

2018 IEEE International Conference on Autonomous Robot Systems and Competitions (ICARSC 2018)

**Torres Vedras, Portugal
25-27 April 2018**



**IEEE Catalog Number: CFP1882X-POD
ISBN: 978-1-5386-5222-0**

**Copyright © 2018 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:	CFP1882X-POD
ISBN (Print-On-Demand):	978-1-5386-5222-0
ISBN (Online):	978-1-5386-5221-3

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

Table of Contents

Welcome Message	iv
ICARSC 2018 Committees	v
Conference Program	vii
Table of Contents	xi
<i>Mobilizing Human Talent by Competitions and Challenge Prizes - The MBZIRC Case</i>	
Jorge Dias	1
<i>Aerial Robotic Manipulation and its Application to Inspection and Maintenance</i>	
Anibal Ollero	2
<i>“iCub, Clean the Table!” A Robot Learning From Demonstration Approach Using Deep Neural Networks</i>	
Jaeseok Kim, Nino Cauli, Pedro Vicente, Bruno Damas, Filippo Cavallo and José Santos-Victor	3
<i>The Role of Early Anticipations for Human-Robot Ball Catching</i>	
Diogo Carneiro, Filipe Silva and Petia Georgieva	10
<i>Modular Software Architecture for Human-Robot Interaction applied to the InterBot Mobile Robot</i>	
Ricardo Cruz, Luís Garrote, Ana Lopes and Urbano Nunes	17
<i>Motion-Induced Acoustic Noise Awareness for Socially-Aware Robot Navigation</i>	
João Andrade, Pedro Santana and Alexandre Almeida	24
<i>An Optimal Closed-Loop Framework to Develop Stable Walking for Humanoid Robot</i>	
Mohammadreza Mohades Kasaei, Nuno Lau and Artur Pereira	30
<i>A Novel Wireless Instrumented Shoe for Ground Reaction Forces Analysis in Humanoids</i>	
Luís Almeida, Vítor Santos and Filipe Silva	36
<i>Bipedal Running Through Imposition of a Stabilizing Contact Force</i>	
André S. Carvalho and Jorge M. Martins	42
<i>Application for Automatic Programming of Palletizing Robots</i>	
Frederico Moura and Manuel Silva	48
<i>Position Control of Mobile Robots with Multi-contour Adaptation</i>	
Mikhail Medvedev, Viacheslav Pshikhov, Gennady Kupovykh and Vladimir Shibanov	54
<i>Longitudinal Model Predictive Control with Comfortable Speed Planner</i>	
Jose Matute, Mauricio Marcano, Asier Zubizarreta and Joshue Perez	60
<i>Adaptive/Multi-Model Height Control System of a Quadrotor Constant Unknown Load Transportation</i>	
Pedro Outeiro, Paulo Oliveira and Carlos Cardeira	65

