

2nd IFAC Conference on Embedded Systems, Computer Intelligence and Telematics (CESCIT 2015)

IFAC PapersOnline Volume 48, Issue 10

Maribor, Slovenia
22-24 June 2015

Editor:

Matjaz Colnaric

ISBN: 978-1-5108-1819-4

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2015) by Elsevier Limited
All rights reserved.

Printed by Curran Associates, Inc. (2016)

For permission requests, please contact the publisher, Elsevier Limited
at the address below.

Elsevier Limited
360 Park Ave South
New York, NY 10010

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

A Multi-Agent Based Approach to Support Adaptability in Home Care Applications	1
<i>A. Armentia, U. Gangoiti, R. Priego, E. Estévez, M. Marcos</i>	
Telemedical Applications with Rulebased Descision- and Information-Systems (TARDIS).....	7
<i>Michael Albert, Matthias Gors, Klaus Schilling</i>	
Miniaturized Multispectral VNIR/SWIR Imager for Small Satellites - System Design	12
<i>Tomaz Rotovnik, Dejan Gacnik, Iztok Kramberger</i>	
Embedded Image Processing Systems for Automatic Recognition of Cracks using UAVs	16
<i>Fábio Celestino Pereira, Carlos Eduardo Pereira</i>	
FPGA-based Control of a DC-DC Boost Converter	22
<i>Uros Sadek, Andrej Sarjaš, Rajko Svecko, Amor Chowdhury</i>	
FPGA-Based CCSDS Compliant Miniaturized Satellite Communication Stack	28
<i>David Selcan, Gregor Kirbiš, Iztok Kramberger</i>	
A Evaluation Test Bed for Outdoor Localization Algorithms Using a High-Precision Positioning System.....	34
<i>Daniel Eck, Robin Hess, Dorit Borrman, Klaus Schilling</i>	
Exploration Robots for Harsh Environments and Safety.....	41
<i>J. Liu, B.-Y. Ma, N. Fry, A. Pickering, S. Whitehead, N. Somjit, R. C. Richardson, I. D. Robertson</i>	
Path Planning and Motion Coordination for Multi-Robots System Using Probabilistic Neuro-Fuzzy	46
<i>Rami Al-Jarrah, Aamir Shahzad, Hubert Roth</i>	
RRTCPA* - RRT* Controller and Planner - Simultaneous Motion and Planning.....	52
<i>Robin Heb, Tobias Lindeholz, Daniel Eck, Klaus Schilling</i>	
The line Coating Robot - An Automated Mobile System for High Precision Powder Coating	58
<i>Michael Albert, Daniel Eck, Klaus Schilling</i>	
A Modified Simulated Annealing Algorithm for SUAVs Path Planning	63
<i>Lucas P. Behnck, Dionisio Doering, Carlos Eduardo Pereira, Achim Rettberg</i>	
Applying the Domain-Mapping-Matrix to Identify the Appropriate Level of Detail of Simulation Models for Virtual Commissioning	69
<i>Philipp Puntel Schmidt, Alexander Fay</i>	
Modelling and Simulation for the Integrated Design of Mechatronic Systems	75
<i>Giacomo Barbieri, Gabriele Goldoni, Roberto Borsari, Cesare Fantuzzi</i>	
Middleware-based Support for Reconfigurable Mechatronic Systems.....	81
<i>R. Priego, A. Agirre, E. Estévez, D. Orive, M. Marcos</i>	
An Analysis of Challenges and State of the Art for Modular Engineering in the Machine and Plant Manufacturing Domain	87
<i>Stefan Feldmann, Christoph Legat, Birgit Vogel-Heuser</i>	
Design-Space Exploration Tool for the HIPAO Methodology	93
<i>Rafael Lerm, Dionisio Doering, Carlos Eduardo Pereira</i>	
Integrated Motion Planning and Control for Multi Objectives Optimization and Multi Robots Navigation	99
<i>Bashra Kadhim Olewi, Rami Al-Jarrah, Hubert Roth, Bahaa I. Kazem</i>	
Evaluation of Methods for Robotic Mapping of Cultural Heritage Sites.....	105
<i>Dorit Borrman, Robin Hess, Daniel Eck, Hamidreza Houshbar, Andreas Nüchter, Klaus Schilling</i>	
Adaptive Teleoperation Using Intelligent Dynamic Voting.....	111
<i>Lakshminarasimhan Srinivasan, Julian Scharnagl, Christian Herrmann, Klaus Schilling</i>	
High Power Leds in Localization of Underwater Robotics Swarms.....	117
<i>R. Deir'Erba, C. Moriconi</i>	
A Randomized Approximation Convex Hull Algorithm for High Dimensions	123
<i>Antonio Ruano, Hamid Reza Khosravani, Pedro M. Ferreira</i>	
Comparison of Approaches for Identification of All-data Cloud-based Evolving Systems.....	129
<i>Sašo Blažič, Plamen Angelov, Igor Škrjanc</i>	
From Building Blocks to the Embedded Condition Monitoring System.....	135
<i>Pavel Ettler, Kamil Dedecius, Lenka Pavelková, Dani Juricic, Pavle Boškoski, Igor Steiner</i>	
Robust Optimal Regional Closed-loop Pole Assignment over Positivity Conditions and Differential Evolution	141
<i>Andrej Sarjaš, Amor Chowdhury, Rajko Svecko</i>	
Networked Control Systems with Application in the Industrial Tele-Robotics.....	147
<i>A. Kheirkhah, D. Aschenbrenner, M. Fritscher, F. Sittner, K. Schilling</i>	

