for a Robot Machining System	70
<i>Fusaomi Nagata, Yudai Okada, Takamasa Kusano, and Keigo Watanabe</i>	
Research on Robot Grinding Technology Considering Removal Rate and Roughness	79
<i>Shaobo Xie, Shan Li, Bing Chen, and Junde Qi</i>	
Electromechanical Coupling Dynamic Model and Speed Response Characteristics of the Flexible Robotic Manipulator	91
<i>Yufei Liu, Bin Zi, Xi Zhang, and Dezhong Xu</i>	
Correction Algorithm of LIDAR Data for Mobile Robots	101
<i>Wenzhi Bai, Gen Li, and Liya Han</i>	

Research and Application on Avoiding Twist Mechanism Based on Relative Rotation Platforms	111
<i>Guobin Yang, Lubin Hang, Jiuru Lu, Zhiyu Fu, Wentao Li, and Liang Yu</i>	
Optimal Motion Planning for Mobile Welding Robot.	124
<i>Gen Pan, Enguang Guan, Fan Yang, Anye Ren, and Peng Gao</i>	
Off-Line Programmed Error Compensation of an Industrial Robot in Ship Hull Welding	135
<i>Guanglei Wu, Delun Wang, and Huimin Dong</i>	
Study and Experiment on Positioning Error of SCARA Robot Caused by Joint Clearance.	147
<i>Changyu Xu, Huimin Dong, Shangkun Xu, Yu Wu, and Chenggang Wang</i>	
Real-Time Normal Measurement and Error Compensation of Curved Aircraft Surface Based on On-line Thickness Measurement	157
<i>Yuan Yuan, Qingzhen Bi, Limin Zhu, and Han Ding</i>	
Feasibility of the Bi-Directional Scanning Method in Acceleration/deceleration Feedrate Scheduling for CNC Machining	171
<i>Jie Huang, Xu Du, and Li-Min Zhu</i>	
A Feed-Direction Stiffness Based Trajectory Optimization Method for a Milling Robot.	184
<i>Gang Xiong, Ye Ding, and LiMin Zhu</i>	

Mechanism and Parallel Robotics

Kinematic Analysis and Performance Evaluation of a Redundantly Actuated Hybrid Manipulator	199
<i>Lingmin Xu, Qiaohong Chen, Leiying He, and Qinchuan Li</i>	
Topology Optimization of the Active Arms for a High-Speed Parallel Robot Based on Variable Height Method.	212
<i>Qizhi Meng, Fugui Xie, and Xin-Jun Liu</i>	
Stiffness Analysis of a Variable Stiffness Joint Using a Leaf Spring	225
<i>Lijin Fang and Yan Wang</i>	
Design of a Series Variable Stiffness Joint Based on Antagonistic Principle . . .	238
<i>Shipeng Cui, Yiwei Liu, Yongjun Sun, and Hong Liu</i>	
Two-Degree-of-Freedom Mechanisms Design Based on Parasitic Motion Maximization	250
<i>Zhenyang Zhuo, Yunjiang Lou, Bin Liao, and Mingliang Wang</i>	

Novel Design of a Family of Legged Mobile Lander	261
<i>Rongfu Lin and Weizhong Guo</i>	
Designing of a Passive Knee-Assisting Exoskeleton for Weight-Bearing	273
<i>Bo Yuan, Bo Li, Yong Chen, Bilian Tan, Min Jiang, Shuai Tang, Yi Wei, Zhijie Wang, Bin Ma, and Ju Huang</i>	
Development of HIT Humanoid Robot	286
<i>Baoshi Cao, Yikun Gu, Kui Sun, Minghe Jin, and Hong Liu</i>	
Design of a Robotic Laparoscopic Tool with Modular Actuation.	298
<i>Kai Xu, Huichao Zhang, Jiangran Zhao, and Zhengchen Dai</i>	
Preliminary Development of a Continuum Dual-Arm Surgical Robotic System for Transurethral Procedures	311
<i>Kai Xu, Bo Liang, Zhengchen Dai, Jiangran Zhao, Bin Zhao, Huan Liu, Liang Xiao, and Yinghao Sun</i>	
Optimal Design of a Cable-Driven Parallel Mechanism for Lunar Takeoff Simulation	323
<i>Yu Zheng, Wangmin Yi, and Fanwei Meng</i>	
Optimal Design of an Orthogonal Generalized Parallel Manipulator Based on Swarm Particle Optimization Algorithm.	334
<i>Lei Peng, Zhizhong Tong, Chongqing Li, Hongzhou Jiang, and Jingfeng He</i>	
Research on a 3-DOF Compliant Precision Positioning Stage Based on Piezoelectric Actuators	346
<i>Guang Ren, Quan Zhang, Chaodong Li, and Xu Zhang</i>	
Analysis for Rotation Orthogonality of a Dynamically Adjusting Generalized Gough-Stewart Parallel Manipulator.	359
<i>ZhiZhong Tong, Tao Chen, Lei Peng, Hongzhou Jiang, and Fengjing He</i>	
A Delta-CU – Kinematic Analysis and Dimension Design	371
<i>Jiayu Li, Huiping Shen, Qinmei Meng, and Jiaming Deng</i>	
Research on the Synchronous Control of the Pneumatic Parallel Robot with Two DOF	383
<i>Shaoning Wang, Tao Wang, Bo Wang, and Wei Fan</i>	
Analysis on Rigid-Elastic Coupling Characteristics of Planar 3-RRR Flexible Parallel Mechanisms	394
<i>Qinghua Zhang and Qinghua Lu</i>	

