

# PROGRAMME

for the joint conference of



**ISR 2010**  
41st International Symposium  
on Robotics



**ROBOTIK 2010**  
6th German Conference  
on Robotics

**7-9 June 2010**

Parallel to

**AUTOMATICA**

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## Welcome of the Chairman of ISR 2010



From its very beginning in 1970 the International Symposium on Robotics (ISR) has been the most renowned and traditional conference on industrial robots worldwide and still it is. In 2010, the 41st ISR joins forces with the 6th German Conference on Robotics named ROBOTIK. The joint International Conference ISR/ROBOTIK 2010 will be held in Munich, Germany, from 7th to 9th of June.

The international trade fair for automation and mechatronics, AUTOMATICA, has again – like in 2006 – been chosen as conference platform. AUTOMATICA expects around 900 exhibitors and more than 30,000 visitors. As the fair will last two days longer than ISR/ROBOTIK 2010, there is the possibility and time for all conference participants to visit this interesting exhibition during and after the conference.

The overwhelming number of submitted abstracts for ISR/ROBOTIK 2010 demonstrates the growing interest in robotics and the increasing importance of its technologies being one of today's key components of modern industrial production and automation processes worldwide. In more than 160 presentations, held in five parallel sessions, ISR/ROBOTIK 2010 gives both, participants from industry and science, an insight to the latest state-of-the-art robot technology.

Additional highlights are the presentations of the final nominees of the IEEE/IFR Invention & Entrepreneurship Award (short: IERA) and the Engelberger Award Ceremony being held during the Conference Banquet. To make the programme perfect, a conference poster session and video presentations of latest robot developments can be visited between and parallel to the conference sessions.

The most traditional international robot conference, joined with Europe's largest robot trade and technology fair, certainly is the most important European event for the robot community worldwide. I wish the conference every success and all participants and visitors an interesting exchange and fruitful business contacts at the fair.

*Prof. Dr.-Ing. Rolf Dieter Schraft, Chair of ISR 2010  
On behalf of International Federation of Robotics (IFR)*

# Welcome of the Chairman of ROBOTIK 2010



ROBOTIK 2010 is the 6th in a series of German robotics conferences. It is organised by the German Association on Robotics (DGR), which is an umbrella organization for the coordination of scientific and technological robotics activities in Germany. For the 4th time it is taking place in parallel to the AUTOMATICA, the leading trade fair for automation and mechatronics. Furthermore, this is the second time that this conference is held together with the International Symposium on Robotics (ISR).

The robotics' research and development in Germany covers the full spectrum of robotics. Starting from world leading enterprises in industrial robotics up to small and medium sized companies, which are focusing on innovative service robots, robotics is an increasing market. Besides this, also the fundamental and application oriented research pursued by a huge number of universities and research institutes enjoys worldwide respect. The research activities have expanded during the last decades from purely industrial oriented robotics to humanoid and cognitive robotic systems.

Therefore, the areas of interests for ISR/ROBOTIK 2010 reflect all major aspects of robotic research and development. This conference provides a great opportunity for researchers and industrial developers to discuss and present their latest discoveries in robotics.

I wish the participants an interesting and pleasant conference.

*Prof. Dr. Karsten Berns, Chair of the ROBOTIK 2010  
On behalf of German Association on Robotics (DGR)*

## Organized by

- ITG (VDE) Information Technology Society of VDE
- VDMA Robotik + Automation
- IFR International Federation of Robotics
- DGR German Association on Robotics

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- Dirk Wollherr, Technische Universität München
- Jianwei Zhang, Universität Hamburg

## Invited Talks

Monday, 7 June, 11:45 AM – 12:30 PM

**Henrik A. Schunk**



**“Research Collaboration Against the Backdrop of the Global Economic Challenges”**

*Managing Partner, SCHUNK GmbH & Co. KG, Germany*

Tuesday, 8 June, 1 PM – 1:45 PM

**Dr. Claus Risager**



**“Robot technology driven innovation – examples and trends”**

*Center for Robot Technology,  
Danish Technological Institute, Denmark*

## Invited Talks

Wednesday, 9 June, 1 PM – 1:45 PM

**Dr. John F. Reid**



**“Field robotics driving off-road equipment productivity and convenience“**

*Director, Product Technology and Innovation, John Deere, USA*

Wednesday, 9 June, 1:45 PM – 2:30 PM

**Rolf Schumann**

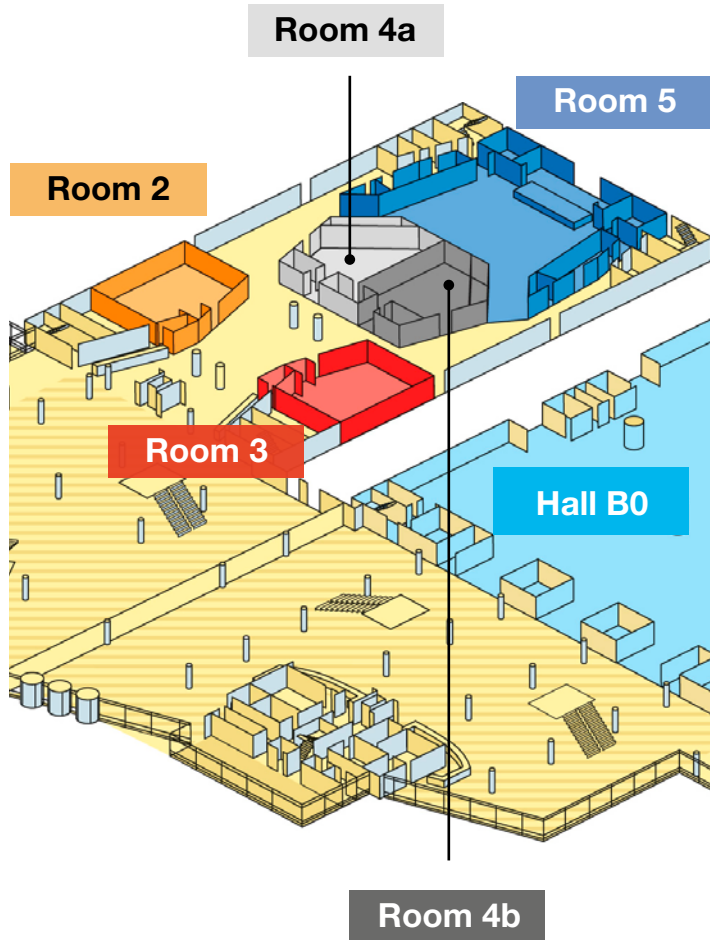


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# Location ICM

Farbcode



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# Technical Programme

Location/Farbcode

Room 2

Room 3

Room 4a

Room 4b

Room 5

**Monday, June 7, 2010**

9:45 AM - 10:00 AM Welcome of the Chairmen

**Room: 5**

*Rolf Dieter Schraft* (Fraunhofer IPA, Germany)  
*Karsten Berns* (Technische Universität  
Kaiserslautern, Germany)

**10:00 AM - 11:30 AM**

Tactile and Acoustic Sensing

**Room: 2**

*Chair: Mircea Ivanescu* (University of Craiova, Romania)

**10:00 Tracking blood vessels in human forearms using visual serving**

University of Southern Denmark, Denmark  
*Thiusius Rajeeth Savarimuthu*  
*Lars-Peter Ellekilde*

**10:20 Development of micro-force sensors for testing applications in micro- and nanorobotics**

University of Oldenburg, Germany  
*Manuel Mikczinski*  
*Tim Luttermann*  
*Thomas Wich*  
*Sergej Fatikow*

**10:40 Using a Piezo-Resistive Tactile Sensor for Detection of Incipient Slippage**

*Matthias Schöpfer* (Bielefeld University, Germany)  
*Carsten Schürmann* (Bielefeld University, Germany)  
*Michael Pardowitz* (Bielefeld University, Germany)  
*Helge Ritter* (Univ. Bielefeld, Germany)

**11:00 Applying von Mises Distribution to Microphone Array Probabilistic Sensor Modelling**

*Ivan Markovic* (University of Zagreb Faculty of  
Electrical Engineering and Computing, Croatia)  
*Ivan Petrovic* (University of Zagreb, Croatia)

Localization and Mapping 1

**Room: 3**

*Chair: Klaus Schilling* (University of Würzburg, Germany)

**10:00 Dynamic Frontier Based Exploration with a Mobile Indoor Robot**

*Jens Wettach* (University of Kaiserslautern, Germany)  
*Karsten Berns* (Technische Universität  
Kaiserslautern, Germany)

**10:20 Evaluating the efficiency of frontier-based exploration strategies**

*Dirk Holz* (University of Bonn, Germany)  
*Nicola Basilico* (Politecnico di Milano, Italy)  
*Francesco Amigoni* (Politecnico di Milano, Italy)  
*Sven Behnke* (University of Bonn, Germany)

