ISR
International Symposium on Robotics
50th Anniversary

June 20–21, 2018
Messe München, Entrance East,
Munich, Germany

Robotics in the era of digitalisation:

isr2018.org

Program in conjunction with

automatica
The Leading Exhibition for Smart Automation and Robotics
June 19–22, 2018 | Munich
automatica-munich.com
Welcome address by the Chair of ISR 2018

Robotics in the era of Digitalization! After two years the 50th International Symposium on Robotics, ISR 2018, will again be held in Munich, Germany, from June 20–21, 2018. This international conference is jointly organized by the Mechanical Engineering Industry Association (VDMA) and the Information Technology Society (ITG) within VDE. In 2018, ISR celebrates its 50th anniversary. The first ISR in 1970 was the first global robot conference ever and it continues to be the world’s leading robot conference!

The ISR 2018 conference will again take place at automatica, the leading exhibition for smart automation and robotics. With roughly 900 exhibitors and more than 45,000 visitors from all over the world, automatica 2018 established itself as the leading marketplace for automated production. As the fair will start one day before ISR 2018, there will be enough possibility and time for all conference participants to visit automatica.

In about 100 presentations, ISR 2018 will give an insight into the latest state-of-the-art robot technologies to participants from both industry and science. Sessions will be held on Modeling, Planning and Control as well as Components and Technologies.
Robotics in Production/Industrial Robots will also be addressed as well as Service Robotics. Additionally there will be sessions on Robotics in New Markets and Applications and on the Workplace of the Future as well as a special IERA session.

Presentations of the final nominees of the Joseph F. Engelberger Award and the IERA award highlight the conference’s gala banquet. Of course there will be a conference poster session that can be visited between and during the conference sessions. Numerous submissions have been submitted. We are excited to present you an interesting conference program.

Univ.-Prof. Dr.-Ing. Dr. h.c. mult. Alexander Verl, Chair of ISR 2018 on behalf of the International Federation of Robotics (IFR)
Location
Press Center East

Press Center East, 1st Floor

Press Center East, 2nd Floor

Press Center East, Ground Floor

Distribution trades
- ■ Agriculture
- ■ Logistics
- ■ Health-care
- ■ Cleaning
- ■ Security
- ■ and much more

Connections: Global Competence
The Leading Exhibition for Smart Automation and Robotics
June 19–22, 2018 | Munich
automatica-munich.com
Systems, key technologies and components for service robotics

- Distribution trades
- Agriculture
- Logistics
- Health-care
- Cleaning
- Security
- and much more

automatica
The Leading Exhibition for Smart Automation and Robotics
June 19–22, 2018 | Munich
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Keynotes

Wednesday, June 20, 2018

Sebastian Trimpe: “Machine Learning for Dynamic Systems”
Dr. Sebastian Trimpe, Max Planck Institute for Intelligent Systems, Stuttgart, Germany
10:50 – 11:30

Torsten Kröger: “Transfer Learning”
Torsten Kröger, Karlsruhe Institute of Technology (KIT), Germany
11:30 – 12:10

Sami Haddadin: “Human Centered Robotics”
Prof. Sami Haddadin, Technical University Munich (TUM), Germany
13:30 – 14:10
Jianwei Zhang: “Synergic research on future robotics technologies from the Sino-German perspective”
Prof. Jianwei Zhang, University of Hamburg, Germany
09:00 – 09:40

Michael Zürn: “Robot Farming—The Future of Industrial Robotics at Daimler”
Dr. Michael Zürn, Daimler AG, Germany
12:00 – 12:40

Oussama Khatib: “The Age of Human-Robot Collaboration”
Prof. Oussama Khatib, Stanford University, USA
13:40 – 14:20
## Program

### Wednesday, June 20, 2018

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<td>09:15</td>
<td>Welcome</td>
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<td>09:30</td>
<td>IERA Session</td>
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</table>
| 10:50 | **Keynote 1:** “Machine Learning for Dynamic Systems”  
Dr. Sebastian Trimpe, Max Planck Institute for Intelligent Systems, Stuttgart, Germany | | | |
| 11:30 | **Keynote 2:** “Transfer Learning”  
Torsten Kröger, Karlsruhe Institute of Technology (KIT), Germany | | | |
| 12:10 | Lunch and Poster Session | | | |
| 13:30 | **Keynote 3:** “Human Centered Robotics”  
Prof. Sami Haddadin, Technical University Munich (TUM), Germany | | | |
| 14:10 | Session 2.1: Components | Session 3.1: Industrial Robots | Session 4.1: Service Robots | |
| 15:30 | Poster Session and Coffee Break | | | |
| 16:00 | Session 2.2: Technologies | Session 3.2: Automation | Session 4.2: Service Robots | |
| 17:20 | Panel Discussion: On the Future of Robotics | | | |
| 18:30 | Departure for Conference Dinner and Award Ceremonies | | | |

