2024 IEEE International Conference on Mechatronics and Automation (ICMA 2024)

Tianjin, China
4-7 August 2024

Pages 1-631

IEEE Catalog Number: CFP24839-POD
ISBN: 979-8-3503-8808-4

Copyright © 2024 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP24839-POD
ISBN (Print-On-Demand):	979-8-3503-8808-4
ISBN (Online):	979-8-3503-8807-7
ISSN:	2152-7431

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

Table of Contents

MA1-P Poster Session (Intelligent Mechatronics and Automation)

Design of a multifunctional end-effector for robotic replacement of TBM disc cutters 1
Jinshu Zhou, Qiang Yang, Liang Du, Zhengtao Hu, Sheng Bao, Jianjun Yuan, Jintao Xie, Meng Li, Weidong Wang

A Control Method for Assisted Stair Climbing Exoskeleton Robot 7
Junqiang Li, Yushi Wei, Kuan Yang, Juan Wang

Evaluation of Integrated Benefits of Shore Power based on Network Hierarchy Analysis Method 14
Tao Su, Leilei Wang, Yu Song, Zhongli Bai

Structure displacement extraction method based on image feature matching 20
Xiaoting Chen, Youming Wang, Jiyong Tan

Multiple Demand Response Models for Integrated Energy Systems Based on Electric-Heat Loads 26
Qing Li, Yanjuan Wu, Jianniang Qiu

Research on Emotional Cognition of Game Players Based on Functional Brain Network 32
Junchi Wang, Yu Song, Xuewen Zhao, Zhongli Bai

Levitation Control of Doubly-Fed Linear Motor with Multi-Phase AC Excitation on Mover 38
Xiusen Wang, Zaimin Zhong, Yeqin Wang, Wei Chen

CWF-HRNet：Context-aware Fusion for Human Pose Estimation based on High-Resolution Networks 44
Shiyu Ding, Jin Li, Kuan Luan, Hong Liang, Jiqing Xing

Parameter Recognition of Solar Cell Model Based on ICOOT Algorithm 50
Wang Rong, Yanjuan Wu, Jisong Ye

Research on Activity Scheduling of Flexible Manufacturing Cell Based on PDDL 56
Zhenxing Gao, Niansong Zhang, Aimin Wang, Dan Zhu

Research on 2D Nesting Optimization Combining Improved no-fit polygon Method and Genetic Algorithm 62
Xiaowei Wang, Niansong Zhang, Aimin Wang, Yan Ge

Active Disturbance Rejection Regulation Control Strategy of Microgrid Load Side Interface Converter Based on TD3 Algorithm 68
Youjie Ma, Xiangzhen Li, Xuesong Zhou

Improved Euclidean Clustering and Segmentation Algorithm for Workpiece Identification 74
Zhen Zhang, Niansong Zhang, Aimin Wang

A Smart Wheelchair Supple Control System Based on Hall Rocker 79
Hao Ding, Xin Guo, Zhi Lan

Model-free Adaptive Heading Control of Hovercraft Based on Data-driven 85
Wenjie Wu, Dayong Su, Shuyi Han, Song Gao

Frequency Control Method of GFM Converter Combined with improved LADRC controller 90
Wei Li, Guozun Zhang

FGNet: Faster Robotic Grasp Detection Network 96
Bangqiang Cheng, Lei Sun

Anti-overturning Method of Mobile Manipulator During Obstacle Crossing Based on Coupling Dynamics 101
Jiashang Sun, Lingyu Sun, Jidong Jia, Zhiwen Zhang

Research on Cable Collection of Offshore Floating Photovoltaic System 107
Liqian Zhang, Qiang Fu, Chunjie Wang

Simulation Analysis of Prefabricated Deformation on Sealing Performance Enhancement 113
Xin-Rong Hu, Min Tang, Ming-Jian Lu, Wu Ouyang, Xin-Ping Yan

Design and Optimization of 2-MMPPHR Based on Micro-Perforated Panels and Helmholtz Resonators 118
Wanpeng Jiao, Min Yang, Zhonghui Ma, Yinchong Fu, Min Chen, Xiaomei Xie

Research on Seismic Bracing Monitoring System Based on Wireless Transmission 124
Lujia Wang, Baofeng Zhang, Wei Wang, Zhiwei Li, Junchao Zhu

Development of the Physical Simulation Platform for Catenary Cantilever 130
Jinjiao Xie, Chuxiong Hu, Zhenhua Li, Mingli Liu

Fan Bearing Fault Diagnosis Algorithm Based on Improved VMD and LLe 136
Chunyu Feng, Juanjuan Yu, Lei Shao, Ji Li, Chao Li, Hongli Liu

Health Management System for the Industrial Robot Control Cabinet 142

Song Xue, Chenglie Du, Cheng Yang

Relative Motion Recovery Reconstruction Algorithm for Fixed Cameras 147
Yirui Wang, Yibo Zhen, Bing Li

Enhancing Predictive Maintenance Hyperparameter Optimization and Adopted Strategies 153
Maki K. Habib, Kamal Mohamed

Structural Design and Simulation of a Bionic Sea Turtle Robot 159
Huaxiang Su, Qiang Fu, Mengmeng Liu

Research on Design and Control Strategy of Multi-winding PMSM for Solar-powered UAV 165
Qinghe Meng, Chunjie Wang, Qiang Fu, Peng Chen

Viability Study of Ammonia as Aircraft Fuel for Airbus A320 with Integrated Carbon Fiber Structures 172
Kaoutar Eoukich, Aya El Kohen, Nada Bouskouk, Fatima Zahrae Azergui, Amal Salhi, Yassine Salih Alj

Design and Analysis of Rotary Constant Tension Mooring Device 178
Nan Liu, Peijian Qu, Songgui Chen, Wenjun Shen, Lei Zhang, Zhaohui Zhang, Nan Li

Load Prediction of Composite Curing Equipment Cluster Based on Combined EEMD-WOA-LSTM Model 183
Chunyu Feng, Zhenyu Li, Lei Shao, Ji Li, Chao Li, Hongli Liu

Fatigue Analysis of Jumper Cables in Floating Body 189
Hao Zhang, Qiang Fu, Chunjie Wang

Member Positioning Method Based on Vector Orientation Analysis 194
Yu Song, Haobo Zhang, Yan Wang, Miao Lv, Lin Niu, Nan Yu

Motion Planning for Steam Generator Tube Sheet Quadruped Maintenance Robot 200
Biying Xu, Xuehe Zhang, Xuan Yu, Hegao Cai, Kuan Zhang, Jie Zhao, Jizhuang Fan

Performance-optimized Multiplex Detection Sensor for Coagulation Indicators in Whole Blood 205
Anran Zheng, Zixu Wang

Voltage Balance Control Strategy for FC 3-Level Inverter Based on Zero Vector Time Redistribution 210
Wei Li, Yuefan Wang, Xiaoyong Ma

A Collision Detection Algorithm of Inspection Robot for Steam Generator Heat Transfer Tubes 216
Xuan Yu, Biying Xu, Jinghan Lin, Kuan Zhang, Jizhuang Fan, Jie Zhao

Backstepping Sliding Mode Control of Underactuated Unmanned Surface Vehicle Based on Finite Time Observer 222
Jianniang Qiu, Yanjuan Wu, Qing Li

Research on Attitude Control of Cable Underwater Cleaning Robot 228
Xinping Pei, Xuebin Gu, Yupeng Zou, Liangbing Lei, Lixun Zhang

Kinematic Analysis and Experimental Research on Parallel Cable-driven Puncture Surgery Robot 234
Yupeng Zou, Yanxing Zhang, Guangxu Zhou, Keyu Pan, Jieren Zheng, Mengfei Wang

Research on key techniques of path planning for Pinecone picking robot 240
Haile Chen, Lin Zhang, Siyu Zhang, Yale Jiang, Lidan Yan, Liang Zheng

A Novel Vascular Interventional Robot for Cardiac Ablation Surgery 245
Jinshan Zuo, Linshuai Zhang, Xinlin Hao, Yang Yang, Xinyu Zhang, Tao Jiang