**10:40 Sampling-Based Multi-Robot Exploration**

*Zhi Yan* (Advanced Computing Laboratory of  
Saint-Denis (LIASD), France)  
*Jouandeau Nicolas* (Computer Science & Artificial  
Intelligence Lab., France)  
*Ali-Chérif Arab* (University of Paris 8 SAINT-DENIS, France)

**11:00 Vision Based Far-Range Perception and Traversability Analysis using Predictive Probability of Terrain Classification**

*Masataka Suzuki* (Meiji University, Japan)

Learning and Adaptation

**Room: 4a**

*Chair: Raja Chatila* (LAAS-CNRS, France)

**10:00 Behavioral Organization for Mobile Robotic Systems: An Attractor Dynamics Approach**

*Matthias Grimm* (Ruhr-Universität Bochum, Germany);  
*Ioannis Iossifidis* (Ruhr-Universität Bochum, Germany)

**10:20 Traveling Wave Locomotion of Snake Robot Along Symmetrical and Unsymmetrical body shapes**

*Hadi Kalani* (Ferdowsi Mashhad, Iran)  
*Ali Akbarzadeh Tootoonchi* (Ferdowsi University  
of Mashhad, Iran)  
*Javad Safehian* (Ferdowsi Mashhad, Iran)

**10:40 Sensor Guided Robot Motions Using the Example of the Inverted Pendulum**  
*Alexander Winkler* (Chemnitz University of Technology, Germany)  
*Jozef Suchý* (Chemnitz University of Technology, Germany)

**11:00 An Adaptive Robot Game**  
*Søren Hansen* (Danish Technological Institute, Denmark)  
*Lars Dalgaard* (Danish Technological Institute, Denmark)

## Human-Robot Collaboration

**Room: 5**  
*Chair: Björn Hein* (Karlsruhe Institute of Technology (KIT), Germany)

**10:00 PISA: Next Generation of Flexible Assembly Systems - From Initial Ideas to Industrial Prototypes**  
Fraunhofer IPK, Germany  
*Jörg Krüger*  
*Volker Katschinski*  
*Dragoljub Surdilovic*  
*Gerhard Schreck*

**10:20 Development of Collaborative Robots (COBOTS) for Flexible Human-Integrated Assembly Automation**  
*Uwe Schmidt* (Schmidt-Handling GmbH, Germany)  
*Dragoljub Surdilovic* (Fraunhofer IPK, Germany)  
*Gerhard Schreck* (Fraunhofer IPK, Germany)

**10:40 Measuring the Collision Potential of Industrial Robots**  
Fraunhofer IPA, Germany  
*Susanne Oberer-Treitz*  
*Arnold Puzik*  
*Alexander Verl*

**11:00 Learning Probabilistic Models to Enhance the Efficiency of Programming-by-Demonstration for Industrial Robots**  
Fraunhofer IPA, Germany  
*Rebecca Hollmann*  
*Martin Hägele*  
*Alexander Verl*

## 11:30 AM - 11:45 AM

Coffee Break

## 11:45 AM - 12:30 PM

Invited Talk 1

**Room: 5**

**11:45 Research Collaboration Against the Backdrop of the Global Economic Challenges**  
*Henrik A. Schunk* (Schunk GmbH & Co. KG, Germany)

## 12:30 PM - 1:30 PM

Lunch Break

## 1:30 PM - 3:00 PM

3D Vision 1

**Room: 2**

*Chair: Jianwei Zhang* (University of Hamburg, Germany)

**1:30 Face Detection using 3D Time-of-Flight and Colour Cameras**  
Fraunhofer IPA, Germany  
*Jan Fischer*  
*Daniel Seitz*  
*Alexander Verl*

**1:50 Automatic Layered 3D Reconstruction of Simplified Object Models for Grasping**  
*Lucian Goron* (Technical University of Cluj-Napoca, Romania)  
*Zoltan Marton* (Technische Universität München, Germany)  
*Gheorghe Lazea* (Technical University of Cluj-Napoca, Romania)  
*Michael Beetz* (Technische Universität München, Germany)

**2:10 3D-Vision Guided Robotics for Material Handling**  
*Peter Nilsson* (Sick MP AB, Sweden)

## 3D Vision 1 (continued from previous page)

### 2:30 3D Measurement of Moving Objects using Quotient Image Stereo

Karlsruhe Institute of Technology (KIT), Germany

*Kirill Safronov*

*Igor Tchouchenkov*

*Stephan Irgenfried*

*Tagir Bakirov*

*Heinz Wörn*

## Localization and Mapping 2

### Room: 3

*Chair: Erwin Prassler* (University of Applied Sciences Bonn-Rhein-Sieg, Germany)

### 1:30 Exactly Sparse Delayed State Filter based robust SLAM with Stereo Vision

*Andreja Kitanov* (University of Zagreb, Croatia)

*Ivan Petrovic* (University of Zagreb, Croatia)

### 1:50 A Comparison of Efficient Global Image Features for Localizing Small Mobile Robots

*Marius Hofmeister* (University of Tuebingen, Germany)

*Philipp Vorst* (University of Tuebingen, Germany)

*Andreas Zell* (University of Tuebingen, Germany)

### 2:10 Off-road Place Recognition using Fused Image Features

*Tobias Föhst* (University of Kaiserslautern, Germany)

*Christiano Gava* (Universidade Federal do Espírito Santo, Brazil)

*Michael Arndt* (University of Kaiserslautern, Germany)

*Karsten Berns* (Techn. Universität Kaiserslautern, Germany)

*Raquel Vasallo* (Universidade Federal do Espírito Santo, Brazil)

### 2:30 Automatic Robot Supervision within a Lunar Crater Environment

*Alexander Dettmann* (DFKI GmbH - Robotics Innovation Center Bremen, Germany)

*Stefan Haase* (DFKI GmbH - Robotics Innovation Center Bremen, Germany)

## Industrial Human-Robot Cooperation

### Room: 4a

*Chair: Gisbert Lawitzky* (Siemens AG, Germany)

### 1:30 When to assist? – Modelling human behaviour for hybrid assembly systems

Ludwig Maximilian University, Germany

*Markus Huber*

*Thomas Brandt*

*Stefan Glasauer*

*Alois Knoll* (Technical University Munich, Germany);

### 1:50 Injury Risk Quantification for Industrial Robots in Collaborative Operation with Humans

*Bjoern Matthias* (ABB AG Corporate Research, Germany)

*Susanne Oberer-Treitz* (Fraunhofer IPA, Germany)

*Harald Staab* (ABB AG Corporate Research, Germany)

*Erich Schuller* (Ludwig-Maximilians-Universität München, Germany)

*Steffen Peldschus* (Ludwig-Maximilians-Universität München, Germany)

### 2:10 Occlusion Handling in Augmented Reality User Interfaces for Robotic Systems

*Markus Sauer* (Zentrum für Telematik e.V., Germany)

*Florian Leutert* (University of Würzburg, Germany)

*Klaus Schilling* (University of Würzburg, Germany)

### 2:30 Greenhouse Partner Robot System

*Koshi Kashiwazaki* (Tohoku University, Japan)

*Yusuke Sugahara* (Tohoku University, Japan)

*Jun Iwasaki* (Tohoku University, Japan)

*Kazuhiro Kosuge* (Graduate School of Engineering, Japan)

*Shiro Kumazawa* (Mayekawa MFG. Co., Ltd., Japan)

*Tomoki Yamashita* (Mayekawa MFG. Co., Ltd., Japan)

## Motion Planning

### Room: 5

*Chair: Dragoljub Surdilovic (Fraunhofer IPK, Germany)*

- 1:30 Dynamic Collision Avoidance for an Anthropomorphic Manipulator using a 3D TOF Camera**  
German Research Center for Artificial Intelligence (DFKI) GmbH, Bremen, Germany  
*Sankaranarayanan Natarajan*  
*Andreas Vogt*  
*Frank Kirchner*
- 1:50 Indoor-GPS based robots as a key technology for versatile production**  
Laboratory for Machine Tools and Production Engineering WZL, Germany  
*Robert Schmitt*  
*Alexander Schoenberg*  
*Björn Damm*
- 2:10 End-effector obstacle avoidance using multiple dynamic variables**  
Ruhr-Universität Bochum, Germany  
*Hendrik Reimann*  
*Ioannis Iossifidis*  
*Gregor Schöner*
- 2:30 Learning Motion Skills from Expert Demonstrations and Own Experience using Gaussian Process Regression**  
University of Bonn, Germany  
*Kathrin Gräve*  
*Jörg Stückler*  
*Sven Behnke*

### 3:00 PM - 4:00 PM

## Poster Session 1 and Coffee Break

- P1 Current State Model for easy Reconfiguration of Robot Systems and Offline-Programming-Environments**  
*Stefan Krug (Technische Universität München, Germany)*  
*Gunther Reinhard (Techn. Universität München, Germany)*
- P2 ABB Service Agreements with remote services**  
*René Nispeling (ABB Robotics, Sweden)*