Advanced Parallel Robot with Extended RSUR Kinematic for a Circulating Working Principle	405
<i>Stefan Tobias Albrecht, Hailin Huang, and Bing Li</i>	
Design and Analysis of a New Remote Center-of-Motion Parallel Robot for Minimally Invasive Surgery	417
<i>Jingyuan Sun, Shuo Wang, Hongjian Yu, and Zhijiang Du</i>	
Accuracy Synthesis of a 3-R2H2S Parallel Robot Based on Rigid-Flexible Coupling Mode	429
<i>Caidong Wang, Yihao Li, Yu Ning, Liangwen Wang, and Wenliao Du</i>	
A Singularity Analysis Method for Stewart Parallel Mechanism with Planar Platforms	441
<i>Shili Cheng, Guihua Su, Xin Xiong, and Hongtao Wu</i>	
Performance Research of Planar 5R Parallel Mechanism with Variable Drive Configurations	453
<i>Weitao Yuan, Zhaokun Zhang, Zhufeng Shao, Liping Wang, and Li Du</i>	
Experimental Study on Load Characteristics of Macro-Micro Dual-Drive Precision Positioning Mechanism	464
<i>Jing Yu, Ruizhou Wang, and Xianmin Zhang</i>	

Machine and Robot Vision

Solving a New Constrained Minimization Problem for Image Deconvolution	475
<i>Su Xiao, Ying Zhou, and Linghua Wei</i>	
An Object Reconstruction Method Based on Binocular Stereo Vision	486
<i>Yu Liu, Chao Li, and Jixiang Gong</i>	
A New Method of Determining Relative Orientation in Photogrammetry with a Small Number of Coded Targets	496
<i>Hao Wu, Xu Zhang, and Limin Zhu</i>	
A Camera Calibration Method Based on Differential GPS System for Large Field Measurement	508
<i>Haijun Jiang and Xiangyi Sun</i>	
A New Pixel-Level Background Subtraction Algorithm in Machine Vision	520
<i>Songsong Zhang, Tian Jiang, Yuanxi Peng, and Xuefeng Peng</i>	
A New Chessboard Corner Detection Algorithm with Simple Thresholding	532
<i>Qi Zhang and Caihua Xiong</i>	