Research on Mechanical Properties of Steel Girth Welds of X80 Pipeline in Service 251
Hao Zhang, Maolin Ma, Weijin Xu, Zhibo Guo

Research on Control Strategy of AC/DC Bi-Directional Converter 257
Fulong Wu, Baofeng Yang, Changxing He

Research on the performance of distance measurement system based on binocular vision 263
Bibo Jiang, Jianyuan Zhang, Xueshuai Yang, Zhiwei Li

Based on the Optimization and Performance Evaluation of YOLOv8 Object Detection Model with Multi-backbone Network Fusion 269
Jisong Ye, Yanjuan Wu, Wang Rong

MP1-1 Intelligent Mechatronics and Application (I)

Simulator and Transplantable Control Architecture Development for an Electric Autonomous Vehicle 275
Jiaming Zhang, Hang Cui, Junzhe Wu, William R. Norris

Efficient Sparse LiDAR Data Reconstruction using Compressed Sensing for Real-Time Perception in Autonomous Vehicles 281
Anas Chbouk, Mohamed Gotni, Faris Chawki, Mohammed En-Nay, Mohamed Abbas

Hattati, Yassine Salih-Alj

Comparative Analysis of Controls in Permanent Magnet Synchronous Generator-Based Wind Turbines 287
Emad Elhaji, Shichao Liu, Hicham Chaoui

Reducing Physical Load for Desk-Height Tasks by Supporting Kneeling Posture with a Lower Limb Exoskeleton 293
Yaonan Zhu, Sojiro Sugiura, Jian Huang, Yasuhisa Hasegawa

Curve Parametric Modeling of Planar Soft Robots 299
Dulanjana M. Perera, Nathan Byrd, Dimuthu D. K. Arachchige, Bhaskar Vajipeyajula, Kevin C. Galloway, Isuru S. Godage

Bubbles– Swarm Micro Surface Robots for Underwater Inspection 305
Yifeng He, Barry Lennox, Cheng Hu, Farshad Arvin

MP2-1 Intelligent Mechatronics and Application (II)

Magnetically Actuated Floating Millirobot Platform for Streamlined Flexible Neural Electrode Manipulation 311
Bingze He, Zhiang Zhang, Jianxin Yang, Yujian An, Yao Guo, Guang-Zhong Yang

Mouse Pose Estimation Using Synthetic Datasets Replicating Experimental Environments 317
Ryudai Yokokawa, Chikako Hara-Miyauchi, Itsuki Ajioka, Shingo Maeda

Design and Analysis of a Modular Flapping Wing Robot with a Swappable Powertrain Module 323
Snehit Gupta, K P Rithwik, Kurva Prashanth, Avijit Ashe, Harikumar Kandath

Integrating DeepRL with Robust Low-Level Control in Robotic Manipulators for Non-Repetitive Reaching Tasks 329
Mehdi Heydari Shahna, Seyed Adel Alizadeh Kolagar, Jouni Mattila

Development of Wearable Lightweight Continuum Manipulator to Enhance Capability of Human Arm 337
Shotaro Shimegi, Keitaro Ishibashi, Hiroyuki Ishii

Centimeter-Scale Submarine Robot for Monitoring Coral Reef Ecosystem 345
Zongze Li, Yi Zhang, Shujing He, Xiyu Zhu, Tanyong Wei, Chengzhi Hu

MP3-1 Signal and Image Processing (I)

Research on Mobile Robot Localization Algorithm with Improved ORB Extraction Matching 351

Hongchang Sun, Longfei Wei, Yongxiang Jiang, Yunfei Su, Sanpeng Deng, Hao Sun, Haihang Wang

Motor Imagery and Mental Arithmetic Classification Based on Transformer Deep Learning Network 357
Yuanyuan Ye, Jigang Tong, Sen Yang, Yinghui Chang, Shengzhi Du

Sequence Similarity Measurement for Multi-Human Motion Ability Assessment 363
Lingling Chen, Ding Wang, Ye Zheng, Xin Guo

Generating PET images from low-dose data using a cycle PET reconstruction convolutional neural network 369
Mingwei Zhai, Hongpeng Wang, Jianda Han, Tingting Wu, Hongwei Ye

DCT-ISTA: A Network Block to Denoise Raw Vibration Signal with Interpretability for Mechanical Fault Diagnosis 375
Yujie Zhao, Shibin Wang, Yujin Wang, Zhi Cao

Vehicle Mounted Strapdown Inertial Coarse Alignment Algorithm for LMD-KPCA-WT 382
Lixin Zhu, Xiuwei Xia, Ya Zhang, Pengli Xu, Shiwei Fan, Kefei Yuan

MP1-2 Intelligent Mechatronics and Application (III)

One-Step Auto-Registration using Linear Structured Light-based for Neurosurgical Navigation 388
Yuhua Li, Shan Jiang, Zhiyong Yang, Zifeng Liu, Bowen Li, Zeyang Zhou

Handling Collaborative Robot System for Grasping Medical Cotton Cloth Porous with Bernoulli Gripper 394
Kitti Suwanratchatamanee, Hideyuki Sawada, Shuji Hashimoto

Robotic Catheterization for Trauma-Reduced Minimally Invasive Surgeries with Morphing Adaptation 400
Xianqiang Bao, Metin Sitti

Design and Optimization of Levitation Gap Sensors for High-speed Maglev trains 406
Wei Chen, Zaimin Zhong, Yeqin Wang, Xiusen Wang

Design and Simulation of Bionic Amphibious Mother and Child Robots 412
Hui Yu, Junjie Wang, Liang Zheng

Theoretical Analysis on Lateral Vibration Characteristics of Rotor Considering Electromagnetic Torque 418
Hao Lin, Xin Wei, Leiming Song, Yiyang Chen, Ling Li, Haipeng Geng

MP2-2 Intelligent Mechatronics and Application (IV)

A Crack Detection Model of Wind Turbine Blade Inner Surface Based on Image Fusion Applicable to Embedded Platforms 424
Jingkun Guo, Ruiqin Wang, Yutong Jin, Hongwei Zheng, Shijie Dai

Ultrasound-Guided Localization System for Pericardial Effusion Puncture Robot Utilizing Deep Learning Models 430
Fan Nian, Jingjing Luo, Xiuhong Tang, Jinlei Jiang, Hongbo Wang, Shijie Guo

Vision-Integrated Digital Twin for Industrial Manipulator Unloading 435
Jianghao Zhou, Zilong Liu, Chen Luo, Yijun Zhou

Lane-Keeping Assistance System Based on Fast Lane Line Detection Network and Model Predictive Control 441
Chengjun Ding, Yitong Wang, Ziying Xuan, Yukun Geng, Tengfei Ma

Nighttime Vehicle Detection Algorithm Based on Improved YOLOv8 447
Qianqian Huang, Mingzhu Wei, Xinhua Wang

Design and Tolerance Analysis of an Androgynous Petal-Shaped End Tool Quick-Change Mechanism for Space Manipulator 453
Man Huang, Fan Zhang, Yanbo Wang, Shanda Wang, Jiankang Zhi, Ke Li, Liping Pi

MP3-2 Signal and Image Processing (II)

Path Planning of Breast Ultrasound Scanning Based on Three-Dimensional Point Cloud Model 459
Xinran Zhang, Haiyan Du, Dong Guo, Yongde Zhang

VBAKF-based Correction Algorithm for Pure Inertial Solving of Attitude Angles 465
Huhe Chen, Fei Yu, Ya Zhang, Wei Gao, Xu Gao, Kefei Yuan

Convolution and Transformer based hybrid neural network for Road Extraction in Remote Sensing Images 471
Shufan Liu, Yang Wang, Haoqi Wang, Youqiang Xiong, Yinfeng Liu, Chenxi Xie

Image Dehazing Method Based on Diffusion Model 477
Fengxu Guan, Haitao Lai, Hanyu Zang, Jinbao Huang