- P3 Distributed Autonomous Control Architecture for Robotic Manufacturing Systems using Petri Net Based Multitask Processing**  
*Gen'ichi Yasuda (Nagasaki Institute of Applied Science, Japan)*
- P4 Intelligent Components for Miniature Drive Systems in Robotics**  
*Jens Haug (Dr. Fritz Faulhaber GmbH & Co. KG, Germany)*
- P5 Automatic Generation of the Denavit-Hartenberg Convention**  
*Wolfgang Weber (Hochschule Darmstadt -University of Applied Sciences -, Germany)*
- P6 Mechanical Design Process for the Zippy Wrist**  
Ferdowsi University of Mashhad, Iran  
*Navid Mahpeykar*  
*Javad Enferadi*  
*Ali Akbarzadeh Tootoonchi*
- P7 Remotely operated inspection and maintenance robots**  
ABB AS, Norway  
*Charlotte Skourup*  
*John Pretlove*  
*Christoffer Apneseth*
- P8 Towards a New Industrial Robotics**  
*Fabio Bonsignorio (University Carlos III de Madrid, Italy)*
- P9 An Autonomous Robotized System for a Thermographic Camera**  
*Enrico Pagello (University Padova, Italy)*
- P10 Low-Power Microcontroller-based Acoustic Modem for Underwater Robot Communication**  
University of Luebeck, Germany  
*Christoph Osterloh*  
*Erik Maehle*
- P11 Particle Filter Based Sensor Fusion of Range Measurements from Wireless Sensor Network and Laser Range Finder**  
University of Applied Sciences and Arts in Dortmund, Germany  
*Christof Röhrig*  
*Christopher Kirsch*

- P12 Fuzzy Stereovision Tracking Control for Non-holonomic Mobile Robots**  
Military Polytechnic College, Algeria  
*Mohand Saïd Djouadi*  
*Samir Zeghlache*
- P13 Pattern Recognition and Tracking Dynamic Objects with LIDAR**  
*Levente Tamas* (Technical University of Cluj-Napoca, Romania)
- P14 Experimental Evaluation of a Low-cost Mobile Robot Localization Technique for Large Indoor Public Environments**  
University of Applied Sciences Bonn-Rhein-Sieg, Germany  
*Inam Haque*  
*Erwin Prassler*
- P15 3-D-Environment Reconstruction for mobile Robots using fastSLAM and feature extraction**  
Fraunhofer IPA, Germany  
*Georg Arbeiter*  
*Jan Fischer*  
*Alexander Verl*
- P16 Map updating in dynamic environments**  
Politecnico di Torino, Italy  
*Fabrizio Abrate*  
*Basilio Bona*  
*Marina Indri*  
*Stefano Rosa*  
*Federico Tibaldi*
- P17 New Approach in Solving the Kidnapped Robot Problem**  
Technical University of Cluj-Napoca, Romania  
*Andras Majdik*  
*Mircea Popa*  
*Levente Tamas*  
*Istvan Szoke*  
*Gheorghe Lazea*
- P18 AUV Pipeline Following using Reinforcement Learning**  
Sintef ICT, Norway  
*Sigurd Fjerdingen*  
*Aksel Transeth*  
*Erik Kyrkjebø*

**4:00 PM - 5:30 PM**

**3D Vision 2**

**Room: 2**

*Chair: Jozef Suchý*  
(Chemnitz University of Technology, Germany)

- 4:00 Probabilistic Phase Unwrapping for Time-of-Flight Cameras**  
*David Droeschel* (University of Bonn, Germany)  
*Sven Behnke* (University of Bonn, Germany)
- 4:20 High Performance Optical Flow Serves Bayesian Filtering for Safe Human-Robot Interaction**  
*Jürgen Graf* (Universität Karlsruhe (TH), Germany)
- 4:40 Mobile Manipulation in Service Robotics: Scene and Object Recognition with Manipulator-Mounted Laser Ranger**  
University of Applied Sciences Ulm, Germany  
*Manuel Wopfner*  
*Jonas Brich*  
*Siegfried Hochdorfer*  
*Christian Schlegel*
- 5:00 Development of a Robot Vision System for Measuring 3D Pose of Large Object Using Virtual Plane Algorithm**  
*Chan-Ho Lee* (Hyundai Heavy Industries Co., LTD., Korea)  
*Jong-Kyu Oh* (Hyundai Heavy Industries Co., Ltd., Korea)  
*Sang-Hun Lee* (Hyundai Heavy Industries Co., LTD., Korea)  
*Sung-Hyun Jung* (Hyundai Heavy Industries Co., LTD., Korea)  
*Jong-Sung Hur* (Hyundai Heavy Industries Co., LTD., Korea)  
*Sangbum Park* (Soongsil University, Korea)  
*Hernsoo Hahn* (Soongsil University, Korea)  
*Youngjoon Han* (Soongsil University, Korea)

## Localization and Mapping 3

### Room: 3

*Chair: Jürgen Wahrburg* (University of Siegen, Germany)

#### 4:00 Performances evaluation of Global Navigation Satellite Systems and Satellite/Ground Based Augmentation Systems in mobile robotics

*Carmelo Donato Melita* (University of Catania, Italy)  
*Giovanni Muscato* (University of Catania, Italy)  
*Michele Poncelet* (Nav On Time, France)

#### 4:20 A Comparison of Similarity Measures for Localization with Passive RFID Fingerprints

*Philipp Vorst* (University of Tuebingen, Germany)  
*Andreas Zell* (University of Tuebingen, Germany)

#### 4:40 UKF Sensor Data Fusion for Localisation of a Mobile Robot

*Matthias Baumann* (University of Würzburg, Germany)  
*Daniel Eck* (University of Würzburg, Germany)  
*László Lemmer* (University of Würzburg, Germany)  
*Klaus Schilling* (University of Würzburg, Germany)

#### 5:00 Stabilizing and Global Localizing of Two-Wheeled Holonomic Mobile Robots Using Neuro-Fuzzy Algorithms

*Hans Hansen* (Technische Universität Vaduz, Liechtenstein)

## Personal Human-Robot Cooperation

### Room: 4a

*Chair: Heinz Ulbrich* (TUM, Germany)

#### 4:00 FRIEND – a Dependable Semiautonomous Rehabilitation Robot

*Roko Tschakarow* (SCHUNK GmbH & Co KG, Germany)  
*Sorin Grigurescu* (University of Bremen, Germany)  
*Axel Graeser* (University of Bremen, Germany)

#### 4:20 Pneumatic Rehabilitation Robot: Modeling and Control

*Ricardo Morales* (Miguel Hernandez University, Spain);  
*Francisco Badesa* (Miguel Hernandez University, Spain);  
*Luis Maria Lopez* (Miguel Hernandez University, Spain);  
*Nicolas Garcia-Aracil* (Miguel Hernandez University, Spain);  
*Jose Maria Sabater* (Miguel Hernandez University, Spain);  
*Carlos Perez* (Miguel Hernandez University, Spain);  
*Eduardo Fernández* (University Miguel Hernández, Spain);  
*Manuel Menchón* (Fundación Casaverde, Spain)

#### 4:40 Human in Loop Integration of An Arm Mounted Wheelchair Robot Based on RT Middleware

*Wei Wang* (Waseda University, Japan)

#### 5:00 Intuitive Multimodal Interaction for Domestic Service Robots

*University of Bonn, Germany*  
*Matthias Nieuwenhuisen*  
*Jörg Stückler*  
*Sven Behnke*

## Robot Control of Machining Processes

### Room: 5

*Chair: Rezia Molfino* (University of Genoa, Italy)

#### 4:00 Markerless visual vibration damping of a 3-DOF flexible link robot arm

*Technische Universität Dortmund, Germany*  
*Jörn Malzahn*  
*Anh Son Phung*  
*Rene Franke*  
*Frank Hoffmann*  
*Torsten Bertram*

#### 4:20 A Motion Control Strategy for Robots in Laser Material Processing and other High Speed Applications

*Hochschule Aschaffenburg University of applied sciences, Germany*  
*Hartmut Bruhm*  
*Alexander Czinki*  
*Markus Lotz*  
*Volker Wenzel* (Hochschule Aschaffenburg, Germany)

#### 4:40 Robot Machining with additional 3D-Piezo-Actuation Mechanism for Error Compensation

*Fraunhofer IPA, Germany*  
*Arnold Puzik*  
*Christian Meyer*  
*Alexander Verl*

#### 5:00 A feedback control system for a rapid production process based on robotic welding deposition

*Filippo Bonaccorso* (Università degli studi di Catania, Italy)  
*Giovanni Muscato* (University of Catania, Italy)  
*Luciano Cantelli* (University of Catania, Italy)