### Conference Dinner

19:45–22:30  
**Conference Dinner at Hofbräuhaus München**  
IERA and Engelberger Award Ceremony
**Thursday, June 21, 2018**

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<thead>
<tr>
<th>Time</th>
<th>Session 1.1: Modeling</th>
<th>Session 6.1: Future of Work</th>
<th>Session 4.3: Service Robot Software Architecture</th>
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**Program.**
Program Committee
ISR 2018

Chair
Alexander Verl, University of Stuttgart, Germany

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Joe Gemma, IFR, USA
Jeff Burnstein, RIA, USA
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Myron Diftler, NASA/Johnson Space Center, USA
Hao Ding, ABB AG, Germany
Manfred Dresselhaus, KUKA Industries, Germany
Olav Egeland, NTNU, Norway
Norbert Elkmann, Fraunhofer IFF, Germany
Jörg Franke, University Erlangen, Germany
Horst-Michael Groß, Ilmenau University of Technology, Germany
Martin Hägele, Fraunhofer IPA, Germany
Bernd Kuhlenkötter, Ruhr-Universität Bochum, Germany
Ren C. Luo, National Taiwan University, Taiwan
Alexander Meißen, Dürr Systems, Germany
Mircea Nitulescu, Robotics Society of Romania, Romania
Paul Ploeger, Bonn-Rhein-Sieg University of Applied Science, Germany
Andreas Pott, Fraunhofer IPA, Germany
Erwin Prassler, Bonn-Rhein-Sieg University of Applied Science, Germany
Annika Raatz, Leibniz University Hannover, Germany
Jürgen Roßmann, RWTH Aachen, Germany
Redland Sanders, mtc Manufacturing Technology Centre, UK
Dominique Schär, Güdel, Switzerland
Bruno Siciliano, Universita di Napoli, Italy
Thorsten Schüppstuhl, Technical University Hamburg-Harburg, Germany
Ulrike Thomas, Technical University Chemnitz, Germany
Bernardo Wagner, University Hannover, Germany
Georg von Wichert, Siemens AG, Germany

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Volker Schanz, VDE, Germany

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Jasmin Kayadelen, VDE Conference Services, Germany
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Patrick Schwarzkopf, VDMA Robotics + Automation, Germany
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Organized by
ITG (VDE) Information Technology Society of VDE
VDMA Robotics + Automation
IFR International Federation of Robotics
**Conference ISR 2018 Program**

**Wednesday, June 20, 2018**

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**Session 2.1: Components**

Chair: Ulrike Thomas (Chemnitz University of Technology, Germany)

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>14:10</td>
<td>“A Compliant, High Precision, Pneumatic Rotary Drive for Robotics”</td>
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<td>Johannes T Stoll (Fraunhofer IPA, Germany); Andreas Pott</td>
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<td></td>
<td>(University of Stuttgart, Germany)</td>
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<tr>
<td>14:30</td>
<td>“Comparison of 3D Shape Reconstruction Methods with Fiber-Optic Sensors”</td>
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<td>Christopher Riehs (Graduate School Of Excellence Advanced Manufacturing Engineering, University Stuttgart &amp; Fraunhofer Institute for Manufacturing Engineering and Automation IPA, Germany); Bernhard Kleiner and Urs Schneider (Fraunhofer IPA, Germany); Alexander Verl (Stuttgart University, Institute for Control Engineering of Machine Tools, Germany)</td>
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<td>14:50</td>
<td>“Development of Light and Compact Clutch Device using Jamming Effect”</td>
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<td>Yasumichi Aiyama and Tianren Liu (University of Tsukuba, Japan)</td>
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<tr>
<td>15:10</td>
<td>“Tactile Sensor Modules for Flexible Manipulation”</td>
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<td>Veit Müller (Fraunhofer Institute for Factory Operation and Automation IFF, Germany); Christoph Urbahn, Reem AlGaifi, Maximilian Schmidt, José Saenz and Norbert Elkmann (Fraunhofer IFF, Germany)</td>
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</table>
Session 3.1: Industrial Robots
Chair: Sebastian Reitelshöfer (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany)

14:10 “On the implementation of transferable assembly applications for industrial robots” Lorenz Halt, Philipp Tenbrock, Frank Nägele and Andreas Pott (Fraunhofer IPA, Germany)

14:30 “Robotic Friction Stir Welding of complex geometry and mixed materials” Gunnar Bolmsjö (Linnaeus University, Sweden); Ana Magalhães (University West, Sweden); Lars Cederqvist (SKB AB, Sweden); Jeroen De Backer (University West, Sweden)

