

2023 8th International Conference on Control, Robotics and Cybernetics (CRC 2023)

**Changsha, China
22-24 December 2023**



**IEEE Catalog Number: CFP23J10-POD
ISBN: 979-8-3503-3059-5**

**Copyright © 2023 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:	CFP23J10-POD
ISBN (Print-On-Demand):	979-8-3503-3059-5
ISBN (Online):	979-8-3503-3058-8

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

CURRAN ASSOCIATES INC.
proceedings
.com

2023 the 8th International Conference on Control, Robotics and Cybernetics

(CRC 2023)

Table of Contents

Preface	viii
Conference Committees	ix

✧ Visual Based Intelligent Robots Collaborative Control and Operation

CREPES2: A Dynamic Position and Pose Estimation System	1
<i>Zhenjun Ying, Qinghua Zhou</i>	
Fruit Distribution Acquisition with Multi-Vision for Multi-Arm Harvesting Robots	7
<i>Feng Xie, Na Sun, Jiaheng Li, Qingchun Feng, Tao Li</i>	
Autonomous Traversing across Floors Based on Vision for Reconfigurable Tracked Robot	14
<i>Hanbin Xie, Qinghua Zhou</i>	
Second-Order Leader-Following Consensus of Multi-Robot Systems under Limited Visual Feedback	20
<i>Jiahao Chen, Kaidi Liu, Yiran Liu, Guoliang Zhai, Taogang Hou, Xuan Pei</i>	
Research on Fusion Navigation Method of Electrolytic Aluminum Sample Transfer Robot	27
<i>Junhang Wu, Shaosheng Fan, Zhifei Wei, Xunhao Tang</i>	
A Structured Scene-Oriented SLAM System Based on Low-Cost Multi-Sensor Fusion	32
<i>Chao Feng, Zhiwei Jia, Wupeng Zhang</i>	
Research on the Application of Intelligent Robots in Procurement Management	37
<i>Chenggong Zhai, Fan Jiang, Shan Chen, Han Qiu, Liyong Zhou, Chi Ma</i>	

✧ Electrical Equipment Operation Control and Health Status Monitoring

Aerial High Speed Scooping	42
<i>Marinus Johannes Sewalt, Kam Tim Woo</i>	
Real-Time Solvable Model Predictive Control with Adjustable Factors for Bipedal Robots	47
<i>Qionghua Xia, Zitian Zheng, Zhengyong Feng, Huaibing Qi</i>	
Research on SLAM Intelligent Robot Based on Visual Laser Fusion	53
<i>Juan Lin, Taopin Liang, Guoqiang Ma, Binghao Li, Tianyang Yu</i>	

Characterization of Core Researches on Iterative Learning of Robot: A Bibliometric Analysis	58
<i>Xianghong Chen, Yunyun Zhang, Bo Xie, Ting Zhou, Shulin Liu, Ligui Xiong</i>	
Stable Robotic Grasping with Center-Guided Grasp Pose Estimation	63
<i>Jieren Deng, Jianhua Hu, Haojian Zhang, Yunkuan Wang</i>	
Fall Recovery Strategies in Humanoid Robots: A Brief Survey	68
<i>Boya Zhang, Ming Jia</i>	
✧ Intelligent Control Design and Functional Evaluation	
Design and Implementation of Open Multi-axis Motion Control System Based on Xenomai	73
<i>Xingzu Han, Di Li, Minghao Cheng</i>	
Backstepping-Based Adaptive Control of Indoor Miniature Airship	81
<i>Hongming Li, Yongchun Fang, Jinyang Dong, Hai Yu</i>	
A Lightweight and Convenient Exoskeleton Hand for an Electrothermal Microgripper in Teleoperation	87
<i>Guoning Si, Hanli Zhang, Zhuo Zhang, Xuping Zhang</i>	
A Multimodal Construction Method for a Digital Twin System with Human-Robot Collaboration	92
<i>Yuchen Ji, Zequn Zhang, Dunbing Tang, Changchun Liu, Zhen Zhao, Qili Cao</i>	
A Conceptual Framework for the Development of Autonomous Driving in 6G: the Role of AI and Edge Computing	97
<i>Maria-Dolores Cano, Antonio Guillen-Perez, Igor Tasic, Antonio Villafranca</i>	
Design of Trading Mode and Decision-Making for Independent Energy Storage Participating in in-Depth Peak Regulation.....	106
<i>Xiaodan Liu, Yang Li, Jing Liao, Yuanfu Tang, Binkun Xu, Sheng Xiang, Wei Meng, Ke Meng</i>	
✧ Intelligent System Coordination Control and Operation	
Design of a Material Traceability System for Multi-star Batch Production	112
<i>Liu Weijing, Zheng Tingting, Qu Jiajie, Cheng Xiao, Xu Wenli, Dang Xing</i>	
A Safe Shared-Control Framework for Dual-Arm Collaborative Telemanipulation	120
<i>Dongsheng Ge, Huan Zhao, Yanjia Chen, Zhenyu Wang, Han Ding</i>	
Mutual Sensor Task Assignment and Distributed Track Fusion Method for Multi-UAV Sensors	127
<i>Guo-jie Qin, Jinrong Liu, Peng Xu</i>	
Design of Fixed-Time Scaled Tracking Consensus Protocol for Second-Order Multi-agent Systems	132
<i>Zihan Xiao, Hanlan Zhang</i>	