#### 5:30 Welcome Reception

**Tuesday, June 8, 2010**

**8:45 AM - 10:15 AM**

### Applications for Vision Sensors

**Room: 2**

*Chair: Alois Knoll (Technical University Munich, Germany)*

**8:45 Robotic Vision for Bin-Picking Applications of Various Objects**

Brno University of Technology, Czech Republic

*Ales Pochyly*

*Tomas Kubela*

Blumenbecker Prag s.r.o. company, Czech Republic

*Martin Kozak*

*Petr Cihak*

**9:05 Automatic Configuration of an Object Detection System**

*Martin Stotz (Fraunhofer IPA, Germany)*

*Alexander Verl (Fraunhofer IPA, Germany)*

**9:25 Anticipation-Preprocessing for Object Pose Detection**

Fraunhofer IPA, Germany

*Matthias Palzkill*

*Thomas Ledermann*

*Alexander Verl*

**9:45 Camera Calibration for Reliable Object Manipulation in Care-providing System FRIEND**

University of Bremen, Germany

*Torsten Heyer*

*Sorin Grigurescu*

*Axel Graeser*

### Path Planning and Navigation 1

**Room: 3**

*Chair: Philipp Vorst (University of Tuebingen, Germany)*

**8:45 A set-based dynamic window algorithm for robust and safe mobile robot path planning**

*Sylvia Horn (TU Dresden, Germany)*

*Klaus Janschek (TU Dresden, Germany)*

**9:05 A RRT based path planning algorithm for Rehabilitation robots**

*Christos Fragkopoulos (University of Bremen, Germany)*

*Axel Graeser (University of Bremen, Germany)*

**9:25 A new Probabilistic Path Planning Algorithm for (Dis)assembly Tasks**

*Ulrike Thomas (German Aerospace Center, Germany)*

*Rene Iser (Institute for Robotics and Process Control, Germany)*

**9:45 Path Planning Process Optimization for a Bin Picking System**

*Ricardo Tauro (Karlsruhe Institute of*

*Technology (KIT), Germany)*

### Industrial Grasping Applications

**Room: 4a**

*Chair: Norbert Elkmann (Fraunhofer IFF, Germany)*

**8:45 Hybrid Robot Gripper and Tools for Handling and Bonding Micro Fluidic Chips**

*Agathe Koller (University of Applied Sciences*

*Rapperswil, Switzerland)*

*Manuel Altmeyer (University of Applied Sciences*

*Rapperswil, Switzerland)*

*Silvio Walpen (University of Applied Sciences, Switzerland)*

*Markus Lüthy (Weidmann Plastics Technology AG, Switzerland)*

*Edi Krüttli (Weidmann Plastics Technology AG, Switzerland)*

*Janko Auerswald (CSEM SA, Switzerland)*

*Florian Kehl (CSEM SA, Switzerland)*

**9:05 Visual Grasping Using Passive Joints and Clustered SIFT-Features**

*Nicolas Gorges (Karlsruhe Institut of Technology, Germany)*

*Heinz Wörn (Karlsruhe Institute of Technology (KIT), Germany)*

**9:25 Gripping Systems for Intralogistics - Aiming at the "Swiss Army Knife" of Intralogistics Solutions**

*Hendrik Muetherich (Fraunhofer IPA, Germany)*

*Florian Simons (SCHUNK GmbH & Co. KG, Germany)*

*Alexander Verl (Fraunhofer IPA, Germany)*

## Industrial Grasping Applications

### 9:45 **A new handling system for textile/clothing industry**

University of Genoa, Italy

*Rezia Molfino*

*Matteo Zoppi*

*Enrico Carca*

*Roberto Avvenente*

## IERA Session 1

### Room: 4b

**Special session where the finalists of this year's IFR/IEEE-RAS Invention and Entrepreneurship in Robotics and Automation Award will be presenting**

## Force Torque Control

### Room: 5

*Chair: Alin Albu-Schäffer (DLR, Germany)*

### 8:45 **Is a Linear Axis Really Required When Assembling Parts to a Moving Conveyor?**

German Aerospace Center (DLR), Germany

*Friedrich Lange*

*Johannes Scharrer*

*Gerd Hirzinger*

### 9:05 **Control of Large Forces and Torques Using an Asymmetrically Arranged Compliant Sensor**

German Aerospace Center (DLR), Germany

*Friedrich Lange*

*Bertram Willberg*

*Gerd Hirzinger (Deutsches Zentrum für Luft- und Raumfahrt e.V., Germany)*

### 9:25 **Is Force Monitoring in Cooperating Industrial Robots Necessary?**

*Sherif Zaidan (Technical University of Munich, Germany)*

### 9:45 **Superimposed Force/Torque-Control of Cooperating Robots**

Fraunhofer IPA, Germany

*Alexander Spiller*

*Alexander Verl*

## 10:15 AM - 10:30 AM

### Coffee Break

## 10:30 AM - 12:00 PM

### Safety Applications

#### Room: 2

*Chair: Axel Graeser (University of Bremen, Germany)*

### 10:30 **A real-time wearable projector-wiimote-system for augmented reality interaction scenarios on plane objects**

Karlsruhe Institute of Technology (KIT), Germany

*Alexander Steiger*

*Björn Hein*

*Heinz Wörn*

### 10:50 **A Stationary Sensor System to Support Manipulators for Safe Human-Robot Interaction**

*Christoph Walter (Fraunhofer IFF, Germany)*

*Christian Vogel (University of Magdeburg, Germany)*

*Norbert Elkmann (Fraunhofer IFF, Germany)*

### 11:10 **Collision Avoidance Systems for Manual-Assisted Driving**

Research Institute of Design and Manufacturing,

Technical University of Valencia, Spain

*Héctor Yuste*

*Leopoldo Armesto*

*Josep Tornero*

### 11:30 **PISALA project: Intelligent sensorization for Line tracking with Artificial Vision**

*Vicent Girbes (Technical University of Valencia, Spain)*

*Leopoldo Armesto (Research Institute of Design and Manufacturing, Technical University of Valencia, Spain)*

*Josep Tornero (Research Institute of Design and Manufacturing, Technical University of Valencia, Spain)*

### Path Planning and Navigation 2

#### Room: 3

*Chair: Klaus-Dieter Kuhnert (University of Siegen, Germany)*

### 10:30 **Cooperative Docking Procedures for a Lunar Mission**

*Thomas Roehr (DFKI GmbH, Germany)*

*Florian Cordes (DFKI GmbH, Germany)*

## Path Planning and Navigation 2 (continued from previous page)

### 10:50 Deploying Mobile Maintenance Robots in Material Flow Systems Using Topological Maps and Local Calibration

TU Dortmund University, Industrial Robotics and Production Automation, Germany

*Bernd Kuhlenkötter*

*Matthias Bücken*

*Tobias Brutscheck*

### 11:10 Evaluating Risk Estimation Methods and Path Planning for Safe Human-Robot Cooperation

*Jürgen Graf* (Universität Karlsruhe (TH), Germany)

### 11:30 Experimental Study Of Robot Formation Control And Navigation Using Potential Functions And Panel Method

*Abdel-Razzak Merheb* (Tobb university of Economics and Technology, Turkey)

*Veysel Gazi* (TOBB ETU, Turkey)

*Nilay Sezer Uzol* (TOBB ETU, Turkey)

## Anthropomorphic Arms and Hands

### Room: 4a

*Chair: Tamim Asfour* (Karlsruhe Institute of Technology (KIT), Germany)

### 10:30 A Five Fingered Robotic Hand Prototype by using Twist Drive

*Ivan Godler* (University of Kitakyushu, Japan)

*Takashi Sonoda* (Fukuoka Industry, Science & Technology Foundation, Japan)

### 10:50 Grasp synthesis for dextrous hands optimised for tactile manipulation

University of Southern Denmark, Denmark

*Jimmy Jørgensen*

*Henrik Petersen*

### 11:10 Development of a Multi-fingered Robot Hand with Softness-changeable Skin Mechanism

*Hiroki Takeuchi* (Kanazawa University, Japan)

*Watanabe* (Kanazawa University, Japan)

### 11:30 On the control problem of a hyper-redundant arm

University of Craiova, Romania

*Mircea Ivanescu*

*Mihaela Florescu*

University Politehnica of Bucharest, Romania

*Nirvana Popescu*

*Decebal Popescu*

## IERA Session 2

### Room: 4b

**Continuation of IERA Session 1 with presentations of 3 more finalists.**

## Simulation and Programming

### Room: 5

*Chair: Alfred Hypki* (Technische Universität Dortmund, Germany)

### 10:30 Recent Progress on Programming Methods for Industrial Robots

University of Wollongong, Australia

*Zengxi Pan*

*Joseph Polden*

*Nathan Larkin*

*Stephen van Duin*

### 10:50 Robot cutting in ship building industry - A new flexible approach for linking parametric design and fully automatic robot programming

