

2024 8th International Conference on Robotics and Automation Sciences (ICRAS 2024)

**Tokyo, Japan
21-23 June 2024**



**IEEE Catalog Number: CFP24L72-POD
ISBN: 979-8-3503-5251-1**

**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:	CFP24L72-POD
ISBN (Print-On-Demand):	979-8-3503-5251-1
ISBN (Online):	979-8-3503-5250-4
ISSN:	2694-3514

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

2024 8th International Conference on Robotics and Automation Sciences

(ICRAS 2024)

Table of Contents

Preface	v
Committees	vi
<hr/>	
➤ Design and Control of Mobile Robots	
A Method of Robot DH Parameter Calibration Based on the Genetic Algorithm	1
<i>Tao Zhang, Boqiang Zhang, Zejun Sun</i>	
Mitigating the Trade-off between Robustness, Optimality, and Sample Efficiency in Simulated Legged Locomotion	6
<i>Pratham Patil, Rishab Agrawal, Samuel Thomas, Thejaswi A., T. S. Chandar</i>	
Design and Analysis of Novel Wall-Climbing Robot on Discontinuous Ferromagnetic Surface	14
<i>Bo Zhong, Qi Lan, Wencong Lian, Peng Sun, Hao Chen, Yong Lei</i>	
Person Tracking Control of Mobile Robots Using A Lightweight Object Detection and Tracking System	21
<i>Yu-Chen Chiu, Huan-Wei Hsu, Chi-Yi Tsai</i>	
Optimization-Based Trajectory Planning for Multiple Robots in Unstructured Environments	26
<i>Lixiang Zheng, Gang Zhang, Zhangduan Chai, Jie Niu, Chengran Lin</i>	
Robot Path Planning Optimization Based on RRT and APF Fusion Algorithm.....	32
<i>Sanli Fu</i>	
➤ Intelligent Robot System and Functional Analysis	
Exploring Child-Robot Interaction in Individual and Group Settings in India	37
<i>Gayathri Manikutty, Sai Ankith Potapragada, Devasena Pasupuleti, Mahesh S. Unnithan, Arjun Venugopal, Pranav Prabha, Arunav H., Vyshnavi Anil Kumar, Rthuraj P. R., Rao R. Bhavani</i>	
Digital Twin of Industrial Robots over the Cloud: Framework, Design and Analysis	43
<i>Hari Ganesan, Aaryan M. Sandeep, Aakash Negi, Yuktha M., Ashok Kumar Patil</i>	
MATLAB Toolbox for Reachability Analysis and Visualization of Robotic Manipulators	49
<i>Pooyan Nayyeri, Kouros Zareinia, Habiba Bougherara</i>	
An Improved RRT* Algorithm for Multi-objective Optimization Based on NSGA-III.....	55
<i>Wang Chu, Liu Zhongze, Cao Shunxiang, Hu Kai, Zhang Yibo, Xiang Dong, Zhou Weiye</i>	
Enhancing Robotic Task Parameter Estimation through Unified User Interaction: Gestures and Verbal Instructions in Collaboration	66
<i>Shuvo Kumar Paul, Mircea Nicolescu, Monica Nicolescu</i>	
Research on Multi-objective Optimization of Grinding Robots Based on Multi-Verse Optimizer	72
<i>Tao Zhang, Tianchen Peng, Shun Zhang</i>	

➤ Machine Vision and Image Processing	
Enhancing Automatic Microplastic Detection Through Density Separation and HSV Color Processing	79
<i>S. Chokchaitam, P. Kaewprapha, W. Chainam, C. Pattama, S. Phitaktim</i>	
Switching of Assist Motion by Voice Recognition for Exoskeleton that Supports Lifting and Walking	84
<i>Chiharu Ishii, Takahiro Yamashita</i>	
Traffic Sign Classification Using Attention Fused Deep Convolutional Neural Network	90
<i>Shravan Venkatraman, Abeshek A., Santhosh Malarvannan, Shriyans A., Jashwanth R., Joe Dhanith P. R.</i>	
➤ Complex System Design and Functional Control	
Implementation of Water Surface Objects Ranging System for Collision Warning.....	95
<i>Ren-Jie Huang, Chun-Shun Tseng, Wen-Chung Chen, Tsung-Ping Tu, Teng-Fu Huang, Cheng-Chun Lin, Pin-Han Chen</i>	
3D Lidar Technology for Slag Flushing of BF in Auto Crane	101
<i>Jing Chen, Bing Han, Dong Liu</i>	
Autonomous Sensor-based Control of Aerial Manipulator for Horizontal Pipe Structure Tracking with Continuous Contact	106
<i>Naisarg Pandya, Amit Shukla, Pushkar Kumar, Ankit Mehra</i>	
A Teleoperation Framework for Upper Limb Rehabilitation Based on Improved Dynamic Movement Primitives and Hybrid Control.....	114
<i>Zhixuan Shi, Jing Luo</i>	
Fault Detection and Diagnosis Based on Ant Colony Algorithm	122
<i>Gula Da, Jinxing Zhao</i>	
Structural Design/Manufacturing and Cavitation Efficiency Calculation of the Bio-inspired Snapping-claw Apparatus	128
<i>Hang Yin</i>	
➤ Modern Electronic Systems and Control Technology	
Design of Synchronized Pulse Signals for Bump Magnet Power Supply with FPGA-Based System.....	134
<i>Surapong Kokkrathoke, Nattawat Yachum, Somjai Chunjarean, Keerati Manasatitpong, Natthawut Suradet, Apichai Kwankasem</i>	
Artificial Intelligence-based Error Detection and Adaption of Shot Curve Parameters in the Hot Chamber High-pressure Die Casting Process.....	140
<i>Tobias Stempfle, Christos Mangos, Sebastian Feldmann, Lothar Kallien, Manfred Rössle, Johann Jung</i>	
Nonlinear Output Voltage Control of Triboelectric Nanogenerator System	151
<i>Ryusei Shimane, Mingcong Deng, Guang Jin</i>	
Implementation of Water Cooling System Control of 6-MeV Linear Accelerator for Fruit Sterilization	157
<i>Nattawat Yachum, Surapong Kokkrathoke, Somjai Chunjarean, Keerati Manasatitpong, Nilaped Russamee</i>	
Hybrid Particle Swarm Optimization with Quasi-Newton Local Search for Quadrotor Altitude and Attitude Control.....	161
<i>Ishaq Hafez, Rached Dhaouadi</i>	
➤ Author Index	