Lightweight Oracle Bone Character Detection Algorithm Based on Improved YOLOv7-tiny 485
Ying Li, He Chen, Weike Zhang, Wenqiang Sun

IDD-YOLOv5: A Lightweight Insulator Defect Real-time Detection Algorithm 491
Yang Lu, Dahua Li, Qiang Gao, Xiao Yu, Xuan Li, Zhongli Bai

MP1-3 Intelligent Biomedical Instrument Technology

Research on a Novel Hand Exoskeleton Rehabilitation Training System 496
Shuoxin Gu, Zhang Ye, Linshuai Zhang, Rui Peng, Jiaxin Wang, Haonan Li

Development and Application Validation of networked stool and pee management system 502
Linkun Zhou, Yadong Mo, Guang Yang, Xu Tang, Runxiao Liu, Xiangyan Zhang, Ying Zhang, Jian Li, Shiming Wei

A Study of Vertebral Displacement Due to Disc Loading and Its Risks when Using Lumbar Assist Devices 508
Koki Mitsuiwa, Ryojun Ikeura, Soichiro Hayakawa, Syunichi Yoshida

Depression's Effect on Voluntary Facial Mimicry in Adolescents: Insights for Intervention 514
Zhibin He, Zhongliang Yu, Shaojun Liu, Ying Cao, Lili Li

A Three-Dimensional Catheter Distal Force Sensor Based on Fiber Bragg Grating for Cardiac Ablation 519
Linshuai Zhang, Yuyang Luo, Xin Tian, Shuoxin Gu, Tao Jiang

Investigation of Upper Limb Training Device Integrating Cognitive and Motor Functions Application 525
Zhenda You, Ying Liu, Zengyong Li, Jixiao Liu

MP2-3 Os: Signal Measurement and Process in Automatic Control (I)

Rubbing Oracle Bone Character Recognition Based on Improved YOLOv8 Network 531
Weike Zhang, Fangfang Han, Bo Wang, Yan Zhao

Design and Implementation of License Plate Positioning Algorithm based on FPGA 537
Qianwen Lou, Xiwei Peng, Haizhi Gao, Xiaoxing Feng, Ze Li

EEG Signal Driving Fatigue Detection based on Differential Entropy 543
Danyang Wang, Jigang Tong, Sen Yang, Yinghui Chang, Shengzhi Du

Electrode Deviation Evaluation of sEMG during Wrist Motion Classification using SVM 549
Ruijie He, Shuxiang Guo, He Li, Hanze Wang, Bin Wang, Mingchao Ding

Improved Image Segmentation Algorithms based on Convolutional Neural Networks 555
Zichen Liu, Jian Xu, Liangang Yin

Deep Learning Based Tremor Signal Recognition Method for a Vascular 561

Interventional Surgery Robot
Jintao Luo, Shuxiang Guo, Yonggan Yan, Duohao Zhao, Chuqiao Lyu, Zhijun Lin, Bin Wang, Mingchao Ding

MP3-3 Os: Signal Measurement and Process in Automatic Control (II)

FE R-CNN: Feature Enhance R-CNN for Few-Shot Ship Object Detection 567
Ming Yuan, Hao Meng

A study on gait analysis based on the pose estimation algorithm RTMPose using knee angle as a metric 573
Xin Guo, Huimin Zhao

CatMonitor : LTE Cat-1 based Wildlife Intelligent Monitoring System 579
Jingxiang Zhang, Zhenhao Xu, Ya He, Yuting Wang

An Improved Time Delay Estimation Algorithm in Microphone Array Sound Source Localization 585
Xiaoyao Zhao, Xuesheng Li, Kaifei Ji, Erya Da, Jihao Zheng, Zhonghui Ma, Fuyu Tao

An Improved Small Feature Segmentation Algorithm Based on U-Net Model 591
Weikun Chen, Changjuan Yao, Ming Yang, Yanchang Zhang

DH Detector: One-stage detection model with double-head detector and efficient convolution 596
Ziyuan Feng, Lei Sun

MP1-4 Vision System, Robotic Vision

A Novel Fall Detection Methodology Based on Feedback-Fusion and Optimal-Allocation Model 602
Bing Qi, Menghan Guan, Weiqi Sun

Two-stage Hybrid Insulator Defect Inspection from Aerial Images 608
Siwen Sun, Changjiang Song, Xiaodan Cong, Xiaoxi Liu, Lei Ding

A Local-to-Global Point Cloud Registration Algorithm Based on Joint Matching of Multi-keypoints 614
Cong Tan, Jianjun Sha, Hongyu Guo, Jixin Gao

Rolling bearings fault diagnosis method based on NRBO-SVM 620
Minjuan Wang, Kai Huo, Qian Jia

Tableware Recognition for Tidying-up Robot System 626
Zhanxiang Fu, Hiroaki Seki, Tokuo Tsuji, Tatsuhiro Hiramitsu

Research on Obstructed Object Detection Algorithms in Medical X-ray images Based on Deep Learning 632
Liu Liguo, Lu Hao, Dai Fengzhi

MP2-4 Biomimetic Systems (I)

Underwater Target Recognition and Tracking Based on Bionic Horseshoe Crab Robot 638
Yuke Ma, Yan Piao, Yu Wang, Liang Zheng, Hui Yu

Deep Learning-based Detection of Deep-sea Hydrothermal Polymetallic Sulfides, Plume, and Their Biological Communities 644
Shengya Zhao, Xiufen Ye, Shuxiang Guo, Zhengguang Li, Xinkui Mei

A Breeding Animal Detection Method from Images With Grided Heatmaps 650
Hongtao Zhang, Dongbing Gu, Kang Liang

A novel passive lumbar exoskeleton that provides multiple traction forces 656
Kaicheng Qi, Zhiyang Yin, Chao Li, Jianjun Zhang, Shijie Guo

A Clamping Perception System Based on Multi-source Sensors for Amphibious Spherical Robots 662
Chengchao Gu, Shuxiang Guo, He Yin, Ao Li, Bin Wang, Mingchao Ding

Design and Control of an Ellipsoidal Underwater Robot Driven by Four-Vector Propellers 668
Jinglei Nie, Shuxiang Guo, Chunying Li, Qirong Lei

MP3-4 Biomimetic Systems (II)

Dynamics Evaluation of a Magnetic Actuated Soft Bionic Minirobot with Paired Fin 674
Zixu Wang, Anran Zheng, Shuxiang Guo

Motion Planning of Redundant Robotic Arm Based on Human Arm Motion Principles 679
Hao Niu, Xiuli Zhang

Cooperative Motion Planning for Mobile Humanoid Robots Based on the Manipulability Map 685
Wei Li, Xiuli Zhang

Wave Interference Suppression for Underwater Polarization Navigation 691
Pengli Xu, Ya Zhang, Wei Gao, Shiwei Fan, Lixin Zhu, Kefei Yuan

A Snake-Inspired Collision-Free Path Planning Algorithm and Experiments for Hyper-Redundant Manipulators 697
Yiqun Yin, Lei Yang, Yunze Ma, Junjie Zhu, Xiaoxuan Zhao, Jiabao Zhu, Linhui

Zhang

Study on the Improved Water Flow Prediction Based on Classification-Regression Approach for Amphibious Spherical Robots 703
Jun Leng, Shuxiang Guo, Chunying Li, Sheng Cao

MP1-5 Medical, Biomedical and Rehabilitation Systems (I)

Review on Development Status, Challenges and Development Trends of Surgical Robots 709
Liyuan Zhang, Xiaoxuan Qi, Yige Peng, Sheng Bao, Jianjun Yuan, Shijie Guo

Generating Synthetic X-ray Image Methods for Vascular Interventional Surgery 715
Bingzhi Shen, Shuxiang Guo, Chuqiao Lyu, Yonggan Yan, Duohao Zhao, Zhijun Lin, Bin Wang, Mingchao Ding

Diagnosis and Causal Analysis of Depression Based on EEG Features and Machine Learning 721
Lizhuo Shao, Lanqi Li, Qianke Du, Jiayi Wang, Yupu Chen, Ningbo Yu