Autocam Informationstechnik GmbH, Germany

*Jobst Bickendorf*

*Stefan Gasper*

### 11:10 Automatic Generation of Robot Applications using a Knowledge Integration Framework

Fraunhofer IPA, Germany

*Martin Naumann*

*Matthias Bengel*

*Alexander Verl*

### 11:30 RWSim - an open simulator for sensor based grasping

University of Southern Denmark, Denmark

*Jimmy Jørgensen*

*Henrik Petersen*

12:00 PM - 1:00 PM

Lunch Break

1:00 PM - 1:45 PM

Invited Talk 2

Room: 5

1:00 **Robot Technology Driven Innovation -  
Examples and Trends**

*Claus Risager* (Danish Technological Institute, Denmark)

1:45 PM - 3:15 PM

Exploration and Perception

Room: 2

*Chair: Sven Behnke* (University of Bonn, Germany)

1:45 **Robotic Analysis of Everyday Scenes**

*Gisbert Lawitzky* (Siemens AG, Germany)

2:05 **Visual Odometry Using Feature Point and  
Ground Plane for Urban Environments**

*Atsushi Sakai* (Meiji University, Japan)

2:25 **Multi-Sensor Fusion for Localization of a Mobile  
Robot in Outdoor Environments**

*Thomas Emter* (Fraunhofer IOSB, Germany)

*Arda Salto lu* (Fraunhofer IOSB, Turkey)

*Janko Peterleit* (Fraunhofer IOSB, Germany)

2:45 **Online Road Surface Analysis using Laser  
Remission in Structured Outdoor Environments**

*Teppeï Saitoh* (Meiji University, Japan)

Humanoid Robotics 1

Room: 3

*Chair: Ruediger Dillmann* (Karlsruhe Institute of  
Technology (KIT), Germany)

1:45 **Development of a highly integrated torque sensor  
concept for drive units of a humanoid robot**

*KIT - Karlsruhe Institute of Technology, Germany*

*Albert Albers*

*Christian Sander*

*Markus Frietsch*

*Jens Ottnad*

2:05 **Mobile experimental platform for the development  
of environmentally interactive control algorithms  
towards the implementation on a walking  
humanoid robot**

*Fraunhofer IOSB, Germany*

*Giulio Milighetti*

*Janko Peterleit*

*Helge-Björn Kuntze*

2:25 **Study of a bipedal robot with elastic elements**

*Daniela Förg* (Technische Universität München, Germany)

*Andre Seyfarth* (University Jena, Germany)

*Heinz Ulbrich* (TUM, Germany)

2:45 **Towards Human-Like Bipedal Locomotion with  
Three-Segmented Elastic Legs**

*Technische Universität Darmstadt, Germany*

*Katayon Radkhah*

*Dorian Scholz*

*Oskar von Stryk*

*Friedrich Schiller University of Jena, Germany*

*Moritz Maus*

*Andre Seyfarth*

Vision-Based Manipulation

Room: 4a

*Chair: Friedrich M. Wahl* (Technical University of  
Braunschweig, Germany)

1:45 **Refining visually detected object poses**

*University of Southern Denmark, Denmark*

*Preben Holm*

*Henrik Petersen*

2:05 **Development of Image Guided Master-Slave Robot  
System for Minimal Invasive Brain Surgery**

*Sukho Park* (Chonnam National University, Korea)

## Vision-Based Manipulation (continued from previous page)

### 2:25 Image processing for sensing guide wire behaviour during endovascular surgery simulation

*Carlos Tercero* (Nagoya University, Japan)  
*Seiichi Ikeda* (Nagoya University, Japan)  
*Toshio Fukuda* (Nagoya University, Japan)  
*Makoto Negoro* (Fujita Health University, Japan)

### 2:45 To Paint What Is Seen: A System Implementation of a Novel Conceptual Hyper-Redundant-Chain Robot With Monocular Vision

*KeJun Ning* (University of Goettingen, Germany)  
*Florentin Wörgötter* (Inst. of Physics III, University of Göttingen, Germany)

## Invited Industrial Session 1

### Room: 4b

*Chair: Andreas Wolf* (robomotion GmbH, Germany)

### 1:45 euRobotics - Shaping the future of European robotics

*Rainer Bischoff* (KUKA Roboter GmbH, Germany)  
*Tim Guhl* (KUKA Roboter GmbH, Germany)  
*Anne Wendel* (EUnited aisbl, Belgium)  
*Fariba Khatami* (EUnited aisbl, Belgium)  
*Herman Bruyninckx* (Katholieke Universiteit Leuven, Belgium)  
*Bruno Siciliano* (Università degli Studi di Napoli Federico II, Italy)  
*Geoff Pegman* (R.U. Robots Limited, England)  
*Martin Hägele* (Fraunhofer IPA, Germany)  
*Erwin Prassler* (GPS Gesellschaft für Produktionssysteme GmbH, Germany)  
*Thilo Zimmermann* (GPS Gesellschaft für Produktionssysteme GmbH, Germany)  
*Jon Agirre Ibarbia* (Fatronik Tecnalia, Spain)  
*Christophe Leroux* (Commissariat à l'Energie Atomique, France)  
*Bruno Tranchero* (Alenia Aeronautica S.P.A., Italy)  
*Roberto Labruto* (Alenia Aeronautica S.P.A., Italy)  
*Alois Knoll* (Technische Universität München, Germany)  
*Reinhard Lafrenz* (Technische Universität München, Germany)

### 2:05 Optimized SCARA kinematic, description and examples

*Volker Spanier* (Epson Deutschland GmbH, Germany)

### 2:25 The KUKA-DLR Lightweight Robot arm - a new reference platform for robotics research and manufacturing

KUKA Roboter GmbH, Germany

*Rainer Bischoff*  
*Johannes Kurth*  
*Günter Schreiber*  
*Ralf Koeppel*

Deutsches Zentrum für Luft- und Raumfahrt e.V., Germany

*Andreas Stemmer*  
*Alin Albu-Schäffer*  
*Sami Haddadin*  
*Oliver Eiberger*  
*Alexander Beyer*  
*Gerhard Grunwald*  
*Gerhard Hirzinger*

### 2:45 Improve Safety and Reduce Cost: Dual Check Safety (DCS) Speed and Position Check Software

*Josef Fruhmann* (FANUC Robotics Deutschland GmbH, Germany)

## Industrial Robot Modeling

### Room: 5

*Chair: Markus Vincze* (Vienna University of Technology, Austria)

### 1:45 Analysis of the Accuracy of Industrial Robots and Laser Scanners for Remote Laser Beam Welding and Cutting

Technische Universitaet Muenchen, Germany

*Michael F. Zaeh*  
*Jens Hatwig*  
*Jan Musiol*  
*Oliver Roesch*  
*Gunther Reinhart*

### 2:05 „Viro-Con“: Efficient Deployment of Modular Robots

*Ulrich Schmucker* (Fraunhofer IFF, Germany)  
*Eric Bayrhammer* (Fraunhofer IFF, Germany)  
*Matthias Kennel* (Fraunhofer IFF, Germany)  
*Roko Tschakarow* (SCHUNK GmbH & Co KG, Germany)

### 2:25 Inertia parameter identification using a Stewart Platform

*Juan Barreto* (Universidad de los Andes, Colombia)  
*Luis E Munoz* (Universidad de Los Andes, Colombia)

**2:45 Calibration Techniques for Industrial Mobile Manipulators: Theoretical configurations and Best practices**

Aalborg University, Denmark

*Mads Hvilshøj*

*Simon Bøgh*

*Ole Madsen*

*Morten Kristiansen*

**3:15 PM - 4:15 PM**

Poster Session 2 and Coffee Break

**P19 Biped Robot „ROTTÖ“: Design, Simulation, Experiments**

*Mykhaylo Konyev* (Otto-von-Guericke-University Magdeburg, Germany)

*Frank Palis* (Otto-von-Guericke-University Magdeburg, Germany)

*Andriy Melnykov* (Otto-von-Guericke-University Magdeburg, Germany)

*Ulrich Schmucker* (Fraunhofer IFF, Germany)

**P20 The Energy Minimization Algorithm Using Foot Rotation For Hydraulic Actuated Quadruped Walking Robot with Redundancy**

KITECH, Korea

*Tae-Ju Kim*

*Byungrok So*

*Ohung Kwon*

*Sangdoek Park*

**P21 Development and Analysis of a Shape-Conformable Supporting Head for a Self-Reconfigurable Intelligent Swarm Fixture System**

*Xiong Li* (University of Genova, Italy)

**P22 RobWork: A Flexible Toolbox for Robotics Research and Education**

University of Southern Denmark, Denmark

*Lars-Peter Ellekilde*

*Jimmy Jørgensen*

**P23 An Integrated Tool Suite for Simulation and Programming of Palletizing Units**

*Mauro Argenti* (University of Parma, Italy)

*Davide Buratti* (OCME S.r.l., Italy)

*Dario Lodi Rizzini* (Università degli Studi di Parma, Italy)

*Stefano Caselli* (University of Parma, Italy)

**P24 A Co-simulation Framework for Design, Test and Parameter Optimization of Robotic Systems**

*Mohammed Ahmed* (Universität Bremen, Germany)

