

# **2022 IEEE International Symposium on Robotic and Sensors Environments (ROSE 2022)**

**Abu Dhabi, United Arab Emirates  
14-15 November 2022**



**IEEE Catalog Number: CFP22549-POD  
ISBN: 978-1-6654-8924-9**

**Copyright © 2022 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:	CFP22549-POD
ISBN (Print-On-Demand):	978-1-6654-8924-9
ISBN (Online):	978-1-6654-8923-2

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# TABLE OF CONTENTS

Highly Accurate Positioning Method for Car-Like Robots Utilizing a Monocular Camera and QR Code Tracking .....	1
<i>Christoph Rohmann, Jens Lenkowski, Harald Bachem, Bernd Lichte</i>	
A Learning-Based Approach for Bias Elimination in Low-Cost Gyroscopes .....	8
<i>Daniel Engelsman, Itzik Klein</i>	
Temporal Difference Learning of Area Coverage Control with Multi-Agent Systems.....	13
<i>Farzan Soleymani, Suruz Miah, Davide Spinello</i>	
Image Classification and Text Identification in Inspecting Military Aircrafts Logos: Application of Convolutional Neural Network .....	21
<i>Saleh Edhah, Abeer Awadallah, Mayar Madboly, Hamdihun Dawed, Naoufel Werghi</i>	
Image-Based Obstacle Avoidance Using 3DConv Network for Rocky Environment .....	27
<i>Abderrahmene Boudiaf, Ameena Al Sumaiti, Jorge Dias</i>	
Superordinate Safety System for Human Robot Interaction in Complex Industrial Environment .....	34
<i>Mohamad Bdiwi, Sebastian Krusche, Jayanto Halim, Steffen Ihlenfeldt</i>	
Situational Zone-Based Robot Control for Heterogeneous Safety Sensors in Agile HRI Applications.....	41
<i>Mohamad Bdiwi, Sebastian Krusche, Jayanto Halim, Paul Eichler, Shuxiao Hou, Aquib Rashid, Ibrahim Al Naser, Steffen Ihlenfeldt</i>	
JUPITER – ROS Based Vehicle Platform for Autonomous Driving Research.....	48
<i>Johann Haselberger, Marcel Pelzer, Bernhard Schick, Steffen Müller</i>	
UWB Role Allocation with Distributed Ledger Technologies for Scalable Relative Localization in Multi-Robot Systems.....	56
<i>Paola Torrico Morón, Salma Salimi, Jorge Peña Queralta, Tomi Westerlund</i>	
Accurate Embedded Force Sensor for Soft Robots with Rate-Dependent Deep Neural Calibration .....	64
<i>Tannaz Torkaman, Majid Roshanfar, Javad Dargahi, Amir Hooshidar</i>	
Transformers for Imbalanced Baggage Threat Recognition.....	71
<i>Divya Velayudhan, Abdelfatah Hassan Ahmed, Taimur Hassan, Mohammed Bennamoun, Ernesto Damiani, Naoufel Werghi</i>	
Path Planning of Cleaning Robot with Reinforcement Learning .....	78
<i>Woohyeon Moon, Bumgeun Park, Sarvar Hussain Nengroo, Taeyoung Kim, Dongsoo Har</i>	
A Hybrid Deep Learning Approach for Vehicle Wheel Slip Prediction in Off-Road Environments.....	85
<i>Mustofa Basri, Areg Karapetyan, Bilal Hassan, Majid Khonji, Jorge Dias</i>	
A Metrological and Application-Related Comparison of Six Consumer Grade Stereo Depth Cameras for the Use in Robotics .....	92
<i>Michel Heinemann, Jonas Herzfeld, Martin Sliwinski, Johannes Hinckeldeyn, Jochen Kreuzfeldt</i>	

Dilated Convolution and Residual Network Based Convolutional Neural Network for Recognition of Disastrous Events .....	99
<i>Dania Shafique, Muhammad Usman Akram, Taimur Hassan, Tahira Anwar, Anum Abdul Salam</i>	
Towards Multidimensional Textural Perception and Classification Through Whisker.....	107
<i>Prasanna Kumar Routray, Aditya Sanjiv Kanade, Kshitij Tiwari, Pauline Pounds, Manivannan Muniyandi</i>	
Vision Based Sidewalk Recognition for Walking Assistive Robot in Outdoor Environments .....	114
<i>Kodai Oyake, Goragod Pongthansorn, Aya Shirai, Shin-Ichiro Kaneko, Genci Capi</i>	
Catch-Me-If-You-Can Infrastructure-Less UWB-Based Leader-Follower System for Compact UAVs.....	119
<i>Luca Santoro, Matteo Nardello, Marco Calliari, William Cechin Guarienti, Giordano Luchi, Daniele Fontanelli, Davide Brunelli</i>	
Dynamic Modelling of Multi-Body Unmanned Airship with a Slung-Payload .....	126
<i>Osama Obeid, Eric Lanteigne</i>	
Data-Driven Hardware-In-The-Loop Plant Modeling for Self-Driving Vehicles .....	133
<i>Hannah Grady, Nicholas Nauman, Md Suruz Miah</i>	
Effects of Blood Flow on the Tip Contact Force of Cardiac Ablation Catheters .....	141
<i>Reza Khoshbakht, Mojtaba Kheiri, Javad Dargahi, Amir Hooshidar</i>	
Realization of Pattern Formation for Micro-Satellite Swarms Without a Centralized Coordination .....	148
<i>Khalfan Alremeithi, Jorge Miranda Dias, Giulia De Masi</i>	

**Author Index**