Excited ICU Delirium Behavior Detection Method Based on Human Key Points Recognition 727
Shijie Guo, Yuyao Sun, Li Yin, Yanli Geng

Study on an Adaptive Clamping Device for Passive Safety Delivery of Vascular Intervention Robot 733
Sheng Cao, Shuxiang Guo, Jian Guo, Jian Wang, Chunying Li, Huiyin Xu, Bin Wang, Mingchao Ding

Comfort Research of Piggyback Transfer Robot Based on sEMG Evaluation Model 738
Kaicheng Qi, Rui Li, Teng Liu, Xinlong Li, Jianjun Zhang, Shijie Guo

MP2-5 Medical, Biomedical and Rehabilitation Systems (II)

Design and Characterisation of Electromagnetic Coils in Positioning Device for Vascular Interventional Surgery 746
Yonggan Yan, Shuxiang Guo, Bingzhi Shen, Duohao Zhao, Bin Wang, Mingchao Ding

Design and Analysis of Secure Communication Method Based on P2P for Remote Robotic Surgery 752
Jinhua Li, Chi Zhang, Tiantian Cheng, Bo Guan, Zhisong Guo, Jianchang Zhao

Compliant control system of intelligent walking aid based on multi-sensor 759
Yi Wei-Cheng, Sunhao, Wangqiang

Design and Analysis of a Novel Intelligent Acupuncture Robot 765

Zhihang Yuan, Linshuai Zhang, Tao Jiang, Shuoxin Gu, Lin Xu, Zheng Yu, Jingbo Guan, Shiqi Jiang

A Hand Motion Recognition System Combining Wearable Sensing Gloves and Template Matching Algorithm 770
Dapeng Wang, Yupeng Fu, Bo Yang, Teng Liu, Chuizhou Meng, Shijie Guo

Performance Analysis of 4-RPUR Parallel Mechanism for Ankle Rehabilitation 776
Hongjian Yu, Zijia Guo, Zhenyi Wang, Sheji Sun, Zhijiang Du

MP3-5 Medical, Biomedical and Rehabilitation Systems (III)

Continuous Control Method for Lower Limb Rehabilitation Robot Based on Self-learning Strategy 782
Yibo Lu, Shijie Guo, Mengge Wang, Lingling Chen

Method for Enhancing Stability of Tension in Cable-Driven Minimally Invasive Surgical Instruments 788
Jinhua Li, Yue Yu, Chengcheng Cai, Xingchi Liu, Xu Jiang, Jianchang Zhao

High Precision Portable Bioimpedance Spectrometer for Enhanced Clinical Diagnostics 794
Du Jiahao, Yu Hongliu, Shi Ping, Fang Fanfu

Classification of Respiratory Sounds into Crackles and Noncrackles Categories via Convolutional Neural Networks 800
Qi Dexuan, Yuan Ye, Zhao Haiwen, Wu Wenjuan, Guo Shijie

Design and Implementation of a Comprehensive Testing and Research Platform for Miniature Blowers in Emergency Transport Ventilators 806
Xiaoyan Zhao, Peipei Zhang, Kesheng Wang, Jun Diao

Measurement Method and Uncertainty Analysis of POF Dosimeter for 125I Source Dose Parameters 812
Junchang Yu, Kexin Zhao, Hongquan Zhang

MP1-6 Control Theory and Application (I)

Active Impedance Control for Comfort of Piggyback Transfer Robot 818
Teng Liu, Shaoyang Zhang, Kaicheng Qi, Xinlong Li, Jianjun Zhang, Shijie Guo

Research on Low Voltage Ride-through Control of Permanent Magnet Direct Drive Wind Turbine Generators during Grid Faults 824
Jingjia Meng

A Distributed Drive Articulated Robot Control System Based on Steering Control 829

Strategy
Yunfei Su, Hongchang Sun, Yongxiang Jiang, Longfei Wei, Sanpeng Deng, Hao Sun, Dongcheng Ren

FAT-based Immersion and Invariance Adaptive Control for Rigid Body Attitude 834
Jianhui Wang, Guangping He, Shixiong Geng, Shuo Zhang, Jing Zhang

Active disturbance rejection control of load-side converter for photovoltaic microgrid based on fuzzy theory 840
Xuesong Zhou, Jiawei Wang, Youjie Ma

A wheelchair differential control method based on the coupling of control signal and environmental information 846
Kaicheng Qi, Chao Li, Zhiyang Yin, Jianjun Zhang, Shijie Guo, Xinying Shan

MP2-6 Control Theory and Application (II)

Parameter Identification and Fault Diagnosis of Servo System Based on Improved PSO Algorithm 852
Shiting Jiao, Youming Wang, Xuyang Miao, Zhen Li, Ji Pang, Xianzhi Wang

Chebyshev Polynomials Expanded Adaptive Control Strategy for Real-time Force Tracking of Electro-hydraulic Systems 858
Yu Tang, Kaidong Bo, Gang Shen, Zhencai Zhu, Hui Xie, Linyang Xu

Safety-Critical Control for Nonholonomic Tractor-Trailer Systems Using Control Barrier Functions and Differential Flatness 864
Yuyang Cai, Gang Wang, Zongyu Zuo, Yunfeng Ji, Peng Li

Position Sensorless Control of PMSM Based on EKF Current Noise Compensation and MRAS 870
Yuanchao Cao, Xing Ren, Qing Guo, Guicheng Wu, Qiang Long, Mengfan Ran

Active Disturbance Rejection Control of Microgrid DC-DC Converter Based on AC Algorithm 876
Zhiqiang Gao, Haojie Yan, Xuesong Zhou

Predefined-time Fast Tracking Control for Hovercraft with Comprehensive Uncertainty 882
Yujie Xu, Du Qin, Mingyu Fu

MP3-6 Actuator Design, and Novel Actuator Systems

Influence of Materials on the Transportation Performance of a Self-running Actuator Based on Ultrasonic Levitation 889

Yuanyuan Liu, Jiasheng Shi, Liang Zhang, Feng Xie

Design of a Custom Compact Actuator for Pediatric Rehabilitation Exoskeleton Robots 894
Yuantao Ding, Xiaoxiao Dong, Zhengtao Wang, Peizhong Yang, Suiran Yu

A Pneumatic Soft End-effector with multiple Grasping modes 900
Yunzhe Guo, Shuyong Liu, Huiming Qi, Hongqing Li, Ying Zhang

Dynamic Characteristics of Self-Eliminating-Backlash 3K Planetary Gear Train with Flexure-based Carrier 906
Qinghao Du, Guilin Yang, Weijun Wang, Chin-Yin Chen, Zaojun Fang

Development of a Novel Actuation Mechanism For a Legged Robot With Mono- and Bi-articulated Drive and Parallel Elasticity 912
Dan Otaki, Ryuki Sato, Aiguo Ming

Surface Roughness Measurement from Shape-from-focus 918
Yuezong Wang, Xiaoxiao Zhang, Jiqiang Chen, Lu Zhang

MP1-7 Human-System Interaction and Interface

A Multi-Level Feature Fusion Framework for Spoken Language Understanding 924
Dexin Xu, Ziming Cai, Hui Zhang, Qiming Zhang

Combined Rigid-Flexible Weight-Bearing Exoskeleton 930
Gongsheng Yu, Lei Sun

The influence of background continuity on "hole" object cognition 935
Yan Wu, Hui Zhang, Qi Li, Xiangbo Han

Research on Meteorological Data Storage Technology Based on NetCDF 941
Yachen Liu, Qi Wang

A Method for Rapid Generation of Passive Dynamic Walking Gait Based on Gait Library 946
Lishen Pu, Zhibo Wang, Yixuan Liu, Chunquan Xu

Development of a sEMG-Controlled Portable Exoskeleton System for Home-based Upper Limb Rehabilitation 952
He Li, Shuxiang Guo, Hanze Wang, Ruijie He, Bin Wang, Mingchao Ding

MP2-7 Biomimetic Systems (III)

Design and Analysis of a Hand Rehabilitation Exoskeleton Based on Compound Drive of Cable and Leaf Spring 958