German Research Center for Artificial Intelligence (DFKI) GmbH, Bremen, Germany

*Yong-Ho Yoo*

*Frank Kirchner*

**P25 An autonomous excavator project for landscaping tasks**

Technische Universität Kaiserslautern, Germany

*Daniel Schmidt*

*Karsten Berns*

**P26 UMTS One Way Delay Characterization for Mobile Robot Teleoperation**

*Florian Zeiger* (Zentrum für Telematik, Germany)

*Florian Kempf* (Zentrum für Telematik, Germany)

*Klaus Schilling* (University of Würzburg, Germany)

**P27 Integrated robot gluing system**

*Thomas Wagner* (ABB, Germany)

**P28 Ambient Integrated Robotics (AIR): new approach for supporting elderly people with integrated technology in living environments**

*Thomas Bock* (Technische Universität München, Germany)

*Norbert Linner* (TU München, Germany)

*Y. S. Lee* (TU München, Germany)

**P29 Measurement of Stress Distribution of Flexible Wheels for Lunar Rover**

*Kojiro Iizuka* (Shinshu University, Japan)

**P30 Architecture of an autonomous mini unmanned aerial vehicle based on a commercial platform**

University of Siegen, Germany

*Markus Ax*

*Lars Kuhnert*

*Matthias Langer*

*Jens Schlemper*

*Klaus-Dieter Kuhnert*

**P31 Kinematic Analysis for Total Knee Replacement Surgery: Toward Development of A Novel Robot-Assisted TKR Surgical System**

*Jackrit Suthakorn* (Mahidol University, Thailand)

*Piyawan Moonjaita* (Mahidol University, Thailand)

*Chumpol Wilasrusmee* (Mahidol University, Thailand)

**P32 Automatic Trajectory Generation for Robotic Painting Application**

*Xiongzi Li* (ABB Robotics, USA)

*Oeyvind Landsnes* (ABB Robotics, Norway)

**P33 A Flexible Real-Time Control System for Autonomous Vehicles**

*Johannes Meyer* (Technische Universität Darmstadt, Germany)

*Armin Strobel* (Technische Universität Darmstadt, Germany)

**P34 Path planning of reach tasks for dual-arm robots**

*Anders L Olsen* (University of Southern Denmark, Denmark)

*Henrik Petersen* (University of Southern Denmark, Denmark)

**P35 Self-adaptable passive gripping system for industrial robots**

*Torsten Felsch* (Fraunhofer IFF, Germany)

*Christian Herker* (Fraunhofer IFF, Germany)

**P36 Flexible Assembly Systems through Workplace-Sharing and Time-Sharing Human-Machine Cooperation (PISA)**

Fraunhofer IPK, Germany

*Jörg Krüger*

*Volker Katschinski*

*Dragoljub Surdilovic*

*Gerhard Schreck*

**P37 The Basis of Control-Related Robotics Research – Open High-Rate Low-Level Control Architectures for Industrial Manipulators**

TU Braunschweig, Germany

*Alexander Sommerkorn*

*Daniel Kubus*

*Friedrich M. Wahl*

**P38 Development of a Novel HyRoHILS System and Its Application to Parameter Identification of an Industrial Robot**

Hyundai Heavy Industries Co., LTD., Korea

*Seung-Woo Son*

*Eui-Jin Kim*

*Chan-Ho Lee*

*Sang-Hun Lee*

*Sung-Hyun Jung*

*Jong-Sung Hur*

**4:15 PM - 5:45 PM**

**Service Robots 1**

**Room: 2**

*Chair: Jong-Oh Park* (Chonnam National University, Korea)

**4:15 Development of Robotic Transportation System for Shopping Support Services**

*Nobuto Matsuhira* (Toshiba Corporation, Japan)

*Seiji Tokura* (Toshiba Corporation, Japan)

*Takafumi Sonoura* (Toshiba Corporation, Japan)

*Tsuyoshi Tasaki* (Toshiba Corporation, Japan)

*Masahito Sano* (Toshiba Corporation, Japan)

*Kiyoshi Komoriya* (Tokyo Metropolitan Industrial Technology Research Institute, Japan)

*Fumio Ozaki* (Toshiba Corporation, Japan)

*Hideki Ogawa* (Toshiba Corporation, Japan)

*Akiko Numata* (Toshiba Corporation, Japan)

*Naohisa Hashimoto* (National Institute of Advanced Industrial Science and Technology, Japan)

**4:35 Treading new water with a fully automatic sewer inspection system**

*José Saenz* (Fraunhofer IFF, Germany)

*Norbert Elkmann* (Fraunhofer IFF, Germany)

*Christoph Walter* (Fraunhofer IFF, Germany)

*Erik Schulenburg* (Fraunhofer IFF, Germany)

*Heiko Althoff* (Emschergenossenschaft, Germany)

## Service Robots 1 (continued from previous page)

### 4:55 **BioRob-Arm: A Quickly Deployable and Intrinsically Safe, Light-Weight Robot Arm for Service Robotics Applications**

Technische Universität Darmstadt, Germany

*Thomas Lens*

*Jürgen Kunz*

*Oskar von Stryk*

Tetra GmbH, Ilmenau, Germany

*Andreas Karguth*

*Christian Trommer*

### 5:15 **Task Learning for Behavior-based Mobile Manipulation**

Katholieke Universiteit Leuven, Belgium

*Shu Huang*

*Erwin Aertbeliën*

*Hendrik Van Brussel*

*Herman Bruyninckx*

## Humanoid Robotics 2

### Room: 3

*Chair: Michael Gienger* (Honda Research Institute Europe, Germany)

### 4:15 **A biomimetic upper body for humanoids**

Politecnico di Milano, Italy

*Giuseppina Gini*

*Michele Folgheraiter*

*Ilaria Baroni*

*Francesco Boschetti*

*Gert Petja*

*Marco Traversoni*

### 4:35 **Generation of Human-like Motion for Humanoid Robots Based on Marker-based Motion Capture Data**

Karlsruhe Institute of Technology (KIT), Germany

*Stefan Gaertner*

*Martin Do*

*Christian Simonidis*

*Tamim Asfour*

*Wolfgang Seemann*

*Ruediger Dillmann*

### 4:55 **Scene Representation for Anthropomorphic Robots: A Dynamic Neural Field Approach**

Ruhr-Universität Bochum, Germany

*Stephan Zibner*

*Christian Faubel*

*Ioannis Iossifidis*

*Gregor Schöner*

### 5:15 **A Humanoid Muscle Robot Torso with Biologically Inspired Construction**

*Ivo Boblan* (Technische Universität Berlin, Germany)

*Andreas Schulz* (Technische Universität Berlin, Germany)

## New Manipulation Technologies

### Room: 4a

*Chair: Heinz Wörn* (Karlsruhe Institute of Technology (KIT), Germany)

### 4:15 **A new concept of modular kinematics to design ultra-high precision flexure-based robots**

*Murielle Richard* (Swiss Federal Institute of Technology Lausanne (EPFL), Switzerland)

*Reymond Clavel* (EPFL, Switzerland)

### 4:35 **Experiments with Tentacle Robots**

University of Craiova, Romania

*Dorian Cojocaru*

*Mircea Ivanescu*

*Florin Manta*

*Sorin Dumitru*

*Razvan Tanasie* (University of Craiova, Faculty of Automation, Computers and Electronics, Romania)

### 4:55 **Observation-Oriented Design of a Monolithic Piezoelectric Microactuator with Optimally Integrated Sensor**

*Roba El Khoury Moussa* (CEA-LIST, France)

*Mathieu Grossard* (CEA-LIST, France)

*Nicolas Chaillet* (FEMTO-ST, France)

*Mehdi Boukallel* (CEA-LIST, France)

*Arnaud Hubert* (FEMTO-ST, France)

## Invited Industrial Session 2

### Room: 4b

*Chair: Josef Fruhmann*  
(FANUC Robotics Deutschland GmbH, Germany)

#### 4:15 **BRICS -Best practice in robotics**

*Rainer Bischoff* (KUKA Roboter GmbH, Germany)  
*Tim Guhl* (KUKA Roboter GmbH, Germany)  
*Erwin Prassler* (GPS Gesellschaft für Produktionssysteme GmbH, Germany)  
*Walter Nowak* (GPS Gesellschaft für Produktionssysteme GmbH, Germany)  
*Gerhard Kraetzschmar* (Bonn-Rhein-Sieg University of Applied Sciences, Germany)  
*Herman Bruyninckx* (Katholieke Universiteit Leuven, Belgium)  
*Peter Soetens* (Katholieke Universiteit Leuven, Belgium)  
*Martin Hägele* (Fraunhofer IPA, Germany)  
*Andreas Pott* (Fraunhofer IPA, Germany)  
*Peter Breedveld* (University of Twente, Netherlands)  
*Jan Broenink* (University of Twente, Netherlands)  
*Davide Brugali* (Università degli Studi di Bergamo, Italy)  
*Nicola Tomatis* (BlueBotics SA, Switzerland)