14:50 “Online Motion Planning for Dual-Arm Industrial Robots” Felix Beuke (University of Stuttgart & Robert Bosch GmbH, Germany); Sergey Alatartsev, Simon Jessen and Christian Hanel (Robert Bosch GmbH, Germany); Alexander Verl (Stuttgart University, Institute for Control Engineering of Machine Tools, Germany)

15:10 “Workpiece localization methods for robotic welding—a review” Gesine Schleth (Fraunhofer Institute for Manufacturing Engineering and Automation IPA, Germany); Alexander Kuss and Werner Kraus (Fraunhofer IPA, Germany)

Session 4.1: Service Robots
Chair: Myron Diftler (NASA/Johnson Space Center, USA)

14:10 “Development and evaluation of a fingertip operated joystick” Nobuto Matsuhira (Shibaura Institute of Technology, Japan)

14:30 “Design of a novel spherical robot with high dynamic range and maneuverability for flexible applications” Vadym Bilous and Ulrich Berger (Brandenburg University of Technology, Germany); Mayur Andulkar (BTU Cottbus Senftenberg & Chair of Automation Technology, Germany)

14:50 “Experimental Platform of Space Robot Grasping Various Non-prehensile Targets” Xin Zhang (Shenyang Institute of Automation, Chinese Academy of Sciences & University of Chinese Academy of Sciences, P.R. China); Jinguo Liu (Shenyang Institute of Automation, Chinese Academy of Sciences, P.R. China)

15:10 “Datasets of Long Range Navigation Experiments in a Moon Analogue Environment on Mount Etna” Mallikarjuna Vayugundla (Robotics and Mechatronics Center (RMC), Institute of Robotics and Mechatronics & Deutsches Zentrum für Luft- und Raumfahrt e. V. (DLR), Germany); Florian Steidle, Michal Smisek, Martin J. Schuster, Kristin Bussmann and Armin Wedler (Robotics and Mechatronics Center (RMC), Institute of Robotics and Mechatronics, Germany)
### 15:30 Poster Session and Coffee Break

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<tr>
<th>Title</th>
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<tr>
<td>“Stabilization of a hopper with three reaction wheels”</td>
<td>Igor Ryadchikov (Kuban State University, Russia); Dmitry Sokolov (University of Lorraine, France); Andrei Biryuk (Kuban State University, Russia); Semyon Sechenev (Kuban State University &amp; Dynamic Stabilization Systems LTD, Russia); Alexander Svidlov, Pavel Volkodav, Yury Mamelin and Kirill Popko (Kuban State University, Russia); Evgeny Nikulchev (Moscow Technological Institute, Russia)</td>
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<tr>
<td>“Automated and Flexible Coil Winding Robotic Framework”</td>
<td>Stefano Michieletto, Francesca Stival and Francesco Castelli (University of Padova, Italy); Enrico Pagello (University Padova, Italy)</td>
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<tr>
<td>“Estimating powered wheelchair driver intentions more accurately using force feedback information”</td>
<td>Alexander Huentemann, Emmanuel Vander Poorten and Eric Demeester (University of Leuven, Belgium)</td>
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<td>“About robot applications and robotic research”</td>
<td>Christoph Hellmann, Thilo Zimmermann and Werner Kraus (Fraunhofer IPA, Germany)</td>
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<tr>
<td>“Correlation between the dynamic behavior of a six-axis industrial robot and the milling process”</td>
<td>Ali Karim (University of Stuttgart &amp; University of Stuttgart, Germany); Melanie Munz (University of Stuttgart, Germany); Alexander Verl (Stuttgart University, Institute for Control Engineering of Machine Tools, Germany)</td>
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<tr>
<td>“Design and Development of a Low-Cost Open-Source Robotics Education Platform”</td>
<td>Timothy Darrah (Vanderbilt University &amp; Electrical Engineering &amp; Computer Science, USA); Nicole Hutchins (Vanderbilt University, USA); Gautam Biswas (Vanderbilt University &amp; Institute for Software Integrated Systems, USA)</td>
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<tr>
<td>“Online Intention Prediction and Task Planning for Human-Robot Collaboration and Competition”</td>
<td>Huan Tan (GE Global Research, USA)</td>
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<td>“Theoretical Aspects of Impedance Controllers’ Modularization”</td>
<td>Ferenc Fodor (Technical University of Cluj-Napoca, Romania); Alexander Verl (Stuttgart University, Institute for Control Engineering of Machine Tools, Germany); Cornel Brisan (Technical University of Cluj-Napoca, Romania)</td>
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<td>“The Robotic ServiceAssistant—Relieving the Nursing Staff of Workload”</td>
<td>Simon Baumgarten, Birgit Graf and Theo Jacobs (Fraunhofer IPA, Germany)</td>
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<td>“Simulation of multi-axis machining using the BSP-dexel representation”</td>
<td>Evgenii Katz, Dmitry Kurennov and Alexander Petunin (Ural Federal University, Russia)</td>
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<tr>
<td>“Systematic Analysis of Global and Local Planners for Optimal Trajectory Planning”</td>
<td>Maximilian Pittner, Markus Hiller and Florian Particke (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany); Lucila Patino-Studencki (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany); Jörn Thielecke (Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany)</td>
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<tr>
<td>“Performance Impact Assessment for SSM using Simulated Stations”</td>
<td>Nicolas H. Lehment (ABB Gomtec GmbH, Germany); Remus Boca (ABB Corporate Research Center, USA)</td>
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<td>“HRIM: the Hardware Robot Information Model”</td>
<td>Irati Zamalloa, Victor Mayoral Vilches (Erle Robotics &amp; Acutronic Robotics, Spain)</td>
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"A Virtual Robot to support Programming Learning" Joao Tiago Aparicio (Instituto Universitario de Lisboa (ISCTE-IUL), ISTAR-IUL, Portugal); Carlos J Costa (University of Lisbon, Portugal); Manuela Aparicio (Instituto Universitario de Lisboa (ISCTE-IUL), ISTAR-IUL, Portugal)