✧ **Electrical Equipment Status Assessment and Safety Failure Control**

220kV High Voltage Cable Explosion-proof joint Leakage Hole Size Design	139
<i>Qiu Wei, Chen Tao, Xiong Tingting, Yuan Haoqi, Chen Yangning, Yang Xin</i>	
Identification and Control of Distribution Transformer Inrush Current	144
<i>Bozhong Cao, QinYa Qi, Yi An, Chun Chen</i>	
220kV Explosion-Proof Cable Joint Copper Shell End Circular Arc Design	150
<i>Li Chen, Huang Yuhua, Qiu Wei, Cui Jiangjing, Qin Rui, Yang Xin</i>	
Cascaded Structural State Observer Considering Interlayer Closure Error Minimization	154
<i>Menglong Wang, Ling Li, Kaixuan Lan, Zhuofu Pan</i>	

✧ **Operation Control and Reliability Evaluation of Power Electronic Equipment**

Circulating Currents Suppression PWM Strategy for Paralleled Inverters Based on Common Mode Voltage Reduction.....	159
<i>Genping Wu, ShiBo Xiong, Hanshu Zhang, Rong Yan</i>	
An Innovative Approach to Multi-Objective Infrared Temperature Measurement for Electrical Power Equipment Using K-Means.....	165
<i>Heye Wang, Xiongjun Shang, Qi Xiong, Jiahao Liang, Yangyang Huang</i>	
The Shape Design of Energy Leakage Hole of 220kV High Voltage Cable Explosion-Proof Joint	172
<i>Qiu Wei, Li Chen, Huang Yuhua, Cui Jiangjing, Yuan Haoqi, Yang xin</i>	
YOLOv8-SC: Target Detection Algorithm of Live Detection System for Tensioning Clamps in High- Voltage Transmission Lines.....	177
<i>Wupeng Zhang, Zhiwei Jia, Chao Feng, Mengyuan Chen</i>	
220kV Explosion-proof High-voltage Cable Joint end Folding Corner Design.....	182
<i>Qiu Wei, Li Chen, Huang Yuhua, Cui Jiangjing, Gao Xiang, Yang Xin</i>	
Design and Experimental Validation of a Microgripping Force Detection Mechanism.....	186
<i>Guoning Si, Zhixin Zhao, Zhuo Zhang, Xuping Zhang</i>	

✧ **Modern Electronic Component Design and Development**

The Temperature Distribution Law of Dry-Type Air-Core Reactor and the Layout Scheme Design of Encapsulated Temperature Sensor	190
<i>Shuang Lu, Xin Yang, Haocong Li, Yizhe Jiao, Xiu Zhou, Tian Tian</i>	
Novel Energy Storage Devices Operation Control Strategy Based on Spot Market	196
<i>Xiaodan Liu, Yuanfu Tang, Yang Li, Jing Liao, Binkun Xu, Sheng Xiang, Yuqing Liu, Ke Meng</i>	