Yupeng Zou, Guangxu Zhou, Keyu Pan, Yanxing Zhang, Jieren Zheng, Mengfei Wang

A High-sensitivity Three-Dimensional Force Sensing Sensor for Minimally Invasive Cardiac Ablation Surgery 964
Jie Jiang, Linshuai Zhang, Shiqi Jiang, Yuyang Luo, Xin Tian, Shuoxin Gu, Tao Jiang

A Modular Robotic System for Tibial Fracture Reduction and Rehabilitation with Vibrational Stimuli Generation 970
Zhenyi Wang, Hongjian Yu, Zijia Guo, Xiangyu Shen, Zhijiang Du

Gait Trajectory Control Technology of The Lower Limb Exoskeleton Rehabilitation Robot 976
Kaiyuan Liu, Fang Wang, Xueshan Gao

Mechanism Design of a Mole-inspired Robot Burrowing with Forelimb for Planetary Exploration 982
Zibiao Chen, Zhaofeng Liang, Kunquan Zheng, Hongmin Zheng, Haifei Zhu, Yisheng Guan, Kun Xu, Tao Zhang

Design of a Needle Guidance Based a Variable Stiffness Continuum Manipulator for Brain Surgery 988
Mohamed A. Naeem, Wenpeng Gao, Yili Fu

MP3-7 Biomimetic Systems (IV)

MicroWorm: The Design, Optimization, and Control of a Modular Sub-15 Millimeter Earthworm-Inspired Robot for the Navigation of Various Terrains 994
Hao Gu

Enhanced Rocker-based Inverted Pendulum Model for Human Dynamic Analysis in Lower Limb Exoskeletons 1002
Ziyang Zhang, Qian Xiang, Yong Liu, Huanyu Deng, Jiaxin Wang, Shijie Guo

Jumping Locomotion of Quadruped Robot During Running Based on Multiple Model Fusion 1008
Chong Pi, Xiuli Zhang

Preliminary Design of a Magnetically Actuated Multifunctional Biopsy Capsule Robot 1014
Lingling Zheng, Hanyao Song, Le Yan, Zixu Wang, Shuxiang Guo

Research on selective harmonic elimination technology based on enhanced whale optimization algorithm 1019
Weijie Li, Wenyi Zhang

An Optimized Model Predictive Flux Linkage Control without Weight Coefficient for 1025

Vehicle Motor
Danping Zhang, Jingnan Zhang, Xinghua Zheng, Haoyang Zhang

TA1-1 Manipulator Control and Manipulation (I)

Configuration-Aware Robotic Trajectory Planning Based on Deep Deterministic Policy Gradients for Active Object Tracking 1031
Yurou Zhang, Zhenzhou Shao, Shijie Guo

A Single-arm Mode for Operating Steering Wheel in Robot Driving 1037
Xin Zhu, Xuechao Chen, Kehong Chen, Yue Dong, Zhaoyang Cai, Zhuo Chen

Dynamic Friction Model with Velocity and Asymmetric Load Dependency for Robot Joints 1044
Menghui Liu, Ruiqing Luo, Zhengtao Hu, Sheng Bao, Liang Du, Jianjun Yuan

An Actuator Based on Linkage Structure and Control System Design 1050
Yucan Huang, Dingji Luo, Fang Wang, Xueshan Gao

TP1-1 Industrial, Manufacturing Process and Automation (I)

A machine learning approach to movement intention estimation using rollator-user interaction force 1056
Pengcheng Li, Shuxiang Guo

Research on Noise Reduction Algorithm for Nonlinear Ultrasonic Testing of Microcracks 1062
Jiaqi Xu, Qinxue Pan, Guangyuan Zhao, Lang Xu, Xiaoyou Zhou, Haoshen Yu

A Innovative RTCP Detection Method for Five-Axis Machine Tools Based on The Serial Length Ball Bars 1068
Huihao Yang, Li Du, Jiexiong Ding, Xiaodong Wang, Huishu Jia, Pengchao Bao, An Ji

An Adaptive Genetic Algorithm for Rectangular Layout of Defective Plate 1074
Tianchi Li, Niansong Zhang, Aimin Wang

Research on defect detection method for thin-walled parts based on point cloud data processing 1080
Yongxiang Jiang, Baihui Li, Hongchang Sun, Guifen Sun, Sanpeng Deng, Yingwei Qiao

Neural Network Fault Diagnosis for Open Circuit Fault of Synchronous Generator Rectifier Element 1086
Xinghua Zheng, Jingnan Zhang, Danping Zhang, Shiheng Wu

TP2-1 Industrial, Manufacturing Process and Automation (II)

Design and tracking performance analysis of a cable pulling rudder loading test mechanism 1092
Kai Chen, Tao Chen, Bin Wang, Cen Wang, Jun Wu

Parameterized Design of Heavy-duty Serial Industrial Robots 1099
Haitao Huang, Yuhua Zhou, Fengmin Chen, Haifei Zhu, Yisheng Guan

Research on The Modeling of The Dispatching System of Forging Workshop and The Scheduling Method of Thermal Connection 1105
Zhikai Zhang, Niansong Zhang, Aimin Wang, Hailong He

The Research of Intelligent Unmanned Mooring Device for Smart Port 1111
Nan Li, Nan Liu, Songgui Chen, Wenjun Shen, Lei Zhang, Zhaohui Zhang

The Design and Research of Resistance Instrument in Ship Towing Test 1116
Nan Li, Nan Liu, Xueqi Zhang, Chao Cui

Research on the Application of Unity-Based Virtual Simulation Verification Platform in Shield Machine Tool-Changing Robot 1122
Meijie Zhou, Ligang Wang, Jianjun Yuan

TP3-1 Industrial, Manufacturing Process and Automation (III)

Robotic Peg-in-hole Assembly Based on Generative Adversarial Imitation Learning with Hindsight Transformation 1128
Yifan Cai, Jingzhou Song, Xinglong Gong, Tengfei Zhang

Research on Related Technologies of Multi-needle Die Bonding Machine 1135
Yujian Zhao, Congrui Xu, Chenyao Bai, Yunlong Zhu

Research on Hybrid Job Shop Scheduling Optimization Based on Genetic Algorithms and Simulated Annealing 1141
Jinbao Zhang, Niansong Zhang, Aimin Wang, Lulu Zhang

An optimal AGV fleet sizing estimation method for flexible manufacturing systems 1147
Qi Zhou, Chao Peng, Jiawei Sun, Jiayu Zhu, Chenyang Lin, Bin Yang

A Main Production Planning Algorithm Based on Limited Resource Capacity Pools 1153
Jing Yang, Aimin Wang

TA1-2 Manipulator Control and Manipulation (II)

An improved YOLOv5 algorithm for enhancing pre-classification of soft gripper grasp 1159
Jiaqi Liu, Jin Guo, Yuan Yang, Shuxiang Guo

Optimal Dimensional Design of Parallel Mechanical Leg 1165
Xingchao Zhang, Hongbo Wang, Yu Rong, Yongfei Feng, Yunxiang Bai, Jianye Niu

Dynamic Parameters Identification for 6-DoF Industrial Robots 1171
Shunyu Wang, Jinhui Wu, Riqian Zheng, Yourui Tao

A Safety Strategy for Vascular Interventional Surgery Robots based on Interactive Interface and Motion Scaling 1176
Duohao Zhao, Shuxiang Guo, Yonggan Yan, Zhijun Lin, Bin Wang, Mingchao Ding

TP1-2 Modeling, Simulation Techniques and Methodologies (I)

A Novel Method to Reduce Toque Ripple with Variable dc-link Voltage 1182
Jicheng Zhao, Liwei Sun, Changwei Mi, Yongzhi Shan

Torque Estimation Based on An Improved SOGI-FLL for IPMSM 1188
Ling Meng, Yuan Zhu, Shihan Xu, Shihua Xu, Kewen Yang

IMU-based continuous prediction of human lower limb joint angles 1194
Zekun Liu, Jun Wei, Yusong Xing, Jingke Song, Jianjun Zhang