"Positioning Error Analysis of Least Squares Method for Wireless Sensor Networks" XiangRui Tian (Nanjing University of Aeronautics and Astronautics, P.R. China); Weikun Zhen (Carnegie Mellon University, USA); Sebastian Scherer (The Robotics Institute, Carnegie Mellon University, USA); Xiong Lu (Nanjing University of Aeronautics and Astronautics, P.R. China)

"The Potential of RFID-Technology in Combination with Robotic Manipulators" Christian Thomann and Alexander Winkler (Hochschule Mittweida, University of Applied Sciences, Germany)

"Design Concept of an Automated Solid Waste Selection System" Catalin Boanta (Technical University of Cluj-Napoca, Romania); Mihai Margaritescu (The National Institute of R&D in Mechatronics and Measurement Technique, Romania); Alexander Verl (Stuttgart University, Institute for Control Engineering of Machine Tools, Germany); Cornel Brisan (Technical University of Cluj-Napoca, Romania)

"Potentials of vacuum suction grippers in human-robot-collaboration applications" David Straub (Graduate School Of Excellence Advanced Manufacturing Engineering, Germany); Kevin Huber (J. Schmalz GmbH, Germany)

"Evaluating Genetic Algorithm based parameter tuning of a black-box object localisation algorithm for random bin picking" Maarten Verheyen, Jeroen De Maeyer and Eric Demeester (University of Leuven, Belgium)

"ESMERA—European SMEs Robotics Applications" Esra Icer, Sebastian Weisenburger, Michael Zechmair and Arne Peters (Technische Universität München, Germany); Alois Knoll (Technical University Munich Garching, Germany); Sotiris Makris and George Michalos (University of Patras, Greece)

"Robotized transportation of existing carts" Niels Jacobsen (Mobile Industrial Robots ApS, Denmark)

Session 2.2: Technologies
Chair: Bernd Kühlenkötter (Ruhr-Universität Bochum, Lehrstuhl für Produktionssysteme (LPS), Germany)

16:00 "Augmented Reality Robot Operation Interface with Google Tango" Michael Gradmann, Eric Orendt, Edgar Schmidt and Stephan Schweizer (Universität Bayreuth, Germany); Dominik Henrich (University of Bayreuth, Germany)

16:20 "Efficient Object Pose Estimation in 3D Point Clouds using Sparse Hash-Maps and Point-Pair Features" Hannes Kisner and Ulrike Thomas (Chemnitz University of Technology, Germany)

16:40 "Determining robot contour accuracies on non-standard geometries using imaging techniques" Christoph Scharfenberg, Ute Gauger, Adrian Wolf, Jan Fischer and Martin Schray (TRUMPF Laser- und Systemtechnik GmbH, Germany)

17:00 "Validation of workspace monitoring and human detection for soft safety with collaborative mobile manipulator using machine learning techniques in the ColRobot project" Simone Bexten, Julian-Benedikt Scholle, José Saenz, Christoph Walter and Norbert Elkmann (Fraunhofer IFF, Germany)
Session 3.2: Automation

Room 1

16:00 “Towards plug and work—OPC UA as middleware of modern automation systems” Florian Krebs (German Aerospace Center, Germany)

16:20 “Using OPC UA for distributed industrial robot control” Axel Vick and Jörg Krüger (Fraunhofer IPK, Germany)

