

2023 8th International Conference on Control and Robotics Engineering (ICCRE 2023)

**Niigata, Japan
21 – 23 April 2023**



**IEEE Catalog Number: CFP23JAA-POD
ISBN: 979-8-3503-4566-7**

**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:	CFP23JAA-POD
ISBN (Print-On-Demand):	979-8-3503-4566-7
ISBN (Online):	979-8-3503-4565-0
ISSN:	2835-3714

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

2023 8th International Conference on Control and Robotics Engineering (ICCRE)

Preface	vii
Conference Committees	viii

Algorithm Design and Model Analysis

A Hybrid Bayesian Network Structure Learning Algorithm in Equivalence Class Space	1
<i>Xiaohan Liu, Xiaoguang Gao, Xinxin Ru, Zidong Wang</i>	
A Comparative Study on Grid-Based and Non-grid-based Path Planning Algorithm.....	5
<i>Arindam Ghosh, Muneendra Ojha, Krishna Pratap Singh</i>	
Bayesian Network Structure Learning Algorithm Based on Score Increment and Reduction	11
<i>Xiaoguang Gao, Xuchen Yan, Zidong Wang, Xiaohan Liu</i>	
Toxicity Detection Using State of the Art Natural Language Methodologies.....	16
<i>Enes Faruk Keskin, Erkut Açıkgöz, Gulustan Dogan</i>	
Research on Deep Spatio-Temporal Model and Its Application in Situation Prediction.....	21
<i>Qi Feng, Jinhui Zhang, Xiaoguang Gao, Maoqing Li, Chenxi Ning</i>	

AI-Based Smart Model and Calculation

An End-to-End Pose Estimation Network for Multiscale Space Non-cooperative Objects	28
<i>Yi Cao, Xianghong Cheng</i>	
Better Multi-step Time Series Prediction Using Sparse and Deep Echo State Network	34
<i>Kristsana Seepanomwan</i>	
An EMG-Based Teleoperation System with Small Hand Based on a Dual-Arm Task Model.....	40
<i>Taro Shibanoki, Kosuke Jin, Masaki Maeda</i>	
A Bi-LSTM and AutoEncoder Based Framework for Multi-step Flight Trajectory Prediction	44
<i>Han Wu, Yan Liang, Bin Zhou, Hao Sun</i>	
A Digital Twin-Based Production-Maintenance Joint Scheduling Framework with Reinforcement Learning	51
<i>Qinglong Hao, Yaqiong Lv</i>	

A Feature Structure Based Interpretability Evaluation Approach for Deep Learning	57
<i>Xinyu Li, Xiaoguang Gao, Chenfeng Wang, Qianglong Wang</i>	

Pattern Recognition of Partial Discharge Faults Using Convolutional Neural Network (CNN).....	61
<i>Jakrin Butdee, Waree Kongprawechnon, Hiroki Nakahara, Nattapon Chayopitak, Cherdak Kingkan, Ruchao Pupadubsin</i>	

Machine Vision and Intelligent Image Analysis

Visual Feedback Control of Print Trajectory in FDM-Type 3D Printing Process.....	67
<i>Shinichi Ishikawa, Ryosuke Tasaki</i>	

Automatic Detection of Natural Disaster Effect on Paddy Field from Satellite Images Using Deep Learning Techniques.....	72
<i>Tahmid Alavi Ishmam, Amin Ahsan Ali, Md Ahsraful Amin, A K M Mahbubur Rahman</i>	

Monocular Object Detection & Localization on a 2D Plane Adapted to 360° Images without Retraining.....	78
<i>Ahmed Farid, Osamu Yoshie</i>	

Dance Gestures Recognition for Wheelchair Control	84
<i>Juan Martinez Rocha, Jhedmar Callupe Luna, Eric Monacelli, Gladys Foggea, Maflohé Passedouet, Stéphane Delaplace, Yasuhisa Hirata</i>	

An Interpretable Deep Bayesian Model for Facial Micro-Expression Recognition	91
<i>Chenfeng Wang, Xiaoguang Gao, Xinyu Li</i>	

High-Value Fruit Biometric Identification via Triplet-Loss Technique.....	95
<i>Plaifah Laimek, Waree Kongprawechnon, Teera Phatrapornnant, Tsuyoshi Isshiki</i>	

DLVS: Time Series Architecture for Image-Based Visual Servoing	101
<i>Nilesh Aggarwal, Anunay, Vayam Jain, Tushar Singh, Dinesh Kumar Vishwakarma</i>	

Intelligent Control Intelligent Design and System Simulation

An Improved Particle Filtering Strategy for Terrain Aided Navigation Based on MBES Information	108
<i>Shaohua Pan, Xiaosu Xu, Yiqing Yao</i>	

Simulation System of Underwater Manipulator Based on Gazebo	115
<i>Ping Deng, Pu Zhang, Zheng Gong, Le Li</i>	

Estimating the Maximum Pushing Force of Robot Manipulators to Physically Assist Caregivers.....	121
<i>Christian Kowalski, Sandra Hellmers, Pascal Hinrichs, Andreas Hein</i>	

Impact, Attention, Influence: Early Assessment of Autonomous Driving Datasets.....	128
<i>Daniel Bogdoll, Jonas Hendl, Felix Schreyer, Nishanth Gowda, Michael Färber, J. Marius Zöllner</i>	