#### 4:35 **Innovative technologies for robot grippers**

*Andreas Wolf* (robomotion GmbH, Germany)

#### 4:55 **Virtual engineering & commissioning solutions for innovative robotized cells**

*René Kirsten* (ABB Automation GmbH, Germany)

## New Industrial Robot Applications

### Room: 5

*Chair: Rainer Bischoff* (KUKA Roboter GmbH, Germany)

#### 4:15 **Efficient production of green products**

*Martin Klinke* (ABB Automation GmbH, Germany)  
*Gunter Boerner* (ABB Automation GmbH, Germany)

#### 4:35 **Realization of Thermal Coating and Mechanical Compacting Processes based on industrial Multi Robot Systems**

*Alfred Hypki* (Technische Universität Dortmund, Germany)  
*Carsten Scheele* (Technische Universität Dortmund, Germany)  
*Bernd Kuhlenkötter* (TU Dortmund University, Industrial Robotics and Production Automation, Germany)

#### 4:55 **Development of Robots for the Pipeline Industry**

*Universidade Federal de Minas Gerais - Brazil, Brazil*  
*Alexandre Bracarense*  
*Frederico Ramalho Filho*  
*Eduardo Lima II*

#### 5:15 **Large-Scale Assembly of solar power plants with parallel cable robots**

*Andreas Pott* (Fraunhofer IPA, Germany)  
*Christian Meyer* (Fraunhofer IPA, Germany)  
*Alexander Verl* (Fraunhofer IPA, Germany)

## 7:30 PM – 11:00 PM

### Gala Dinner

## Wednesday, June 9, 2010

### 8:45 AM - 10:15 AM

## Service Robots 2

### Room: 2

*Chair: Christopher Parlitz* (SCHUNK GmbH & Co. KG, Germany)

#### 8:45 **Towards Bringing Robots into Homes**

*Markus Vincze* (Vienna University of Technology, Austria)  
*Walter Wohlkinger* (TU Wien, Austria)  
*Sven Olufs* (Vienna University of Technology, Austria)  
*Peter Einramhof* (Vienna University of Technology, Austria)  
*Robert Schwarz* (TU Wien, Austria)

#### 9:05 **Dynamic behaviour conception for Eml companion robot**

*Sebastien Saint-Aime* (University of Bretagne Sud, France)

- 9:25 Modeling a HexaPOD for Tumor Motion Compensation in Robot Assisted Radiotherapy**  
*Christian Herrmann* (University of Würzburg, Germany)  
*Lei Ma* (Southwest Jiaotong University, P.R. China)  
*Klaus Schilling* (University of Würzburg, Germany)
- 9:45 A new 3UPS1S spherical wrist for minimally invasive robotic surgery**  
*Jose Maria Sabater* (Miguel Hernandez University, Spain)  
*Nicolas Garcia-Aracil* (Miguel Hernandez University, Spain)  
*Carlos Perez* (Miguel Hernandez University, Spain)  
*Julio Mayol* (Hospital Clinico San Carlos, Spain)  
*Francisco Badesa* (Miguel Hernandez University, Spain)  
*Luis Maria Lopez* (Miguel Hernandez University, Spain)

### Biologically inspired Manipulation

- Room: 3**  
*Chair: Helge-Björn Kuntze* (Fraunhofer IOSB, Germany)
- 8:45 Group Dancing Mobile Flower Robots with Moving Mechanism, Mobility, and Localization Functions**  
*Jong-Oh Park* (Chonnam National University, Korea)
- 9:05 Multi-level Fuzzy-QFT Control of Conjugated Polymer Actuators**  
*Ferdowsi University of Mashhad, Iran*  
*Amir Ali Amiri Moghadam*  
*Ali Akbarzadeh Tootoonchi*
- 9:25 Time Efficient Hybrid Motion Planning Algorithm for HOAP-2 Humanoid Robot**  
*University of Hamburg, Germany*  
*Mohammed Elmogy*  
*Christopher Habel*  
*Jianwei Zhang*
- 9:45 Movement control in biologically plausible frames of reference**  
*Honda Research Institute Europe GmbH, Germany*  
*Michael Gienger*  
*Christian Goerick*  
*Edgar Körner*



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## Modeling and Simulation 1

### Room: 4a

*Chair: Bruno Siciliano* (Università di Napoli Federico II, Italy)

#### 8:45 **A Uniform Framework to Program, Animate and Control Objects, Kinematics and Articulated Mechanisms in a Comprehensive Simulation System**

*Jürgen Roßmann* (RWTH Aachen University, Germany)

*Kevin Eilers* (Dortmunder Initiative zur rechnerintegrierten Fertigung (RIF) e.V., Germany)

*Christian Schlette* (Institute of Man-Machine Interaction, RWTH Aachen University, Germany)

*Michael Schluse* (Institute of Man-Machine Interaction, RWTH Aachen University, Germany)

#### 9:05 **A Knowledge Integration Framework for Robotics**

Lund University, Sweden

*Jacob Persson*

*Axel Gallois*

*Anders Björkelund*

*Love Hafdel*

*Mathias Haage*

*Jacek Malec*

*Klas Nilsson*

*Pierre Nugues*

#### 9:25 **Robot Workcell Simulation with AutomationML Support - An Element of the CAX-Tool Chain in Industrial Automation**

*Adrian Schyja* (TU Dortmund University, Industrial Robotics and Production Automation (IRPA), Germany)

*Alfred Hypki* (Technische Universität Dortmund, Germany)

*Bernd Kuhlenkötter* (TU Dortmund University, Industrial Robotics and Production Automation, Germany)

#### 9:45 **Robot Program Validation using Virtualization, Components, and Physics Engines**

*WanLi Jiang* (ABB China Ltd, P.R. China)

*Steve Murphy* (ABB AB/Robotics, Sweden)

*Anders Ekelund* (ABB AB/Robotics, Sweden)

*Volker Miegel* (ABB Automation GmbH, Germany)

*XingGuo Yin* (ABB China Ltd, P.R. China)

*LiWei Qi* (ABB China Ltd, P.R. China)

## Micro and Nano Robotics

### Room: 5

*Chair: Jobst Bickendorf* (Autocam Informationstechnik GmbH, Germany)

#### 8:45 **Robots for Micro and Desktop Factories: Examples and Experiences**

Tampere University of Technology, Finland

*Timo Prusi*

*Asser Vuola*

*Riku Heikkilä*

*Niko Siltala*

*Reijo Tuokko*

#### 9:05 **Micro-/Nano-Integration for MEMS based on nano-robotic assembly**

*Thomas Wich* (University of Oldenburg, Germany)

*Sergej Fatikow* (University of Oldenburg, Germany)

#### 9:25 **Modeling and compensation of cutting-forces generated during the EDM process for ultra high-precision robots**

*Emanuele Lubrano* (Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland)

*Adrian Prodan* (EPFL, Switzerland)

*Reymond Clavel* (EPFL, Switzerland)

#### 9:45 **Analysis and Design of a Cable Driven Manipulator for Micro-Factory**

*Giovanni Legnani* (Università di Brescia, Italy)

*Irene Fassi* (ITIA-CNR National Research Council, Italy)

*Pierluigi Magnani* (Università di Brescia, Italy)

### 10:15 AM - 10:30 AM

Coffee Break

## 10:30 AM - 12:00 PM

### Service Robots 3

#### Room: 2

*Chair: Raymond Clavel* (EPFL, Switzerland)

#### 10:30 Making High-Tech Service Robot Platforms Available

*Florian Weisshardt* (Fraunhofer IPA, Germany)  
*Ulrich Reiser* (Fraunhofer IPA, Germany)  
*Christopher Parlitz* (SCHUNK GmbH & Co. KG, Germany)  
*Alexander Verl* (Fraunhofer IPA, Germany)

#### 10:50 Development of Safe Autonomous Mobile Service Robots using an Active Integrated Approach

*Holger Voos* (University Ravensburg-Weingarten, Germany)

#### 11:10 ModWall - a morphological boundary concept for pig stable design based on modular robotics

*Lars Dalgaard* (Danish Technological Institute, Denmark)  
*Bo Thomsen* (Danish Technological Institute, Denmark)

#### 11:30 Robotic Machine for High-Quality Shotcrete Process

*Samir Nabulsi* (Aitemin, Spain)  
*Angel Rodriguez* (Aitemin, Spain)  
*Olga Rio* (IETcc-CSIC, Spain)

### Biologically inspired Locomotion

#### Room: 3

*Chair: Frank Kirchner* (German Research Center for Artificial Intelligence (DFKI) GmbH, Bremen, Germany)

#### 10:30 An autonomous flying robot for testing bio-inspired navigation strategies

Humboldt University Berlin, Germany  
*Verena V Hafner*  
*Ferry Bachmann*  
*Oswald Berthold*  
*Michael Schulz*  
*Mathias Müller*