16:40 “Towards a Common Manufacturing Service Bus to Enable Flexible Plug-and-Produce Automation” Fábio Miranda and Renato Martins (Introsys, Portugal); Kirill Dorofeev (Fortiss GmbH, Germany); Valerio Gentile (We Plus S. p. A, Italy); Pedro Ferreira (Loughborough University, United Kingdom (Great Britain)); Magno Guedes (Introsys, Portugal)

17:00 “Production Logistics with mobile robots” Christian Wurll, Timo Fritz, David Hollnaicher and Yannick Hermann (Karlsruhe University of Applied Sciences, Germany)

Session 4.2: Service Robots

Room 2

Chair: Alexander Verl (Stuttgart University, Institute for Control Engineering of Machine Tools, Germany)

16:00 “How to Always Keep an Eye on the User with a Mobile Robot?” Alexander Vorndran, Thanh Q. Trinh, Steffen Mueller, Andrea Scheidig and Horst-Michael Gross (Ilmenau University of Technology, Germany)

16:20 “Visual Classification of Single Waste Items in Roadside Application Scenarios for Waste Separation” Jochen Lindermayr, Cathrin Senst, Manh-Ha Hoang and Martin Hägele (Fraunhofer IPA, Germany)

16:40 “Immersive Teleoperation of the Gaze of Social Robots. Assessing Gaze-Contingent Control of Vergence, Yaw and Pitch of Robotic Eyes” Rémi Cambuzat and Frédéric Elisei (GIPLSA-Lab, France); Gérard Bailly (Institut National Polytechnique de Grenoble, France); Olivier Simonin (INSA Lyon, France); Anne Spalanzani (Pierre-Mendès-France University, France)

17:00 “Take a seat, please”: Approaching and Recognition of Seated Persons by a Mobile Robot Thanh Q. Trinh, Tim Wengefeld, Steffen Mueller, Alexander Vorndran, Michael Volkhardt, Andrea Scheidig and Horst-Michael Gross (Ilmenau University of Technology, Germany)

17:20 PD: Panel Discussion: On the Future of Robotics

Plenary

Chair: Holger Paul (VDMA, Germany)
Panellists: Martin May (SCHUNK GmbH & Co. KG, Germany); Torsten Kröger (Karlsruhe Institute of Technology (KIT), Germany); Ron Diftler (NASA/Johnson Space Center Houston, USA); Bernd Liepert (KUKA AG, Germany); tba (ABB Robotics, Germany)

19:45 Conference Dinner at Hofbräuhaus München

IERA and Engelberger Award Ceremonies (Bus shuttle departs at 18:40 from the conference venue)
Thursday, June 21, 2018

09:00  Keynote 4: Prof. Jianwei Zhang
"Synergic research on future robotics technologies from the Sino-German perspective" (Plenary)

Session 1.1: Modeling
Chair: Karsten Berns (Technische Universität Kaiserslautern, Germany)

09:40  “Pose Estimation of Mobile Robots with Quantized Measurements using EFIR Filtering: Experimental comparison with the EKF” Daniel Heß and Christof Röhrig
(University of Applied Sciences and Arts, Dortmund, Germany)

10:00 “Functional Integration of a Robotics Software Framework into a Human Simulation System” Kai Lemmerz and Paul Glogowski (Ruhr-Universität Bochum, Germany); Alfred Hypki and Bernd Kuhlenkötter (Ruhr-Universität Bochum, Lehrstuhl für Produktionssysteme (LPS), Germany)

10:20 “A Cable-Driven Parallel Robot Remotely Controlled by a Human-Driven Parallel Cable Robot” Chang-Sei Kim (Chonnam National University & School of Mechanical Engineering, Korea); Jinwoo Jung, Eui-Sun Kim, Xuejin Kim, Jiniong Park, Eunpyo Choi and Jongoh Park (Chonnam National University, Korea)

Session 6.1: Future of Work
Chair: Gunther Reinhart (Fraunhofer IGCV, Germany)

09:40  “PowerGrasp: Concept for a novel Soft-Robotic Arm Support System” Jan Kuschan, Jean-Paul Goppold, Henning Schmidt and Jörg Krüger (Fraunhofer IPK, Germany)

10:00 “Design of a wearable robotic hand to investigate multisensory illusions and the bodily self of humans” The Vu Huynh, Andrej Scherf and Alina Bittner (Technische Universität Darmstadt, Germany); Gianluca Saetta (University Hospital Zurich, Switzerland); Bigna Lenggenhager (University of Zurich, Switzerland); Philipp Beckerle (Technische Universität Darmstadt, Germany)

10:20 “Integration of Safety elements into task-oriented programming system for human-robot-collaboration” Julia Berg, Christoph Richter and Gunther Reinhart (Fraunhofer IGCV, Germany)
### Session 4.3: Service Robot Software Architecture  
**Room 2**

