Interres EUROPEAN UNION

Grande Région | Großregion | Robotix-Academy

Fonds européen de développement régional | Europäischer Fonds für regionale Entwicklung



Robotix-Academy Conference for Industrial Robotics (RACIR) 2020

Partenaires du projet | Projektpartner:













Rainer Müller, Peter Plapper, Olivier Brüls, Wolfgang Gerke, Gabriel Abba, Bassem Hichri, Ali Kanso (Hrsg.)



Berichte aus der Robotik

Rainer Müller, Peter Plapper, Olivier Brüls, Wolfgang Gerke, Gabriel Abba, Bassem Hichri, Ali Kanso (Hrsg.)

Robotix-Academy Conference for Industrial Robotics (RACIR) 2020

Shaker Verlag Düren 2020 **Bibliographic information published by the Deutsche Nationalbibliothek** The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at http://dnb.d-nb.de.

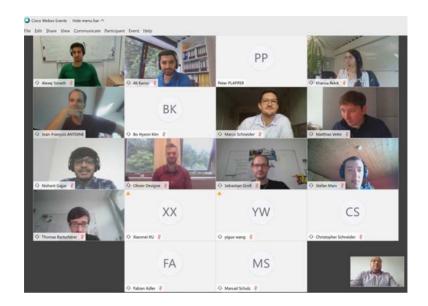
Copyright Shaker Verlag 2020 All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the publishers.

Printed in Germany.

ISBN 978-3-8440-7606-6 ISSN 1434-8098

Shaker Verlag GmbH • Am Langen Graben 15a • 52353 Düren Phone: 0049/2421/99011-0 • Telefax: 0049/2421/99011-9

Internet: www.shaker.de • e-mail: info@shaker.de



Robotics (RACIR) 2020

Preface:

Robotix-Academy Conference for Industrial Robotics (RACIR) is held at ZeMA, Germany, during July 16, 2020 as a web conference due to the effects of the Covid-19 crisis.

The venue for RACIR 2020 is the ZeMA - Center for Mechatronics and Automation. Founded in 2009, ZeMA sees itself as a development partner with the goal of industrialization and technology transfer of research and development results.

Working closely with institutes and chairs at Saarland University (UdS) and the University of Applied Sciences (htw saar), ZeMA passes on its research results to companies through an actively pursued technology transfer. In addition, ZeMA plays an active role in academic training.

The topics concerned by RACIR are: robot design, robot kinematics/dynamics/control, system integration, sensor/actuator networks, distributed and cloud robotics, bioinspired systems, service robots, robotics in automation, biomedical applications, autonomous vehicles (land, sea, and air), robot perception, manipulation with multifinger hands, micro/nano systems, sensor information, robot vision, multimodal interfaceand human-robot interaction.

Acknowledgements:

The Robotix-Academy partners and the participating students are acknowledged for their contributions and participation to the conference.

The organisation committee and involved persons are also acknowledged for their help and support.

Content

1	Soft finger modeling using a nonsmooth contact approach Olivier Devigne, Alejandro Cosimo and Olivier Brüls	1
2	Modified Feedback Linearization for Underactuated Cable Robot Control: Case studies Atal Anil Kumar, Jean-François Antoine, Vianney Papot, Patrick Zattarin and Prof. Dr. Gabriel Abba	7
3	A synchronized-HRC pick and place application using an intelligent vision system Prof. DrIng. Rainer Müller, Nishant Ketan Gajjar, Ahmad El Masri and Khansa Rekik	14
4	Hybrid Workstations: A Simultaneous Planning Method for Economic-oriented Selection between Industrial and Collaborative Robots Christopher Schneider, Thomas Suchanek, Martina Hutter-Mironovova, Francisco Hernandez, Mohamad Bdiwi and Matthias Putz	19
5	Practically Oriented Investigation of Sensitive Robots Regarding the Execution of Force Controlled Applications Prof. DrIng. Rainer Müller, Ali Kanso and Marco Schneider	27
6	External communication of the robot ABB YuMi via virtual machine with analysis of hybrid position-force control Wang Yiguo, Meryem Taghbalout, Jean-François Antoine and Gabriel Abba	35
7	Mobile Robot Lifting Mechanism Design for Manipulation and transportation task Bassem Hichri and Peter Plapper	41
8	Mobile Robots Target Reaching and Virtual Structure Navigation Based on Limit-Cycle Method Bassem Hichri and Peter Plapper	49
9	Unconventional path planning for a serial kinematics robot with Reinforcement Learning using the example of the wire loop game <i>Prof. DrIng. Rainer Müller, Ali Kanso and Stefan Marx</i>	55