

Berichte aus der Robotik

**Rainer Müller, Peter Plapper,  
Olivier Brüls, Wolfgang Gerke,  
Gabriel Abba, Matthias Vette-Steinkamp (Hrsg.)**

**Robotix-Academy Conference for Industrial Robotics  
(RACIR) 2017**

Shaker Verlag  
Aachen 2017

**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 2017

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 978-3-8440-5502-3

ISSN 1434-8098

Shaker Verlag GmbH • P.O. BOX 101818 • D-52018 Aachen

Phone: 0049/2407/9596-0 • Telefax: 0049/2407/9596-9

Internet: [www.shaker.de](http://www.shaker.de) • e-mail: [info@shaker.de](mailto:info@shaker.de)



## Robotix-Academy Conference for Industrial Robotics (RACIR)

### Preface:

Robotix-Academy Conference for Industrial Robotics (RACIR) is held in Luxembourg University during June 06-07, 2017. The venue for RACIR 2016 is the Campus Kirchberg in Luxembourg. The University of Luxembourg aspires to be one of Europe's most highly regarded universities with a distinctly international, multilingual and interdisciplinary character. It fosters the cross-fertilisation of research and teaching, is relevant to its country, known worldwide for its research and teaching in targeted areas, and becomes an innovative model for contemporary European Higher Education. Today, after over ten years of intense developments, the University has an internationally relevant research University with students originating from 115 countries, academic staff from 20 countries as well as 78 partner universities around the globe.

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 interface and 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

<b>1</b>	<b>Towards Intelligent Robot Assistants for the nondestructive Disassembly of End of Life Products</b>	<b>1</b>
	<i>Jan Jungbluth, Wolfgang Gerke and Peter Plapper</i>	
<b>2</b>	<b>Human-Robot-Collaboration for dismantling processes</b>	<b>9</b>
	<i>Sebastian Groß, Wolfgang Gerke and Peter Plapper</i>	
<b>3</b>	<b>Robot control based on human motion analysis with IMU measurements</b>	<b>13</b>
	<i>Robin Pellois, Laura Joris and Olivier Brüls</i>	
<b>4</b>	<b>PID and Biomimetic Variable Structure Path Tracking Control in Automated Surface Finishing Processes</b>	<b>18</b>
	<i>Sophie Klecker, Peter Plapper and Bassem Hichri</i>	
<b>5</b>	<b>Feedforward control of vibrations in flexible and lightweight robots</b>	<b>25</b>
	<i>Arthur Lismonde, Valentin Sonnevill and Olivier Brüls</i>	
<b>6</b>	<b>Robotic peg-in-hole process for assembly of light weight structures</b>	<b>30</b>
	<i>Abir Gallala, Bassem Hichri, Meysam Minoufekar and Peter Plapper</i>	
<b>7</b>	<b>A concept for construction of an adaptive reconfigurable robot manipulator to fit modern application scenarios</b>	<b>34</b>
	<i>Rainer Müller, Matthias Vette and Ali Kanso</i>	
<b>8</b>	<b>The optimization of the deflection error of an industrial robot for a friction stir welding application</b>	<b>43</b>
	<i>Fawzia.Dardouri, Gabriel Abba and W.Seemann</i>	
<b>9</b>	<b>Measurement strategy for flexible assembly for adhesive bonding</b>	<b>51</b>
	<i>Rainer Müller, Matthias Vette-Steinkamp, Ortwin Mailahn, Sasha Andres and Patrick Becker</i>	