FPGA-Based Connected Components Analysis Algorithm Without Equivalence-Tables	543
<i>Luxiang Ling, Zhong Chen, Shuai Li, and Xianmin Zhang</i>	
A Methodology to Determine the High Performance Area of 6R Industrial Robot.	554
<i>Nianfeng Wang, Zhifei Zhang, and Xianmin Zhang</i>	
Recognition of Initial Welding Position Based on Structured-Light for Arc Welding Robot	564
<i>Nianfeng Wang, Xiaodong Shi, and Xianmin Zhang</i>	
A Dual-Camera Assisted Method of the SCARA Robot for Online Assembly of Cellphone Batteries.	576
<i>Kai Feng, Xianmin Zhang, Hai Li, and Yanjiang Huang</i>	
A Fast 3D Object Recognition Pipeline in Cluttered and Occluded Scenes . . .	588
<i>Liupo Zheng, Hesheng Wang, and Weidong Chen</i>	
Implementation of Multiple View Approach for Pose Estimation with an Eye-In-Hand Robotic System	599
<i>Kai Li, Chungang Zhuang, Jianhua Wu, and Zhenhua Xiong</i>	
Research on Extracting Feature Points of Electronic-Component Pins	611
<i>Yongcong Kuang, Jiayu Li, Jinglun Liang, and Gaoferi Ouyang</i>	
Efficient Combinations of Rejection Strategies for Dense Point Clouds Registration.	623
<i>Shaoan Zhao, Lin Zuo, Chang-Hua Zhang, and Yu Liu</i>	
Reconstructing Dynamic Objects via LiDAR Odometry Oriented to Depth Fusion	634
<i>Hui Cheng, Yongheng Hu, Haoguang Huang, Chuangrong Chen, and Chongyu Chen</i>	
A Robot Teaching Method Based on Motion Tracking with Particle Filter . . .	647
<i>Yanjiang Huang, Jie Xie, Haopeng Zhou, Yanglong Zheng, and Xianmin Zhang</i>	
Self Calibration of Binocular Vision Based on Bundle Adjustment Algorithm	659
<i>Duo Xu, Yunfeng Gao, and Zhenghua Hou</i>	
Statistical Abnormal Crowd Behavior Detection and Simulation for Real-Time Applications	671
<i>Wilbert G. Aguilar, Marco A. Luna, Hugo Ruiz, Julio F. Moya, Marco P. Luna, Vanessa Abad, and Humberto Parra</i>	

Driver Fatigue Detection Based on Real-Time Eye Gaze Pattern Analysis . . .	683
<i>Wilbert G. Aguilar, Jorge I. Estrella, William López, and Vanessa Abad</i>	
Onboard Video Stabilization for Rotorcrafts	695
<i>Wilbert G. Aguilar, David Loza, Luis Segura, Alexander Ibarra, Thomas Abaroa, and Ronnie Fuertes</i>	
Evolutionary People Tracking for Robot Partner of Information Service in Public Areas	703
<i>Wei Quan and Naoyuki Kubota</i>	
Robot Grasping and Control	
Study on the Static Gait of a Quadruped Robot Based on the Body Lateral Adjustment	717
<i>Qingsheng Luo, Bo Gao, and Rui Zhao</i>	
Analyses of a Novel Under-Actuated Double Fingered Dexterous Hand.	727
<i>Rui Feng and Yifan Wei</i>	
LIPSAY Hand: A Linear Parallel and Self-adaptive Hand with Y-Shaped Linkage Mechanisms	739
<i>Jian Hu, Ke Li, Wenzeng Zhang, Xiangrong Xu, and Aleksandar Rodic</i>	
A Novel Parallel and Self-adaptive Robot Hand with Triple-Shaft Pulley-Belt Mechanisms.	752
<i>Qingyuan Jiang, Shuang Song, and Wenzeng Zhang</i>	
A Novel Robot Finger with a Rotating-Idle Stroke for Parallel Pinching and Self-adaptive Encompassing	764
<i>Jingchen Qi, Linan Dang, and Wenzeng Zhang</i>	
Remote Live-Video Security Surveillance via Mobile Robot with Raspberry Pi IP Camera	776
<i>Xiaolong Jing, Changyang Gong, Zhenyu Wang, Xudong Li, and Zhao Ma</i>	
Dynamic Identification for Industrial Robot Manipulators Based on Glowworm Optimization Algorithm	789
<i>Li Ding, Wentao Shan, Chuan Zhou, and Wanqiang Xi</i>	
A Method of Computed-Torque Deviation Coupling Control Based on Friction Compensation Analysis	800
<i>Yao Yan, Le Liang, Yanyan Chen, Yue Wang, and Yanjie Liu</i>	
Fuzzy PD-Type Iterative Learning Control of a Single Pneumatic Muscle Actuator	812
<i>Da Ke, Qingsong Ai, Wei Meng, Congsheng Zhang, and Quan Liu</i>	