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<tr>
<td>09:40</td>
<td>“Dynamic Route Planning for Area Processing Autonomous Robots”</td>
<td>Moritz Weisenböhler and Christian Wurll (Karlsruhe University of Applied Sciences, Germany)</td>
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<tr>
<td>10:00</td>
<td>“3D SLAM With Scan Matching and Factor Graph Optimization”</td>
<td>Thomas Emter and Janko Petereit (Fraunhofer IOSB, Germany)</td>
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<tr>
<td>10:20</td>
<td>“Semi-automatic Calibration of UWB Range Measurements for an Autonomous Mobile Robot”</td>
<td>Merlin Stampa and Marcel Müller (University of Applied Sciences and Arts Dortmund, Germany); Daniel Heß (University of Applied Sciences and Arts, Dortmund, Germany); Christof Röhrig (University of Applied Sciences and Arts in Dortmund, Germany)</td>
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10:40  **Poster Session and Coffee Break**  
(Poster agenda please find on page 14)

### Session 1.2: Planning  
**Plenary**

Chair: Arturo Baroncelli (IFR, Italy)

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<tr>
<td>11:00</td>
<td>“Behavior-based approach for calculation of a robot arm’s inverse kinematics on an FPGA”</td>
<td>Alexander Köpper (University of Kaiserslautern, Germany); Karsten Berns (Technische Universität Kaiserslautern, Germany)</td>
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<tr>
<td>11:20</td>
<td>“Mobile robot path planning with explicit consideration of uncertainty due to state space and action space discretisation”</td>
<td>Eric Demeester (University of Leuven, Belgium)</td>
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<tr>
<td>11:40</td>
<td>“Computation of Collision Distance and Gradient using an Automatic Sphere Approximation of the Robot Model with Bounded Error”</td>
<td>Andreas Völz and Knut Graichen (Ulm University, Germany)</td>
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### Session 3.3: Industrial Robot Applications  
**Room 1**

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tr>
<td>11:00</td>
<td>“Development of Robot Programming System through the use of Augmented Reality for Assembly Tasks”</td>
<td>Wenchao Zou (Brandenburg University of Technology Cottbus-Senftenberg, Germany); Mayur Andulkar (BTU Cottbus Senftenberg &amp; Chair of Automation Technology, Germany); Ulrich Berger (Brandenburg University of Technology, Germany)</td>
</tr>
<tr>
<td>11:20</td>
<td>“Sealing Process on a Large Floor Grid Crossbeam Assembly through Human-Robot-Cooperation”</td>
<td>Rainer Müller, Matthias Vette-Steinkamp and Aaron Geenen (ZeMA Zentrum für Mechatronik und Autom. gGmbH, Germany)</td>
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</table>
Session 4.4: Service Robot Technologies
Chair: Jongoh Park (Chonnam National University, Korea)

11:00 “System Identification and Sliding Mode Depth Control of the Micro AUV SEMBIO” Ulrich Behrje and Ammar Amory (University of Luebeck, Germany); Benjamin Meyer (University of Luebeck & Institute of Computer Science, Germany); Erik Maehle (University of Luebeck, Germany)

11:20 “Semantic Segmentation Guided SLAM Using Vision and LiDAR” Naman Patel (New York University, USA); Prashanth Krishnamurthy (NYU Polytechnic School of Engineering, USA); Farshad Khorrami (New York University, USA)

11:40 “Lack of Robustness of LiDAR-Based Deep Learning Systems to Small Adversarial Perturbations” Naman Patel and Kang Liu (New York University, USA); Prashanth Krishnamurthy (NYU Polytechnic School of Engineering, USA); Farshad Khorrami, Siddharth Garg (New York University, USA)

12:00 Keynote 5: Dr. Michael Zürn „Robot Farming—The Future of Industrial Robotics at Daimler“ (Plenary)

12:40 Lunch and Poster Session

13:40 Keynote 6: Prof. Oussama Khatib “The Age of Human-Robot Collaboration” (Plenary)

Session 1.3: Control
Chair: Martin Hägele (Fraunhofer IPA, Germany)

14:20 “Orientation dependent stiffness optimization of wearable robotics components” Benedikt Kriegesmann (Technische Universität Hamburg, Germany); Robert Weidner (Helmut Schmidt University, Germany); Erik Fleming (Technische Universität Hamburg, Germany)

14:40 “Calibration of multiple 3D LiDAR sensors to a common vehicle frame” Nina Heide (Fraunhofer Institute of Optronics, System Technologies and Image Exploitation, Germany); Thomas Emter and Janko Petereit (Fraunhofer IOSB, Germany)