<i>CNN for IMU Assisted Odometry Estimation using Velodyne LiDAR</i> Martin Veľas, Michal Španěl, Michal Hradiš and Adam Herout	71
<i>Evaluation of an Automotive Short Range Radar Sensor for Mapping in Orchards</i> Sedat Dogru and Lino Marques	78
<i>Supervised Classification for Hyperspectral Imaging in UAV Maritime Target Detection</i> Sara Freitas, Carlos Almeida, Hugo Silva, José Almeida and Eduardo Silva	84
<i>Evaluating Pruned Object Detection Networks for Real-Time Robot Vision</i> Simon O’Keeffe and Rudi Villing	91
<i>CNN for Very Fast Ground Segmentation in Velodyne LiDAR Data</i> Martin Veľas, Michal Španěl, Michal Hradiš and Adam Herout	97
<i>Bio-Inspired Jumping Maneuver for Launching Flapping Wing Micro Air Vehicles</i> Hudson Omuži, Mohamed Fanni, Sabah Ahmed and Ahmed Sameh	104
<i>An Energy Balance Based Method for Parameter Identification of a Free-Flying Robot Grasping An Unknown Object</i> Monica Ekal and Rodrigo Ventura	110
<i>Feasibility Study of a Constrained Dijkstra Approach for Optimal Path Planning of an Unmanned Surface Vehicle in a Dynamic Maritime Environment</i> Yogang Singh, Sanjay Sharma, Robert Sutton, Daniel Hatton and Asiya Khan	117
<i>A Teleoperated Snake-Like Robot for Radiosurgery of Gastrointestinal Tumor Cells with Minimal Invasion</i> Olatunji Omisore, Shipeng Han, Lingxue Ren and Lei Wang	123
<i>Presenting BLUE: A roBot for Localization in Unstructured Environments</i> Iván Del Pino, Saúl Cova, Miguel Ángel Contreras, Francisco Candelas and Fernando Torres	130
<i>A Sparse-Dense Approach for Efficient Grid Mapping</i> Eurico Pedrosa, Artur Pereira and Nuno Lau	136
<i>Evaluating and Enhancing Google Tango Localization in Indoor Environments Using Fiducial Markers</i> Bernardo Marques, Raphaël Carvalho, Paulo Dias, Miguel Oliveira, Carlos Ferreira and Beatriz Sousa Santos	142
<i>Mitigating Effects of NLOS Propagation in MDS-based Localization With Anchors</i> Moses Koledoye, Tullio Facchinetti and Luis Almeida	148
<i>Redundant Robot Localization System Based in Wireless Sensor Network</i> Ricardo Reis, Jorge Mendes, Filipe Neves Dos Santos, Raul Morais, Nuno Ferraz, Luís Santos and Armando Sousa	154
<i>Fault Diagnosis System Via Internet Applied to a Gantry Robot - A Proposal for Industry 4.0</i> Mário J. G. C. Mendes, Íris M. M. S. Neto and J. M. F. Calado	160
<i>Tecnical Database on Robotics-based Educational Platforms for K-12 Students</i> Hugo Costelha and Carlos Neves	167
<i>Competitions and Industrial Tasks as a Way to Learn Basic Concepts in Robotics</i> Stefano Michieletto and Enrico Pagello	173
<i>Scoring Robotic Competitions: Balancing Judging Promptness and Meaningful Performance Evaluation</i> Fausto Ferreira, Gabriele Ferri, Yvan Petillot, Xingkun Liu, Marta Palau Franco, Matteo Matteucci, Francisco Javier Pérez Grau and Alan Ft Winfield	179
<i>RoboCup@Home: Summarizing Achievements in Over Eleven Years of Competition</i> Mauricio Matamoros, Viktor Seib, Raphael Memmesheimer and Dietrich Paulus	186
<i>Finding a Short Path for Mobile Robot Arm Coverage of a Point Set</i> Francisco Campos, Fernando Carreira and J. M. F. Calado	192

<i>Goal-biased Probabilistic Foam Method for Robot Path Planning</i> Silva, Daniel Fernandes, Válber Roza and Armando Sanca	199
<i>Planning Object Informed Search for Robots in Large Household Environments</i> Marco Antonio Gutiérrez Giraldo, Luis Jesus Manso Fernandez-Arguelles, Pedro Nuñez and Pablo Bustos García de Castro	205
<i>Automatic Generation of Disassembly Sequences and Exploded Views from SolidWorks Symbolic Geometric Relations</i> Carlos M. Costa, Germano Veiga, Armando Sousa, Luís Rocha, Eugénio Oliveira, Henrique Lopes Cardoso and Ulrike Thomas	211
<i>Heterogeneous Multi-Agent Planning Using Actuation Maps</i> Tiago Pereira, Nerea Luis, António Moreira, Daniel Borrajo, Manuela Veloso and Susana Fernandez	219
<i>On the Robot Path Planning Using Cloud Computing for Large Grid Maps</i> Imen Chaari, Anis Koubaa, Basit Qureshi, Habib Youssef, Ricardo Severino and Eduardo Tovar	225
<i>Mobile Manipulation for Autonomous Packaging in Realistic Environments: EuRoC Challenge 2, Stage II, Showcase</i> Gi Hyun Lim, Eurico Pedrosa, Filipe Amaral, Nuno Lau, Artur Pereira, Jose Luis Azevedo, Bernardo Cunha and Simone Badini	231
<i>A Generic Visual Perception Domain Randomisation Framework For Gazebo</i> João Borrego, Rui Figueiredo, Atabak Dehban, Plinio Moreno, Alexandre Bernardino and José Santos-Victor	237
<i>An Automated Pick-and-Place Benchmarking System in Robotics</i> Nils Neumann, Sebastian Meyer Zu Borgsen, Phillip Lücking and Sven Wachsmuth	243
<i>Path Planning aware of Soil Compaction for Steep Slope Vineyards</i> Luís Santos, Nuno Ferraz, Filipe Neves Dos Santos, Jorge Mendes, Raul Morais, Pedro Costa and Ricardo Reis	250
<i>“Less is More”: Simplifying Point Clouds to Improve Grasping Performance</i> Vasco Lopes, Luís A. Alexandre and Miguel Fernandes	256
<i>Generating Symbolic Representation from Sensor Data: Inferring Knowledge in Robotics Competitions</i> Francisco J Rodríguez Lera, Francisco Martín Rico and Vicente Matellán Olivera	261
<i>Author Index</i>	267