Cascade Control for SEAs and Its Performance Analysis	823
<i>Yuancan Huang, Yin Ke, Fangxing Li, and Shuai Li</i>	
One of the Gait Planning Algorithm for Humanoid Robot Based on CPG Model	835
<i>Liqing Wang, Xun Li, and Yanduo Zhang</i>	
Design of an Active Compliance Controller for a Bionic Hydraulic Quadruped Robot	846
<i>Xiaoxing Zhang, Xiaoqiang Jiang, Xin Luo, and Xuedong Chen</i>	
Motion Control Strategy of Redundant Manipulators Based on Dynamic Task-Priority	856
<i>Weiyao Bi, Xin-Jun Liu, Fugui Xie, and Wan Ding</i>	
A Boundary Control Method for Suppressing Flexible Wings Vibration of the FMAV	869
<i>Yunan Chen, Wei He, Xiuyu He, Yao Yu, and Changyin Sun</i>	
Proxy Based Sliding Mode Control for a Class of Second-Order Nonlinear Systems	879
<i>Guangzheng Ding, Jian Huang, and Yu Cao</i>	
Numerical Methods for Cooperative Control of Double Mobile Manipulators	889
<i>Víctor H. Andaluz, María F. Molina, Yaritza P. Erazo, and Jessica S. Ortiz</i>	
Author Index	899

Contents – Part III

Sensors and Actuators

Modeling of Digital Twin Workshop Based on Perception Data	3
<i>Qi Zhang, Xiaomei Zhang, Wenjun Xu, Aiming Liu, Zude Zhou, and Duc Truong Pham</i>	
A Stable Factor Approach of Input-Output-Based Sliding-Mode Control for Piezoelectric Actuators with Non-minimum Phase Property	15
<i>Haifeng Ma, Jianhua Wu, and Zhenhua Xiong</i>	
Design of Quadrotor Unmanned Aerial Vehicle	25
<i>Mofei Wu, Zhigang Cheng, Lin Yang, and Lamei Xu</i>	
Dust Detection System Based on Capacitive Readout IC MS3110.	35
<i>Xiaoqin Tong</i>	
Design and Modeling of a Compact Rotary Series Elastic Actuator for an Elbow Rehabilitation Robot	44
<i>Qiang Zhang, Benyan Xu, Zhao Guo, and Xiaohui Xiao</i>	
A Vibro-tactile Stimulation and Vibro-signature Synchronization Device for SSSEP-Based Study	57
<i>Huanpeng Ye, Tao Xie, Lin Yao, Xinjun Sheng, and Xiangyang Zhu</i>	
Improved Indoor Positioning System Using BLE Beacons and a Compensated Gyroscope Sensor.	69
<i>Jae Heo and Younggoo Kwon</i>	
Stretchable sEMG Electrodes Conformally Laminated on Skin for Continuous Electrophysiological Monitoring	77
<i>Wentao Dong, Chen Zhu, Youhua Wang, Lin Xiao, Dong Ye, and YongAn Huang</i>	
Isotropy Analysis of a Stiffness Decoupling 8/4-4 Parallel Force Sensing Mechanism.	87
<i>Jiantao Yao, Danlin Wang, Xueyan Lin, Hong Zhang, Yundou Xu, and Yongsheng Zhao</i>	
Preliminary Results of EMG-Based Hand Gestures for Long Term Use	98
<i>Peter Boyd, Yinfeng Fang, and Honghai Liu</i>	

Research on Variable Stiffness and Damping Magnetorheological Actuator for Robot Joint	109
<i>Xiaomin Dong, Weiqi Liu, Xuhong Wang, Jianqiang Yu, and Pinggen Chen</i>	
Physical Field-Enhanced Intelligent Space with Temperature-Based Human Motion Detection for Visually Impaired Users	120
<i>Jiaoying Jiang, Kok-Meng Lee, and Jingjing Ji</i>	
Optimal Design and Experiments of a Wearable Silicone Strain Sensor	130
<i>Tao Mei, Yong Ge, Zhanfeng Zhao, Mingyu Li, and Jianwen Zhao</i>	
Mobile Robotics and Path Planning	
Research and Implementation of Person Tracking Method Based on Multi-feature Fusion	141
<i>Fang Fang, Kun Qian, Bo Zhou, and Xudong Ma</i>	
Method and Experiment of the NAO Humanoid Robot Walking on a Slope Based on CoM Motion Estimation and Control.	154
<i>Qingdan Yuan, Zhigang Xi, Qinghua Lu, and Zhihao Lin</i>	
TVSLAM: An Efficient Topological-Vector Based SLAM Algorithm for Home Cleaning Robots.	166
<i>Yongfu Chen, Chunlei Qu, Qifu Wang, Zhiyong Jin, Mengzhu Shen, and Jiaqi Shen</i>	
Development of Wall-Climbing Robot Using Vortex Suction Unit and Its Evaluation on Walls with Various Surface Conditions.	179
<i>Jianghong Zhao and Xin Li</i>	
Motion Planning and Simulation of Multiple Welding Robots Based on Genetic Algorithm	193
<i>Yongsheng Chao and Wenlei Sun</i>	
Leader-Follower Formation Control Based on Artificial Potential Field and Sliding Mode Control	203
<i>Xu Wang, Hong-an Yang, Haojie Chen, Jinguo Wang, Luoyu Bai, and Wenpei Zan</i>	
Trajectory Tracking by Terminal Sliding Mode Control for a Three-Wheeled Mobile Robot	215
<i>Jia-Xin Shao, Yu-Dong Zhao, Dong-Eon Kim, and Jang-Myung Lee</i>	
Research and Development of Ball-Picking Robot Technology	226
<i>Hengbin Yu, Shoujun Wang, Haibo Zhou, Lu Yang, and Xu Zhou</i>	