15:00 “Behavior-Based Low-Level Control for (semi-) Autonomous Vehicles in Rough Terrain” Thorsten Ropertz and Patrick Wolf (TU Kaiserslautern, Germany); Karsten Berns (University of Kaiserslautern, Germany)

Session 3.4: Robotics in Production
Chair: Christian Schlosser (Lufthansa Technik AG, Germany)

14:20 “Guiding Robots to Predefined Goal Positions with Multi-Modal Feedback” Michael Riedl and Dominik Henrich (University of Bayreuth, Germany)

14:40 “Intuitive visual definition of part aligned coordinate systems and motions for industrial robots” Bernd Winkler (Fraunhofer IPA, Germany)
15:00 “Simulation-based Control of Reconfigurable Robotic Workcells: Interactive Planning and Execution of Processes in Cyber-Physical Systems” Marc Priggemeyer (RWTH Aachen University, Germany); Juergen Rossmann (Technical University of Aachen, Germany)

Session 6.2: HRC Applications
Chair: Annika M. Raatz (Leibniz Universität Hannover & Institute of Assembly Technology, Germany)

14:20 “Improvements in Robot Teaching for Handling Operations in Production Environments” Jan Hodapp (Daimler AG & Brandenburg University of Technology Cottbus-Senftenberg, Germany); Mayur Andulkar (BTU Cottbus Senftenberg & Chair of Automation Technology, Germany); Thorsten Reichling (Daimler AG, Germany); Ulrich Berger (Brandenburg University of Technology, Germany)

14:40 “Fast Graphical Task Modelling for Flexible Human-Robot Teaming” Dominik Riedelbauch (Universität Bayreuth, Germany); Dominik Henrich (University of Bayreuth, Germany)

15:00 “Sparse and Precise Reconstruction of Static Obstacles for Real-Time Path Planning in Human-Robot Workspaces” Tobias Werner and Maximilian Sand (Universität Bayreuth, Germany); Dominik Henrich (University of Bayreuth, Germany)

15:20 “Identifying Human Hand Position around a Cylindrical Handlebar” Antony Tran (University of Technology, Sydney & Center for Autonomous Systems, Australia); Dikai Liu, Ravindra Ranasinghe and Marc Carmichael (University of Technology, Sydney, Australia)

15:40 Poster Session and Coffee Break

Session 6.3: Safe HRC
Chair: Alexander Meißner (Dürr Systems GmbH, Bietigheim-Bissingen, Germany)

16:00 “A user study on robot path planning inside a Virtual Reality environment” Christian Just, Tobias Ortmaier and Lüder A. Kahrs (Leibniz Universität Hannover, Germany)

16:20 “New concept of safety to realize improvement of higher productivity and safety in an environment of human-robot collaboration, and proposal of the concept of Collaboration Safety Level” Takayoshi Shimizu and Ikuo Maeda (IDEC Corporation, Japan)

16:40 “A Method for Robot Confidence Measurement in its Human” Antony Tran (University of Technology, Sydney & Center for Autonomous Systems, Australia); Dikai Liu, Ravindra Ranasinghe and Marc Carmichael (University of Technology, Sydney, Australia)
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<th>Time</th>
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<tr>
<td>16:00</td>
<td><strong>“Framework for automated program generation of HRC applications”</strong></td>
<td>Fabian S. Müller, Christian Deuerlein, Daniel Rücker, Michael Koch and Peter Heß (Technische Hochschule Nürnberg Georg Simon Ohm, Germany); Alexander Hasse (Technische Universität Chemnitz, Germany)</td>
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<tr>
<td>16:20</td>
<td><strong>“User-Centered Design of Multimodal Robot Feedback for Cobots of Human-Robot Working Cells in Industrial Production Contexts”</strong></td>
<td>Johannes Höcherl (OTH Regensburg, Germany); Maike Schmargendorf (University of Regensburg, Germany); Britta Wrede (Bielefeld University, Germany); Thomas Schlegl (OTH Regensburg, Germany)</td>
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<td>16:40</td>
<td><strong>“Collaboration-Gap: A bus-modular architecture for human-robot-collaboration systems in production environments”</strong></td>
<td>Markus Schiemann (Daimler AG &amp; Brandenburg University of Technology Cottbus-Senftenberg, Germany); Ulrich Berger (Brandenburg University of Technology, Germany); Jan Hodapp (Daimler AG &amp; Brandenburg University of Technology Cottbus-Senftenberg, Germany)</td>
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<td>17:00</td>
<td><strong>“Gesture based robot programming using ROS platform”</strong></td>
<td>Zoltán Forgó (Sapientia University, Romania); Alfred Hypki and Bernd Kühlenkötter (Ruhr-Universität Bochum, Lehrstuhl für Produktionssysteme (LPS), Germany)</td>
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**Session 5: New Robotics Applications**