A Fast Anti-Rocking Self-Alignment Method for Strapdown Inertial Navigation Systems under Latitude Uncertainty	137
<i>Wenqian Liu, Xianghong Cheng</i>	

Camera Image Based Moving Platform Rotation Estimation for Quadrotor Landing	143
<i>Joonyoung Jang, Miguel Angel Martinez Macias, Thomas Bewley</i>	

Environmental Monitoring System with Wireless Sensing and IoT Technologies for Intensive Care Units.....	150
<i>Sofía Alejandra Solano Girón, Blanca Azucena Camacho Morales, Fernanda de Lourdes Cáceres Lagos, Favell Eduardo Núñez Rodríguez</i>	

Control System Design and Functional Test

Intelligent Hermite Neural Control for Reaction Wheel Inverted Pendulums.....	156
<i>Chun-Fei Hsu, Bo-Rui Chen</i>	

Design and Analysis of Adaptive Compliant Gripper Mechanism Based on Antagonistic Actuator System.....	161
<i>Shreyas Sharma, Hiroyuki Harada</i>	

Performance Evaluation of an Adaptive Sigmoid Friction Compensation for Pneumatic Trajectory	165
<i>K. N. Kamaludin, L. Abdullah, S. N. S. Salim, Z. Jamaludin, T. H. Chiew, M. N. Kamarudin, M. S. M. Aras, M. F. Rahmat</i>	

Inverse Kinematics of Six-Joint Special Manipulators.....	172
<i>Saraleen Mae Manongsong, Jose Capco</i>	

An Assessment of Predictive Control Strategies for Lateral Stability Control of 4-Wheels Drive Electrical Vehicle...	177
<i>Ahmed Hassan, Jose Ramon D. Frejo, Jose Maria Maestre</i>	

Robot Movement Control and Path Planning

GarRobot: Design, Construction and Control of a Teleoperated Climbing Robot Inspired by Geckos	183
<i>Naomi Isabel López Ayala, Jose Carlos Aguilar Altamirano, Alicia María Reyes Duke</i>	

A Study on the Application of ORBSLAM3 on a Mobile Differential Drive Robot	189
<i>Siong Yuen Kok, Wei Wei Yu, Danny, Wee Kiat, Ng</i>	

Motion Control of Liquid Containers with Slosh Constraints during High-Speed Three-Dimensional Transfer	194
<i>Ryuji Nakagawa, Takahito Yamashita, Ryosuke Tasaki</i>	

Constrained Motion Planning for a Robotic Endoscope Holder Based on Hierarchical Quadratic Programming.....	198
<i>Jacinto Colan, Ana Davila, Yasuhisa Hasegawa</i>	

Deep-Reinforcement-Learning-Based Path Planning for Industrial Robots Using Distance Sensors as Observation ...	204
<i>Teham Bhuiyan, Linh Kästner, Yifan Hu, Benno Kutschank, Jens Lambrecht</i>	

Mobile Robot Model Predictive Control Approach: Case Study of an Irrigation Canal	211
<i>Roza Ranjbar, Javier G. Martin, Jose M. Maestre, Lucien Etienne, Eric Duviella, Eduardo F. Camacho</i>	

Vibration Suppression Control System for High-Speed Transfer-Robot with Adjustable Length Loading Arm	217
<i>Yuichiro Yamamoto, Takahito Yamashita, Yusuke Kumagai, Ryosuke Tasaki</i>	

Function Robot and Control System Analysis

Design and Fabrication of a Quadruped Zoomorphic Robot and Its Mathematical Model Using Denavit-Hartenberg Algorithm	221
<i>Abelardo José Banegas Dubón, Alejandro Jaffet Cribas Ramos, José Luis Ordoñez-Avila</i>	
Industrial Modeling Design of Lower Limb Rehabilitation Robot System Based on AHP and Fuzzy Evaluation.....	227
<i>Yuyu Shu, Yan Xing</i>	
Low Cost Object Tracking by Computer Vision Using 8 Bits Communication with a Viper Robot	232
<i>Leonel Alejandro Cruz Sandoval</i>	
Statics and Dynamics Simulation Analysis of the Industrial Robot Arm Structure Based on the Generative Design ...	238
<i>Duong Xuan Bien, Mai Ngoc Anh, Nguyen Thi Ngoc Mai, Vu Thi Doan Trang, Le Thanh Binh, Dao Van Duong, Pham Dac Phong, Do Duy Nhat</i>	
Design of a Hand Rehabilitation Exoskeleton Prototype for Patients Affected by Osteoarthritis.....	244
<i>Roberto Enrique Domínguez, Allison Sarahi Oviedo Iraheta, Manuel Adalid Gamero V.</i>	
Control Design and Implementation of Robotic Massage Based on Finger Pressing Motion Analysis.....	250
<i>Naoya Harada, Takuma Akiduki, Michiteru Kitazaki, Ryosuke Tasaki</i>	
Development of a 2D Measurement System for Implementation in Robots Used for Industrial Parts Verification	254
<i>Delond Angelo Jimenez-Nixon, Maycool Jonas Artica-Zelaya, Marcio Javier Paz-Cardona</i>	
Task Segmentation Based on Transition State Clustering for Surgical Robot Assistance	260
<i>Yutaro Yamada, Jacinto Colan, Ana Davila, Yasuhisa Hasegawa</i>	
Author Index.....	265