Optimization of electrical stimulation parameters based on the primary motor cortex 1200
Yuanyuan Xiao, Xin Guo, Zengyong Li

Neural network-based compensation of End position and attitude error in digital twin model of industrial robots 1206
Zhiqian Jiang, Wei Liu, Jinhui Wu, Mingliang Cheng, Zhengkai Huang

Parameter optimization of pulse generator based on genetic algorithm 1213
Xu Hai, Song Haoji, Chen Yanhe, Wang Xin

TP2-2 Modeling, Simulation Techniques and Methodologies (II)

Tunable Low-frequency Sound Absorber via Helmholtz Resonators with Embedded Spiral Tube 1219
Min Yang, Xiaozhen Huang, Wanpeng Jiao, Juntong Song, Min Chen, Xiaomei Xie

Performance Study of High-speed Switching Valve Bridge Pilot Hydraulic System 1225
Qiming Liu, Xu Liang, Jiahao Gao, Chunhong Wu, Xin Wang

A novel coupling amplification mechanism for improving stepping characteristics of stick-slip piezoelectric actuators 1231
Zhaochen Ding, Huadong Yu, Xiaoqin Zhou, Keqian Cai, Tong Li, Shujian Yi

Kinematic analysis and trajectory planning of two-limb 4-DOF high-speed parallel robot 1237

Weihua Sun, Yue Ma, Changrui Li, Bin Li, Yansen Zhao, Qi Liu

Kinematic modeling and simulation of a 5-DOF hybrid mechanism for active vibration isolation 1243

Xiaoqing Qiu, Yue Ma, Zijie Wang, Bin Li, Lin Pin, Doudou Duan

Research and Design of Multi-degree-of-freedom Simulation Platform for Actual Shield Machine Tool Changing Posture 1249

Lei Wang, Meijie Zhou, Jianjun Yuan, Liang Du, Sheng Bao

TP3-2 Modeling, Simulation Techniques and Methodologies (III)

Joint Estimation of SOC and Operating Voltage of Vehicle 12V Lithium-ion Battery 1255

Peng Li, Haiwei Li, Yi Zhang, Shuhua Zhang, Xiaoxiao Zhang, Daidai Chen

Modelling and prediction of thermal error in rotary axis of machine tools under variable working conditions based on TPE-IndRNN 1262

Zhiyang Zhao, Nuodi Huang, Limin Zhu, Xu Zhang, Haifeng Liu

Optimization study of ultrasonic vibration extrusion process parameters for 304 stainless steel shaft parts 1268

Sun Rui, Jia Haili, Wang Yuqin, Cao Yansheng

Structural Design and Analysis of a Novel Dual-Drug Delivery Capsule Robot 1274

Junjie Wang, Hui Yu, Liang Zheng

Thermal Stability Analysis of SiC MOSFET Power Modules 1280

Haochen Xu, Xuesheng Li, Chuan Yang

TA1-3 Humanoid Robot System

Research on Autonomous Navigation System of Agricultural Quadruped Robot 1286

Jie Zhang, Xinyue Wang, Liang Zheng

Modeling and Design of Dynamic Series-parallel Hybrid Lower-limb Mechanism 1291

Zhuo Chen, Zhangguo Yu, Xuechao Chen, Fei Meng, Chencheng Dong, Xin Zhu

Embedded System Design and Implementation of a Humanoid Service Robot 1297

Mingcong Wang, Yisheng Guan, Haifei Zhu, Riyue Wu, Wangcheng Chen, Wenhao Chen, Weichun Xie

A Novel Performance Evaluation and Optimal Design Method for Lower Limb Exoskeleton 1303

Peng Zhang, Junxia Zhang

TP1-3 Mobile Robot System (I)

Research on Segmentation and Clustering Algorithms of 3D Point Clouds for Mobile Robot Navigation 1308
Le Huang, Shuxiang Guo, Chunying Li, Qirong Lei, Jinglei Nie

Design and Simulation of a Self-reconfigurable Modular Wheel-legged Robot 1314
Jun Li, Huaye Wu, Guanqi Li, Chaojun Chen, Huiming Xing

A Study of Lightweight, Low-cost Quadrupedal Robot Body Based on a Coaxial Deformation Mechanism 1320
Zexu Yun, Mengmeng Jing, Yueya Yu, Jiahui Yang, Yuxuan Yang, Shangyan Jiang, Hongwei Zhu, Zihan Yang

Research on Smooth Movement Control and Testing of a Wheeled-Legged Robot 1326
Jingyu Wang, Daming Li, Zhijun Zhao, Wang Jie, Yaobing Wang, Junkai Sun

Online Iterative LQR Controller for Wheeled Bipedal Robot Trajectory Tracking 1334
Yuanfei Xu, Yong Wang

An Alternating Stepping Climbing Machine Based on TRIZ Theory Optimization 1340
Zhifeng Lv, Yubing Duan, Yaowen Zhang, Hanyi Xu, Fengyuan Guo, Zhongjia Zhu, Yahui Wang

TP2-3 Mobile Robot System (II)

Method for Determining Ultra-Wideband Anchor Coordinates in a Cell-splitting Environment for Positioning a Mobile Robot 1347
Rion Omata, Kei Sawai, Tatsuo Motoyoshi, Hiroyuki Masuta, Yotaro Fuse, Myagmardulam Bilguunmaa, Noboru Takagi

Multi UAV Collaborative Target Consensus Detection Using Enhanced Particle Swarm Optimization 1353
Xinhua Wang, Mingzhu Wei, Xiaomei Xie, Hongyu Zhang, Qianqian Huang, Dongjing Song

An Improved Goal-bias RRT algorithm for Unmanned Aerial Vehicle Path Planning 1360
Hongyu Zhang, Xiaomei Xie, Mingzhu Wei, Xinhua Wang, Dongjing Song, Jin Luo

Active Disturbance Rejection Trajectory Tracking Control for Inspection Mobile Robots 1366
Dingji Luo, Yucan Huang, Xuchao Huang, Mingda Miao, Xueshan Gao

A Laser Inertial SLAM System with High Robustness and Low Drift in Complex Environments 1372

Huimin Sun, Jian Liu, Lei Zhang, Hao Sun

Global Path Planning For AUV Based on Improved Grey Wolf Optimization 1379
Juan Li, Haotong Xu, Zhenyang Tian

TP3-3 Mobile Robot System (III)

Deep Reinforcement Learning-Based Swing Suppression Control for Unmanned Multirotor Transportation System 1385
Teng Wang, Shunxuan Wang, Yi Chai, Xiao Liang

Mechanical Design of Out-pipe Detection Mechanisms for Pipeline Defects 1391
Guangyin Nie, Xinhua Zhao, Yihan Ren, Liang Liu

Reinforcement Learning-Based Skill Acquisition Study for Linearly Heated Robots 1397
Zhiliang Zhang, Ryojun Ikeura, Soichiro Hayakawa, Zheng Wang

Design of an active suspension mechanism for obstacle traversal of in-pipe robots 1403
Jiawei Ni, Mingyuan Wang, Liang Du, Sheng Bao, Zhengtao Hu, Jianjun Yuan

Virtual Bipedal Passive Walking Control Based on Target Dynamics 1409
Yixuan Liu, Zhibo Wang, Lishen Pu, Chunquan Xu

TA1-4 Ai and Image Processing(Signal and Image Processing)

FATUnetr:fully attention Transformer for 3D medical image segmentation 1415
Qingfeng Li, Jigang Tong, Sen Yang, Shengzhi Du

Bias-compensated Pseudolinear Kalman Filter for Acoustic Sensor Tracking with Colored Measurement Noise 1420
Huijuan Hao , Zhansheng Duan

A Comparative Study of Linguistic Style between AI Chatbot and Human in Chinese Civil Servant Interview 1428
Yiyang Yu

Bearing Fault Diagnosis Method Based on Multi-Scale Fusion Denoising Capsule Network 1434
Lisha Chen, Youming Wang, Gongqing Cao, Ji Pang, Jiyong Tan