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<th>Time</th>
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<tr>
<td>16:00</td>
<td><strong>“Learning Multi-Goal Inverse Kinematics in Humanoid Robot”</strong></td>
<td>Parijat Dewangan (International Institute of Information Technology, Hyderabad, India); Phaniteja Singamaneni (International Institute of Information Technology, India); K Madhava Krishna (IIIT H, India); Abhishek Sarkar (IIIT Hyderabad, India)</td>
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<td>16:20</td>
<td><strong>“Performance characterization and improvement of an underactuated robot gripper”</strong></td>
<td>Giovanni Carabin and Renato Vidoni (Free University of Bozen-Bolzano, Italy); Dominik T. Matt (Polytechnic University of Torino, Italy)</td>
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<td>17:00</td>
<td><strong>“TrimBot2020: an outdoor robot for automatic gardening”</strong></td>
<td>Nicola Strisciuglio (University of Groningen, The Netherlands); Radim Tylecek (University of Edinburgh, United Kingdom, (Great Britain)); Michael Blaich (Bosch, Germany); Nicolai Petkov (University of Groningen, The Netherlands); Peter Biber (Bosch, Germany); Jochen Hemming and Eldert van Herten (Wageningen University and Research, The Netherlands); Torsten Sattler and Marc Pollefeys (ETH Zurich, Switzerland); Theo Gevers (University of Amsterdam, The Netherlands); Thomas Brox (University of Freiburg, Germany); Robert Fisher (University of Edinburgh, United Kingdom (Great Britain))</td>
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17:20 Best Paper Award & Closing Ceremony

Plenary
General Information

Contact

For detailed information please contact:
VDE-Conference Services
Ms. Jasmin Kayadelen
Stresemannallee 15
60596 Frankfurt
Germany

Tel. +49 69 6308-275
Fax +49 69 6308-144
jasmin.kayadelen@vde.com

Website

Visit the ISR 2018 homepage for getting the latest information related to the conference: isr2018.org

Registration Desk Hours

Availability by E-mail on-site
jasmin.kayadelen@vde.com
Registration

Please visit isr2018.org for registration and information regarding the registration.

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<tr>
<td>Non-Member</td>
<td>EUR 770</td>
<td>EUR 870</td>
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<tr>
<td>VDE Member *</td>
<td>EUR 700</td>
<td>EUR 800</td>
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<tr>
<td>Students <em>/</em>*</td>
<td>EUR 150</td>
<td>EUR 200</td>
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<tr>
<td>Presenting Author (1 Paper)</td>
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Additional Bookings

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<tr>
<td>Dinner Ticket</td>
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<tr>
<td>additional Proceeding USB</td>
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** Excluding Conference Dinner. Can be purchased extra.

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All papers/posters accepted for presentation at the conference will be published as USB-Stick and included in IEEE Xplore. The USB-Stick will be handed on-site to all participants attending the conference.
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ISR 2018 will take place in the Press Center East, Entrance East. The Press Center East is connected to the Messe München exhibition center where the fair automatica will take place.

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For room reservation please check our website isr2018.org for accommodation.

Please be aware that parallel to ISR 2018 there are several events taking place. We therefore recommend to book your room early.

Venue

Messe München, East Entrance
Am Messeeturm 4, 81829 München, Germany

Find further information about planning your visit here: vde.com/isr-program
Social Program

Specially for ISR’s 50th edition to be the world’s leading robot conference the conference dinner will take place on June 20, 2018 in the original Munich Hofbräuhaus (hofbraeuhaus.de):

Departure for the evening event will be from the conference venue.

The attendance is included in the conference fee (except Day Registration). Additional tickets may be ordered.
The highlight of the conference’s gala dinner is the presentation of the final nominees of IERA Award and the Engelberger Award.

IERA Award

In 2005 the IEEE Robotics and Automation Society (IEEE/RAS) and the International Federation of Robotics (IFR) agreed to jointly sponsor the “Innovation and Entrepreneurship in Robotics and Automation”. The purpose of this award is to highlight and honor the achievements of the inventors with value creating ideas and entrepreneurs who propel those ideas into world-class products. At the same time the joint disposition of the award underlines the determination of both organizations to promote stronger collaboration between robotics science and robotics industry. The annual presented award consists of a plaque and a USD 2,000 honorarium.

Joseph F. Engelberger Award

Named after Joseph F. Engelberger, known throughout the world as the founding force behind industrial robotics, the Engelberger Robotics Award is the world’s most prestigious robotics honor. The awards are awarded to outstanding individuals to honor excellent achievements in technology development, application, education and leadership.

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