Dry-Type Air-Core Smoothing Reactor Based on Interturn Insulation Thickness Design.....	202
<i>Yawei Liu, Xin Yang, Haocong Li, Shuang Lu, Xiu Zhou, Jin Bai, Tian Tian</i>	
Enhancing Observer Performance with Gaussian Processes: A Noise-Resilient High-Gain Approach	207
<i>Dexin Zhang, Shunxin Tian</i>	
HPViT: A Hybrid Visual Model with Feature Pyramid Transformer Structure.....	212
<i>JiaXiong Li, Hongguang Xiao, Yongzhou Li</i>	
✧ Data Driven Intelligent Computing and Information Management	
Supply Chain - Supplier Evaluation Using the Fuzzy SWARA and Fuzzy COPRAS Methodologies for Macro and Micro Supplier Companies: Peru Case Study	217
<i>Fabiola Sotelo Rivera, Dayana Estefany Rodríguez Sanabria, Elvia Irene Castellares Huaylinos, Alex Estanislao Galván Quispe</i>	
Optimization Algorithm for Link Time Based on Function Reordering	222
<i>Qingli Li, Yagang Wang, Jiachen Chang</i>	
Integration of Lean Six Sigma with Value Stream Mapping and Simulation to Increase Productivity in a Gelatinized Maca Production Plant: A Case Study	230
<i>Pamela Lucia Riera Huaman, Ruben Dario Arzapalo Bello</i>	
Misconduct in Post-Selections and Deep Learning	235
<i>Juyang Weng</i>	
How Can Geostatistics Help Us Understand Deep Learning?	244
<i>Zhenhuan Fang, Lifu Chen, Jin Xing, Xingmin Cai</i>	
Price Modeling and Influencing Factors Analysis of STATE GRID APP Mechanism.....	248
<i>Yang Li, Binkun Xu, Anrong Gong, Ke Meng, Shengjie Geng, Sheng Xiang</i>	
✧ Image Detection and Recognition	
Cervix Visionator ELM: A Novel Approach to Early Detection of Cervical Cancer	254
<i>Khowaja Ashfaq, Zou Bei.Ji, Xiaoyan Kui</i>	
Chinese Entity Recognition for Cloud Manufacturing Knowledge Graph Construction	260
<i>Long Ding, Yi Zhang, Haihua Zhu, Dunbing Tang</i>	
The Analysis of Person Re-Identification Used in Unmanned Aerial System	265
<i>Lin Du, Jiancheng Qi, Dianxiong Liu, Tianyun Gao</i>	
ILFMT-LS: Specific Target Detection in Mobile Crowds Based on Deep Learning	270
<i>Ao Zheng, Maojun Li, Dingxiang Wang, Chang You, Yawu Liu, Xudong Zeng</i>	

A Unified Binary Classification Network for Weld Image Detection	275
<i>Jingli Gao, Mengya Zhang, Li Ma, Miao Huang, Zhen Li</i>	
MSIF-Net: Multi-branch Semantic Information Fusion Network for Automatic Bare Soil Detection in High-Resolution Remote Sensing Images	280
<i>Junqi Zhao, Lifu Chen, Yawu Liu, Yuchen Jin, Haoda Chen, Zhenhuan Fang</i>	
✧ Intelligent Image Analysis and Processing Technology	
SGN: Semantic-Guided Net for 3D Semantic Segmentation in Cluttered Scenes	285
<i>Zihao Wan, Jianhua Hu, Yunkuan Wang</i>	
Research of Extended Dimension Embedded CKFSLAM Base on Truncated Singular Value Decomposition	290
<i>Shibo Zheng, Kai He, Shuo Meng, Fangchencan Liu, Qiang Guo</i>	
Classification Method of Visual-Tactile Fusion Dataset Based on CNN-TCN	295
<i>Hanyuan Li, Haibo Zhang</i>	
Point Cloud and Image Data Fusion Methods Based on the Least Squares Method.....	301
<i>JiaCheng Li, Qing He</i>	
Fusion of Visual Odometry Information for Enhanced Camera Pose Estimation	306
<i>Jing Wang, Yibo Wang, Cheng Guo, Shujun Xing, Xing Ye</i>	
Joint Contrastive Learning for Image Clustering	310
<i>Yuxuan Yan, Lu Na, Ruofan Yan</i>	
An Improved SAR Image Simulation Method for the Lunar Surface using Refined Terrain Modeling Derived from LROC Stereo Data.....	315
<i>Ya-Ting Zhou, Yongsheng Zhou, Bo Zhu, Fei Ma, Qiang Yin, Fan Zhang</i>	
Fast Registration of High-Resolution Optical-SAR Images Based on Grayscale Normalized Mutual Information	320
<i>Minghao Wang, Boli Xiong, Qing Guo, Yujie Zhou</i>	
MFAP-Net: A Study on Deep Learning Semantic Segmentation Framework for LiDAR Point Clouds	326
<i>Yawu Liu, Lifu Chen, Bingnan Wang, Maosheng Xiang, Haoda Chen, Junqi Zhao</i>	

Author Index