TP1-4 Robot Navigation and Control Algorithm (I)

Forward Kinematics Analysis of 6-PUS Parallel Mechanism based on Optimized BP-NR Algorithm 1440
Wenjing Niu, Xin Guo, Wenyuan Liang, Peng Fang

Improving Formation in Swarm Robotics with a Leader-Follower Approach 1447

Mazen Bahaidarah, Ognjen Marjanovic, Fatemeh Rekabi-Bana, Farshad Arvin

Research on Missile Borne Hemispherical Resonance/ Micro Electromechanical System Gyroscopic Navigation Technology Based on Coarse Fine Coupling 1453
Shiwei Fan, Lixin Zhu, Wei Gao, Ya Zhang, Zhouxing Yin, Kefei Yuan

DOA accuracy improvement method for moving acoustic array 1459
Jihao Zheng, Xuesheng Li, Min Chen, Hangyu Ouyang, Xiaoyao Zhao, Fuyu Tao

The Application of RFID Tags in Library 1465
Yuan Shuo, Hao Xia, Li Peizhuo, Liu Yuhua

InsightSee: Advancing Multi-agent Vision-Language Models for Enhanced Visual Understanding 1471
Huaxiang Zhang, Yaojia Mu, Guo-Niu Zhu, Zhongxue Gan

TP2-4 Robot Navigation and Control Algorithm (II)

Cooperative Navigation System of AGV and UAV with Autonomous and Precise Landing 1477
Yunong Li, Moju Zhao, Junichiro Sugihara, Takuzumi Nishio

Train Coupling Robot Based on Extended Implicit Self-Correction Generalized Predictive Control 1484
Yaning Han, Chengjun Wang, Jianjun Yao

Research on improving the control quality of the flying objects in stabilizing roll angular rate 1490
Dang Thi Dieu Linh, Nguyen Kiem Chien, Pham Van Hung

Study on the Depth Control for an "Egg-shaped" Underwater Robot Based on Backstepping Sliding Mode Algorithm 1496
Haotian Li, Shuxiang Guo, Chunying Li, Jipeng Long

Study on a Novel Fuzzy PID Control System for the Ellipsoidal Underwater Robot 1502
Xueting Liu, Shuxiang Guo, Chunying Li, Qirong Lei, Jinglei Nie

Cable Attitude Detection Technology Based on Rotation Matrix 1508
Wentao Xue, Chaoyue Lin, Chunjie Wang, Peng Chen, Qiang Fu

TP3-4 Manipulator Control and Manipulation (III)

Research on Modeling the Output Behavior of Cable Drive Surgical Instruments 1514
Xingchi Liu, Liqi Wang, Bo Guan, Jianmin Li, Jianchang Zhao

Flexible Belt Constrained Catheterization Robot 1520

Fangxing Tian, Peng Lin, Jianan Hou, Jingyang Sun, Cong Sun, Ming Liang, Hao Liu

Three-Dimensional Dynamic Modeling and Simulation of Guidewire in Vascular Intervention Surgery 1526
Haoyun Wang, Ziyang Mei, Xiaowei Lu, Kanqi Wang, Jingsong Mao, Yang Zhao, Gang Liu

An Occlusion Removal Approach for Surgical Instruments Based on the Optical Flow-Guided Models 1532
Wanqing Wang, Fucheng Liu, Jianxiong Hao, Chaoyang Shi

A Modeling Method Based on Koopman Operator Theory for Omnidirectional Mobile Manipulator System 1538
Dong Wang, Binjie Wang, Tong Zhang, Chao Ren

TA1-5 Haptics Sensors and Devices

Tactile Sensor using Shape-memory Alloy Wires for Human-like Tactile Perception 1544
Hiroki Koeda, Renke Liu, Haruo Igarashi, Hideyuki Sawada

Multimodal Iontronic Tactile Sensor with Intelligent Decoupling Method 1550
Chenxing Mu, Funing Hou, Mengqi Shi, Gang Li, Jixiao Liu, Shijie Guo

Collaborative Hunting Strategy for Multi-Amphibious Spherical Robots in Underwater Environment with Obstacles 1556
Shilong Feng, Shuxiang Guo, Dan Yang, Ao Li, He Yin, Bin Wang, Mingchao Ding

Multi-stage Dynamic Scheduling Optimization for Autonomous Mobility-on-Demand Systems 1562
Hangqi Tian, Ning Wang, Yuntao Guo

TP1-5 Sensor Design and Novel Sensing Systems (I)

A Relative Optimal Evaluation Algorithm Based on Shipborne Anemometer Layout 1568
Zhizhong Lu, Congying Tian, Yuying Zhang

Chipless RFID Sensors for Crack Angle and Direction Detection 1574
Bo Wang, Zhibo Liu

Simulation Modelling of Air Cushion Pressure Detector for Piggyback Transfer Robot 1580
Teng Liu, Xinlong Li, Kaicheng Qi, Jianjun Zhang, Shijie Guo

In-process Monitoring of Penetration Depth and Contact Width During Laser Lap Welding Using Fused OCT Depth and Coaxial High Speed Image 1586
Jinjian Li, Jinhan Zhao, Chaoliang Zhang, Yaoyu Ding, Libing Bai, Yuhua Cheng

Study on Improved D* Lite-Based Obstacle Avoidance and Navigation Strategy for the Ellipsoidal Underwater Robot 1592
Qirong Lei, Shuxiang Guo, Chunying Li, Jinglei Nie

Maximum Deformation Prediction of the Girder of Gantry Crane Based on the Grey Wolf Optimizer-Stacking Ensemble Learning Surrogate Model 1598
Zhikang Jiang, Jianping Dou, Wensheng Su, Pingyuan Wang

TP2-5 Sensor Design and Novel Sensing Systems (II)

An Efficient Depth-tracking Method for Live Control of Laser Drilling Process with Optical Coherence Tomography 1604
Tianyi Zhao, Yuxin Luo, Jinhan Zhao, Hongjie Ren, Hai Xiang, Yifei Liu, Yaoyu Ding

Study on the Path Planning Based on A* Algorithm for Vascular Intervention Robots 1610
Huiyin Xu, Shuxiang Guo, Chunying Li, Sheng Cao

Intelligent compaction quality assessment of vibratory roller using deep neural network 1616
Sinuo Ma, Jianjun Shen, Feng Jia, Liangfan Wu

Data Augmentation for Continuous Excavation Trajectories Based on DGAN 1622
Qianyou Zhao, Duidi Wu, Shuo Zhang, Jin Qi, Jie Hu, Guo-Niu Zhu

Distributed Formation Fault Tolerance Control Based on Improved Artificial Potential Field Method 1628
Wenhui Yang, Xiufen Ye

Error Calibration Analysis of Long Cantilever Inlet Inspection Robot 1634
Guanghong Tao, Xilong Mei, Hongyu Li, Fengchi Tian

TP3-5 Os: Advanced Control Systems and Techniques in Electrical Engineering

Design and Modeling of a Soft Manipulator Driven by Incompressible Fluid 1639
Chang Li, Hanwen Zhou, Yunsai Chen, Mingyu Li, Xincheng Huang, Chenwei Zhang, Shuo Fan

A Joint Adjustment Method for Seafloor Geodetic Control Network with Depth Constraints 1647
Shimei Zhang, Zhenjie Wang, Zhen Sun, Zhixi Nie, Shuang Zhao

Integration of GNSS and Strong Motion Accelerometer based on Robust Adaptive Recursive Noise Kalman Filter by Variational Bayesian Approximations 1653
Yuanfan Zhang, Zhixi Nie, Zhenjie Wang

Online Inductance Identification and Sensorless Control of PMSM Based on a Novel 1659

High-Frequency Square-Wave Injection
Shihan Xu, Yuan Zhu, Ling Meng, Shihua Xu, Kewen Yang

Human-in-the-loop: infusing knowledge into neural networks 1665
Issei Suzuki, Pitoyo Hartono

TA1-6 Mobile Robot System (IV)