Mobile Indoor Localization Mitigating Unstable RSS Variations and Multiple NLOS Interferences	237
<i>Kyuchang Kwon and Younggoo Kwon</i>	
The Integrated Indoor Positioning by Considering Spatial Characteristics	246
<i>Dongjun Yang and Younggoo Kwon</i>	
Characterization of the Sick LMS511-20100Pro Laser Range Finder for Simultaneous Localization and Mapping	254
<i>Wenpeng Zong, Guangyun Li, Minglei Li, Li Wang, and Yanglin Zhou</i>	
Performance Metrics for Coverage of Cleaning Robots with MoCap System	267
<i>Kuisong Zheng, Guangda Chen, Guowei Cui, Yingfeng Chen, Feng Wu, and Xiaoping Chen</i>	
A General Batch-Calibration Framework of Service Robots	275
<i>Kuisong Zheng, Yingfeng Chen, Feng Wu, and Xiaoping Chen</i>	
Autonomous Navigation Control for Quadrotors in Trajectories Tracking	287
<i>Wilbert G. Aguilar, Cecilio Angulo, and Ramón Costa-Castello</i>	
On-Board Visual SLAM on a UGV Using a RGB-D Camera	298
<i>Wilbert G. Aguilar, Guillermo A. Rodríguez, Leandro Álvarez, Sebastián Sandoval, Fernando Quisaguano, and Alex Limaico</i>	
Projective Homography Based Uncalibrated Visual Servoing with Path Planning	309
<i>Zeyu Gong, Bo Tao, Hua Yang, Zhouping Yin, and Han Ding</i>	
A Fully Cloud-Based Modular Home Service Robot	320
<i>Yili Wang, Naichen Wang, Zhihao Chen, and Wenbo Chen</i>	
People Tracking in Unknown Environment Based on Particle Filter and Social Force Model.	335
<i>Yang Wang, Wanmi Chen, and Yifan Luo</i>	
Time-Jerk Optimal Trajectory Planning for a 7-DOF Redundant Robot Using the Sequential Quadratic Programming Method	343
<i>Li Jiang, Shaotian Lu, Yikun Gu, and Jingdong Zhao</i>	
Nonlinear Control of Omnidirectional Mobile Platforms.	354
<i>Víctor H. Andaluz, Oscar Arteaga, Christian P. Carvajal, and Víctor D. Zambrano</i>	