Augmented Reality for Telemaintenance and -inspection in Force-Sensitive Industrial Robot Applications.....	153
<i>Florian Leutert, Klaus Schilling</i>	
Teleoperation of an Industrial Robot in an Active Production Line	159
<i>Doris Aschenbrenner, Michael Fritscher, Felix Sittner, Markus Kraub, Klaus Schilling</i>	
High Performance Force Control - A New Approach and Suggested Benchmark Tests.....	165
<i>Hartmut Bruhm, Alexander Czink, Markus Lotz</i>	
Performance Evaluation of Mobil Network Technologies for Industrial Machine to Machine Application	171
<i>M. Kraetzig, L. Rauchhaupt, B. Czybik</i>	
A PackML-based Design Pattern for Modular PLC Code.....	178
<i>Giacomo Barbieri, Nicola Battilani, Cesare Fantuzzi</i>	
A Low-cost PackML-based Control Solution for a Modular Production Line	184
<i>Gašper Mušič</i>	
Structured Product Development Process Implementation for a Packaging Company	190
<i>Andrea Margini, Gaetano Cutrona, Cesare Fantuzzi</i>	
Design of EMB-based Mealy FSMs with Transformation of Output Functions	197
<i>Alexander Barkalov, Larisa Titarenko, Kamil Mielcarek, Marek Wegrzyn</i>	
Hardware Reduction for EMB-based Mealy FSM	202
<i>Małgorzata Kolopienczyk, Alexander Barkalov, Larysa Titarenko, Marek Wegrzyn</i>	
Indoor Positioning based on Bayes Filtering Using Map Information.....	208
<i>Petra Hafner, Thomas Moder, Karin Wisiol, Manfred Wieser</i>	
MineLoc — Personnel Tracking System for Longwall Coal Mining Sites.....	215
<i>Andreas Fink, Helmut Beikirch</i>	
Future Challenges of Positioning in Underground Mines	222
<i>Linus Thrybom, Jonas Neander, Ewa Hansen, Krister Landernas</i>	
Monocular Visual Odometry on a Smartphone	227
<i>Simon Tomažic, Igor Škrjanc</i>	
Smart Phone Based Indoor Navigation for Guidance in Public Transport Facilities	233
<i>Olaf Czogalla</i>	
Safety Concept for a Mixed Criticality On-Board Software System	240
<i>Alejandro Alonso, Juan A. De La Puente, Juan Zamorano, Miguel A. De Miguel, Emilio Salazar, Jorge Garrido</i>	
Robust Distributed Control for a Mechanical-electrical Demonstrator Considering Communication Constraints.....	246
<i>A. Kheirkhah, F. Kempf, T. Tzschichholz, K. Schilling</i>	
Software Reliability Validation and Verification Using Fault Injection Techniques on a Fault Tolerant Processor	252
<i>Gregor Kirbiš, David Selcan, Iztok Kramberger</i>	
PEARL-Coded Function Block Diagrams — From Language Design to Verification	258
<i>Christina Houben</i>	
Schedulability Analysis of Hierarchical Systems with Arbitrary Scheduling in the Global Level.....	264
<i>Guasque Ana, Balbastre Patrieia, Brocal Vicent, Crespo Alfons</i>	
Simulation and Evaluation of Multiple Sporadic Servers Rescheduling.....	270
<i>Goran Martinovic, Miran Karic, Ivica Crnkovic</i>	
Improving Observer Design for Discrete-time TS Descriptor Models Under the Quadratic Framework.....	276
<i>Victor Estrada-Manzo, Zsófia Lendek, Thierry Marie Guerra</i>	
Nested Control Laws for $H\infty$ Disturbance Rejection Based on Continuous-Time Takagi-Sugeno Models.....	282
<i>Raymundo Márquez, Thierry Marie Guerra, Miguel Bernal, Alexandre Kruszewski</i>	
Adaptive Dynamic Surface Output-Feedback Control for a Class of Hysteric Nonlinear Systems with Prespecified Tracking Performance.....	288
<i>Xiuyu Zhang, Chunyi Su, Peng Yan</i>	
Adaptive Charged System Search Approach to Path Planning for Multiple Mobile Robots.....	294
<i>Radu-Emil Precup, Emil M. Petriu, Mircea-Bogdan Rada, Emil-Ioan Voisan, Florin Dragan</i>	
Author Index	