Design of a magnetic hemispherical wheeled pipeline robot 1671
Yize Xu, Mingyuan Wang, Liang Du, Sheng Bao, Zhengtao Hu, Jianjun Yuan

Flocking Control Strategy of Multi-underwater Spherical Robot based on Potential Function 1677
Ao Li, Shuxiang Guo, Bin Wang, Mingchao Ding

Evaluation of the Dynamic Performance of a Novel Egg-shaped Underwater Robot 1682
Jipeng Long, Shuxiang Guo, Chunying Li

A mortar scraping robot for a whole wall in construction 1688
Guocai Liu, Zebin Li, Jinsi Zhang, Huifang Bao

TP1-6 Elements, Structures, and Mechanisms (I)

Analysis of the Velocity of Two-Layer Generalized Parallel Manipulators 1694
Chunxu Tian, Zhichao Huang, Hongzeng Li, Fei Chen

Form-finding of Tensegrity Structures via Force Density Matrix Decomposition 1700
Ani Luo, Yaming Feng, Heping Liu, Ziying Cao

Deformation of regular prismatic tensegrity structures under pressure by the analytical method 1706
Ani Luo, Ziying Cao, Yaming Feng, Heping Liu

A subwavelength absorber with labyrinthine structure and adjustable low-frequency properties 1711
Zhonghui Ma, Yingchong Fu, Xiaomei Xie, Xiaoyao Zhao, Wanyou Yang, Min Chen

Experimental Validation of Suspension Structure through Vibration Equivalence 1717
Ke Li, Man Huang, Linfan Yu, Yinan Liu, Yanbo Wang, Xiaogang Xiong, Yunjiang Lou

Design and Development of an Underwater Robot Inspired by Sea Turtles 1723
Xiang Li, Wei He, Jinfeng Li, Dan Xia, Xiang Luo, Yunde Shi, Xiaoqiang Ji, Yuan Yang

TP2-6 Elements, Structures, and Mechanisms (II)

A New Rotor Structure of Permanent Magnet Flat Wire Motors 1729
Meiwei Zhang, Wei Hua

Structural Parameter Selection Strategy of Gripper for Enhanced Gripping Force and Jam Resistance 1735
Kehong Chen, Xuechao Chen, Xin Zhu, Xiaoshuai Ma, Yue Dong

Wall-Sticking Drone for Non-Destructive Inspection of Oblique Planes 1741
Menglong Zhou, Zhi An, Nak Young Chong

Experimental Research on a Water-Jumping Robotic Dolphin Based on Modular Design 1747
Qingyuan Gai, Han Yan, Ming Lei, Dan Xia

Hybrid Control of 3D-Printed Multimodal Soft Pneumatic Actuators 1753
Xuan Tung Le, P. D. S. Hiroshan Gunawardane, Sanjaya Mallikarachchi, Mu Chiao, Isuru S. Godage

Study on the Backstepping Sliding Mode-Based Tracking Control Method for the SUR 1759
Chunying Li, Shuxiang Guo

TP3-6 Manipulator Control and Manipulation (IV)

Collision detection for CoSCARA considering mechanical structure and friction compensation 1765
Pengpeng Wang, Zhiqiang Yang, Hao Lu, Shijie Guo

GameVLM: A Decision-making Framework for Robotic Task Planning Based on Visual Language Models and Zero-sum Games 1771
Aoran Mei, Jianhua Wang, Guo-Niu Zhu, Zhongxue Gan

A Novel Force/Position Control for the Flexible Lower Limb Exoskeleton with Hybrid Actuators 1777
Lei Yu, Zhenkun Sun, Shuai Wang, Cuizhi Fei, Vincenzo Parenti Castelli, Qiaoling Meng, Hongliu Yu

Enhancing Moving Object Segmentation with Spatio-Temporal Information Fusion 1783
Siyu Chen, Yilei Huang, Qilin Li, Ruosong Wang, Zhenhai Zhang

Multi-Mode PID Aircraft Anti-Skid Braking Control System Based on Particle Swarm Optimization 1789
Zheng Wang, Feng Gu, Yiran Tao, Zhongyu Wang, Xin Wang

TA1-7 Os: Biomimetic Underwater Robots

Trajectory Planning for Bipedal Locomotion of a Duck-Inspired Robot 1795
Shuhui Zhang, Yan Niu, Yiran Xu, Xinru Lin, Shuxiang Guo, Liwei Shi

Correlation Analysis Between Waterfowl Swimming Behavior and Propulsion Efficiency 1801
Yiran Xu, Xinru Lin, Shuhui Zhang, Shuxiang Guo, Liwei Shi

Design and Performance Evaluation of a Three-Dimension Triphibian Robot Propulsion Unit Based on Electric Ducted Fan Engine 1807
Yingduo Chen, Shuxiang Guo, He Yin, Ao Li, Bin Wang, Mingchao Ding

Motion Control of A Noval Bipedal Wheeled Robot:VC-I 1813
Yi Wang, Yong Ding, Yong Wang

TP1-7 Signal and Image Processing (III)

Road Marking Damage Degree Detection Based on Adaptive Feature Fusion 1819
Zheng Wang, Ryojun Ikeura, Soichiro Hayakawa, Zhiliang Zhang

Two-stage detection algorithm of train key bolts based on YOLO and Faster R-CNN 1824
Jiayang Qin, Zhong Huang, Wenteng Xu, Kaiying Han, Biliu Wang, Duo Zhao

Deep Learning-Guided Single-Cell Encapsulation through photo-crosslinking for Advanced 3D Culture 1831
Yanfeng Zhao, Kaijun Lin, Haotian Yang, Xinyi Dong, Tao Sun, Qing Shi, Qiang Huang, Huaping Wang

DADETR: Feature Alignment-based Domain Adaptation for Ship Object Detection 1837
Junbao Wu, Hao Meng

PFSC:Pyramid R-CNN for Point-Voxels with Focal Sparse Convolutional Networks for 3D Object Detection 1843
Zhao Su, Xuehui Liang, Jigang Tong, Sen Yang, Shengzhi Du

LiDAR-based human pose estimation with MotionBERT 1849
Zichen Zhao, Chao Zhuang, Jian Li, Hao Sun

TP2-7 Signal and Image Processing (IV)

Flexible Calibration for Digital Fringe Projection Profilometry 1855
Yi Xiao, Jiachen Liu, Hongmei Zhong

Improved DRAEM: Enhance the Unsupervised AD in Defect Segmentation 1861
Yuhao Jiang, Bingguo Liu, Hangcheng Dong, Shuwen Yang, Guodong Liu

Research on Target Localization Technology based on Depth of field fusion of generative adversarial networks 1868
Lingfeng Qiao, Guodong Liu, Cheng Lu, Binghui Lu

Research on Mediated Control Strategy of Hybrid Power System 1875
Junliang Ge, Feng Ren, Xin Wang

Nonlinear Model Predictive Control for Structural Reliable Position-Mooring of FPSO based on Nonlinear Extended State Observer 1880
Ting Wang, Zhilin Liu, Xiaoyue Zhang, Yingkai Ma

Application of artificial intelligence in magnetic performance prediction of sintered Nd-Fe-B magnets 1886
Qinglang Zhou, Xiaodong Xing, Shuyong Jiang, Nan Dong

TP3-7 Control Theory and Application (III)

The Harmonic Optimization of High-Power Converter Based on The LLCL Filter 1891
Rui Dong, Qiang Fu, Chunjie Wang, Lin Cui

Design of Three-Phase Fully Controlled Type Rectifier Controller for Electrolytic Hydrogen Production System 1897
Yushi Liang, Qiang Fu, Chunjie Wang, Lin Cui

Dynamic Analysis of Jumper Cables for Offshore Floating Photovoltaic System 1903
Shundi Hu, Qiang Fu, Chunjie Wang

Design of wireless charging system for underwater robot 1908
Jiazhe Deng, Qiang Fu, Chunjie Wang, Mengmeng Liu

Kinematic Simulation of Serpentine Soft Robotic Arm 1914
Yongshuang Ma, Qiang Fu, Peng Chen