Virtual Reality and Artificial Intelligence

Leaf Recognition for Plant Classification Based on Wavelet Entropy and Back Propagation Neural Network	367
<i>Meng-Meng Yang, Preetha Phillips, Shuihua Wang, and Yudong Zhang</i>	
A Registration Method for 3D Point Clouds with Convolutional Neural Network	377
<i>Shangyou Ai, Lei Jia, Chungang Zhuang, and Han Ding</i>	
Tool Wear Condition Monitoring Based on Wavelet Packet Analysis and RBF Neural Network.	388
<i>Tao Li, Dinghua Zhang, Ming Luo, and Baohai Wu</i>	
Research on Modeling and Simulation of Distributed Supply Chain Based on HAS	401
<i>Wang Jian, Huang Yang, and Wang ZiYang</i>	
Robust EMG Pattern Recognition with Electrode Donning/Doffing and Multiple Confounding Factors	413
<i>Huajie Zhang, Dapeng Yang, Chunyuan Shi, Li Jiang, and Hong Liu</i>	
A Robot Architecture of Hierarchical Finite State Machine for Autonomous Mobile Manipulator.	425
<i>Haotian Zhou, Huasong Min, Yunhan Lin, and Shengnan Zhang</i>	
A Diagnostic Knowledge Model of Wind Turbine Fault.	437
<i>Hongwei Wang, Wei Liu, and Zhanli Liu</i>	
Robust Object Tracking via Structure Learning and Patch Refinement in Handling Occlusion.	449
<i>Junwei Li, Xiaolong Zhou, Shengyong Chen, Sixian Chan, and Zhaojie Ju</i>	
Graspable Object Classification with Multi-loss Hierarchical Representations.	460
<i>Zhichao Wang, Zhiqi Li, Bin Wang, and Hong Liu</i>	
A Robotized Data Collection Approach for Convolutional Neural Networks . . .	472
<i>Yiming Liu, Shaohua Zhang, Xiaohui Xiao, and Miao Li</i>	
Virtual Simulation of the Artificial Satellites Based on OpenGL	484
<i>Yang Liu, Yikun Gu, Zongwu Xie, Haitao Yang, Zhichao Wang, and Hong Liu</i>	
Wearable Rehabilitation Training System for Upper Limbs Based on Virtual Reality	495
<i>Jianhai Han, Shujun Lian, Bingjing Guo, Xiangpan Li, and Aimin You</i>	

Active Gait Rehabilitation Training System Based on Virtual Reality	506
<i>Bingjing Guo, Wenxiao Li, Jianhai Han, Xiangpan Li, and Yongfei Mao</i>	

A Realtime Object Detection Algorithm Based on Limited Computing Resource	517
<i>Fei Liu, Yanbin Wang, Yimin Wei, Chunxue Li, and Li Tang</i>	

Aerial and Space Robotics

Linearity of the Force Leverage Mechanism Based on Flexure Hinges.	527
<i>Jihao Liu, Enguang Guan, Peixing Li, Weixin Yan, and Yanzheng Zhao</i>	

A Kind of Large-Sized Flapping Wing Robotic Bird: Design and Experiments	538
<i>Erzhen Pan, Lianrui Chen, Bing Zhang, and Wenfu Xu</i>	

A Trajectory Planning and Control System for Quadrotor Unmanned Aerial Vehicle in Field Inspection Missions	551
<i>Gang Chen, Rong Wang, Wei Dong, and Xinjun Sheng</i>	

Attitude and Position Control of Quadrotor UAV Using PD-Fuzzy Sliding Mode Control	563
<i>Jong Ho Han, Yi Min Feng, Fei Peng, Wei Dong, and Xin Jun Sheng</i>	

Integrated Design and Analysis of an Amplitude-Variable Flapping Mechanism for FMAV.	576
<i>Peng Nian, Bifeng Song, Wenqing Yang, and Shaoran Liang</i>	

Modeling and Hover Control of a Dual-Rotor Tail-Sitter Unmanned Aircraft	589
<i>Jingyang Zhong, Bifeng Song, Wenqing Yang, and Peng Nian</i>	

Experimental Study on Dynamic Modeling of Flapping Wing Micro Aerial Vehicle	602
<i>Shaoran Liang, Bifeng Song, Wenqing Yang, and Peng Nian</i>	

A Novel Low Velocity Robotic Penetrator Based on Ampere Force	613
<i>Jingkai Feng, Jinguo Liu, and Feiyu Zhang</i>	

Research of the Active Vibration Suppression of Flexible Manipulator with One Degree-of-Freedom	624
<i>Luo Qingsheng and Li Xiang</i>	

Space Robotic De-Tumbling of Large Target with Eddy Current Brake in Hand	637
<i>Jiayu Liu, Baosen Du, and Qiang Huang</i>	

Development of Modular Joints of a Space Manipulator with Light Weight and Wireless Communication	650
<i>Liang Han, Can Luo, Xiangliang Cheng, and Wenfu Xu</i>	
Accurate Dynamics Modeling and Feedback Control for Maneuverable-Net Space Robot.	662
<i>Yakun Zhao, Panfeng Huang, and Fan Zhang</i>	
Research on Space Manipulator System Man Machine Cooperation On-Orbit Operation Mode and Ground Test	673
<i>Dongyu Liu, Hong Liu, Bainan Zhang, Yu He, Chao Luo, and Yiwei Liu</i>	
Collaborative Optimization of Robot's Mechanical Structure and Control System Parameter	686
<i>Yuanchao Cheng, Ke Li, Fan Yang, Songbo Deng, Yuanyuan Chang, Yanbo Wang, and Xuman Zhang</i>	
Nonlinear MPC Based Coordinated Control of Towed Debris Using Tethered Space Robot	698
<i>Bingheng Wang, Zhongjie Meng, and Panfeng Huang</i>	
Design and Experimental Study on Telescopic Boom of the Space Manipulator	707
<i>Shicai Shi, Qingchao He, and Minghe Jin</i>	
Trajectory Planning of Space Robot System for Reorientation After Capturing Target Based on Particle Swarm Optimization Algorithm	717
<i>Songhua Hu, Ping He, Zhurong Dong, Hongwei Cui, and Songfeng Liang</i>	
An Iterative Calculation Method for Solve the Inverse Kinematics of a 7-DOF Robot with Link Offset	729
<i>Shaotian Lu, Yikun Gu, Jingdong Zhao, and Li Jiang</i>	
Kinematic Nonlinear Control of Aerial Mobile Manipulators	740
<i>Victor H. Andaluz, Christian P. Carvajal, José A. Pérez, and Luis E. Proaño</i>	

Mechatronics and Intelligent Manufacturing

Design, Modeling and Analysis of a Magnetorheological Fluids-Based Soft Actuator for Robotic Joints.	753
<i>Daoming Wang, Lan Yao, Jiawei Pang, and Zixiang Cao</i>	
Control of a Magnet-Driven Nano Positioning Stage with Long Stroke Based on Disturbance Observer	765
<i>Letong Ma, Xixian Mo, Bo Zhang, and Han Ding</i>	

Experimental Research of Loading Effect on a 3-DOF Macro-Micro Precision Positioning System	777
<i>Lingbo Xie, Zhicheng Qiu, and Xianmin Zhang</i>	
Development of Control System for the Assembly Equipments of Spacer Bar Based on PLC	788
<i>Hong He, Congji Li, Xiaoqin Li, Zegang Wang, and Peng Xu</i>	
HADAMARD Transform Sample Matrix Used in Compressed Sensing Super-Resolution Imaging	796
<i>Mei Ye, Hunian Ye, and Guangwei Yan</i>	
Numerical Simulation of Forming Process Conditions and Wall Thickness for Balloon	808
<i>Xuelei Fu, Hong He, and Wenchang Wang</i>	
Tri-Dexel Model Based Geometric Simulation of Multi-axis Additive Manufacturing	819
<i>Shanshan He, Xiongzhi Zeng, Changya Yan, Hu Gong, and Chen-Han Lee</i>	
Development of Rubber Aging Life Prediction Software	831
<i>Hong He, Kai Liu, Xuelei Fu, and Kehan Ye</i>	
A Reliability Based Maintenance Policy of the Assembly System Considering the Dependence of Fixtures Elements Across the Stations.	843
<i>Shiming Zhang, Feixiang Ji, and Yinhua Liu</i>	
Efficient Cutter-Freeform Surfaces Projection Method for Five-Axis Tool Path Computation	855
<i>Xiyan Li, Chen-Han Lee, Pengcheng Hu, Yanyi Yang, and Fangzhao Yang</i>	
Optimization of Milling Process Parameters Based on Real Coded Self-adaptive Genetic Algorithm and Grey Relation Analysis	867
<i>Shasha Zeng and Lei Yuan</i>	
HybridCAM: Tool Path Generation Software for Hybrid Manufacturing.	877
<i>Xiongzhi Zeng, Changya Yan, Juan Yu, Shanshan He, and Chen-Han Lee</i>	
Author Index	891

Intelligent Robotics and Applications

10th International Conference, ICIRA 2017, Wuhan,
China, August 16–18, 2017, Proceedings, Part I

Huang, Y.; Wu, H.; Liu, H.; Yin, Z. (Eds.)

2017, XXXIII, 887 p. 565 illus., Softcover

ISBN: 978-3-319-65288-7