#### 10:50 A contribution to the amoeboid locomotion of mobile robots

*Klaus Zimmermann* (TU Ilmenau, Germany)  
*Valter Böhm* (TU Ilmenau, Germany)

### Biologically inspired Locomotion

#### 11:10 Fish-Inspired Swimming Simulation and Robotic Implementation

*Junzhi Yu* (University of Hamburg, Germany)  
*Jianwei Zhang* (University of Hamburg, Germany)

#### 11:30 A single actuated, modular swimming robot performing different styles of steady swimming species

Ilmenau University of Technology, Germany  
*Max Fremerey*  
*Lars Fischheiter*  
*Jörg Mämpel*  
*Hartmut Witte*

### Modeling and Simulation 2

#### Room: 4a

*Chair: Kristian Kroschel* (Universitaet Karlsruhe, Germany)

#### 10:30 Using ego motion feedback to improve the immersion in virtual reality environments

*Sebastian Noth* (Ruhr-Universität Bochum, Germany)  
*Eva Schrowangen* (FH-Gelsenkirchen, Germany)  
*Ioannis Iossifidis* (Ruhr-Universität Bochum, Germany)

#### 10:50 Model-Predictive Undercarriage Control for a Pseudo-Omnidirectional, Wheeled Mobile Robot

*Christian Connette* (Fraunhofer IPA, Germany)  
*Stefan Hofmeister* (University of Stuttgart, Germany)  
*Alexander Bubeck* (Fraunhofer IPA, Germany)  
*Martin Hägele* (Fraunhofer IPA, Germany)  
*Alexander Verl* (Fraunhofer IPA, Germany)

#### 11:10 Application of pseudo-elastic wire for hybrid cutting robotic tool

*Jawad Masood* (University of Genoa, Italy)

#### 11:30 Fusion of orientation data into a robot program using a hand-held digitizer stylus

*Hamza Shah* (University of Siegen, Germany)  
*Jürgen Wahrburg* (University of Siegen, Germany)

## Parallel Robots

### Room: 5

*Chair: Andreas Pott (Fraunhofer IPA, Germany)*

#### 10:30 **The Linear Delta: Developments and Applications**

*Mohamed Bouri (Ecole Polytechnique Federale de Lausanne, Switzerland)*

*Reymond Clavel (EPFL, Switzerland)*

#### 10:50 **Mathematical Modelling of 4 DOF Gantry Type Parallel Manipulator**

*Zoltán Forgó (Sapientia University, Romania)*

#### 11:10 **Development of Parallel Manipulators for Welding Robots**

*Universidade Federal de Minas Gerais - Brazil, Brazil*

*Eduardo Lima II*

*Frederico Ramalho Filho*

*Alexandre Bracarense*

#### 11:30 **A H-Scara Mini Robot – a Dual Parallel Kinematics Mini Manipulator**

*Tampere University of Technology, Finland*

*Niko Siitala*

*Asser Vuola*

*Riku Heikkilä*

*Reijo Tuokko*

### 12:00 PM - 1:00 PM

## Lunch Break

### 1:00 PM - 1:45 PM

## Invited Talk 3

### Room: 5

#### 1:00 **Field Robotics Driving Off-Road Equipment Productivity and Convenience**

*John Reid (John Deere, Germany)*

### 1:45 PM - 2:30 PM

## Invited Talk 4

### Room: 5

#### 1:45 **Better Place - next generation mobility. Herausforderungen und Chancen**

*Rolf Schumann (Better Place, USA)*

### 2:30 PM - 4:00 PM

## Service Robots 4

### Room: 2

*Chair: Florian Simons (SCHUNK GmbH & Co. KG, Germany)*

#### 2:30 **Towards an Intelligent Foot for Walking and Climbing Robots**

*Florian Cordes (DFKI GmbH, Germany)*

*Sebastian Bartsch (DFKI Bremen GmbH - Robotics Innovation Center, Germany)*

*Timo Birnschein (DFKI Bremen GmbH - Robotics Innovation Center, Germany)*

*Daniel Kühn (DFKI Bremen GmbH - Robotics Innovation Center, Germany)*

#### 2:50 **Design of a hybrid wheeled-legged robot - WheeHy**

*Bojan Jakimovski (University of Lübeck, Germany)*

*Martin Hörenz (Fachhochschule Lübeck, Germany)*

*Michael Kotke (University Lübeck, Germany)*

*Erik Maehle (University of Lübeck, Germany)*

## Service Robots 4 (continued from previous page)

- 3:10 Very Compact Climbing Robot rolling on Magnetic Hexagonal Cam-Discs, with High Mobility on Obstacles but Minimal Mechanical Complexity**  
*Fischer Wolfgang* (ETH Zürich, Switzerland)  
*Gilles Caprari* (ETH Zürich, Switzerland)  
*Siegwart Roland* (ETH Zurich, Switzerland)  
*Roland Moser* (ALSTOM Power Service, Switzerland)
- 3:30 Control of Meal-Assistance Robot Capable of Using Chopsticks**  
*Tomoki Koshizaki* (Tokai University, Japan)  
*Ryosuke Masuda* (Tokai University, Japan)

## Biologically inspired Exploration

### Room: 3

*Chair: Günter Hommel* (Technische Universität Berlin, Germany)

- 2:30 Kinematic motion analysis of the human arm during a manipulation task**  
*Andrea Maria Zanchettin* (Politecnico di Milano, Italy);  
*Paolo Rocco* (Politecnico di Milano, Italy);  
*Luca Bascetta* (Politecnico di Milano, Italy);  
*Ioannis Symeonidis* (Ludwig-Maximilians University, Germany);  
*Steffen Peldschus* (Ludwig-Maximilians-Universität München, Germany)
- 2:50 Using Different Adhesion Technologies in Modular Robot for Climbing**  
Ilmenau University of Technology, Germany  
*Jörg Mämpel*  
*Sebastian Köhring*  
*Hartmut Witte*  
*Cornelius Schilling*

### 3:10 SpaceClimber: Development of a Six-Legged Climbing Robot for Space Exploration

DFKI GmbH - Robotics Innovation Center, Germany

*Sebastian Bartsch*

*Timo Birnschein*

*Daniel Kühn*

*Peter Kampmann*

*Steffen Planthaber*

*Jens Hilljegerdes*

*Malte Römmermann*

*Florian Cordes* (DFKI GmbH, Germany);

*Frank Kirchner* (German Research Center for Artificial Intelligence (DFKI) GmbH, Bremen, Germany)

### 3:30 Excavation Mechanism for a Planetary Underground Explorer Robot

*Hayato Omori* (Chuo University, Japan)

*Taro Nakamura* (Chuo University, Japan)

## Modeling and Simulation 3

### Room: 4a

*Chair: Klas Nilsson* (Lund University, Sweden)

### 2:30 Integral modelling of objects for service robotic systems

*Henning Kampe* (University of Bremen, Germany)

*Axel Graeser* (University of Bremen, Germany)

### 2:50 Dynamic Modeling and Hardware-in-the-loop Simulation for the parallel cable robot IPAnema

*Philipp Miermeister* (Fraunhofer IPA, Germany)

*Andreas Pott* (Fraunhofer IPA, Germany)

*Alexander Verl* (Fraunhofer IPA, Germany)

### 3:10 Knowledge-Driven Opto-Acoustic Scene Analysis based on an Object-Oriented World Modelling Approach for Humanoid Robots

*Benjamin Kühn* (Karlsruhe Institute of Technology (KIT), Germany)

*Andrey Belkin* (Karlsruhe Institute of Technology (KIT), Germany)

*Alexej Swerdlow* (University of Karlsruhe, Germany)

*Timo Machmer* (University of Karlsruhe, Germany)

*Jürgen Beyerer* (Universität Karlsruhe (TH) / Fraunhofer IOSB, Germany)

*Kristian Kroschel* (Fraunhofer IOSB, Germany)

**3:30 Development of Simulation Software and Control System for Mechanism with Hybrid Kinematic Structure**

University of Zilina, Slovakia

*Viera Poppeova*

*Juraj Uričiek*

*Peter Šindler*

*Vladimír Bulej*

**Industrial Robot Applications**

**Room: 5**

*Chair: Bernd Kuhlenkötter* (TU Dortmund University, Industrial Robotics and Production Automation, Germany)

**2:30 3D Pendulum Swinging Control By An Industrial Robot Manipulator**

Karlsruhe Institute of Technology (KIT), Germany

*Wilhelm August*

*Thomas Haase*

*Björn Hein*

*Heinz Wörn*

*Jian Ren* (Universität Karlsruhe, Germany)

*Simon Notheis* (KIT, Germany)

**2:50 RANSAM for Industrial Bin-Picking**

Technical University of Braunschweig, Germany

*Dirk Buchholz*

*Simon Winkelbach*

*Friedrich M. Wahl*

**3:10 World's first arc welding robot with 7 controlled axes**

*Stefan Hagspiel* (MOTOMAN robotec GmbH, Germany)

**3:30 An intelligent assembly cell for automated cell production**

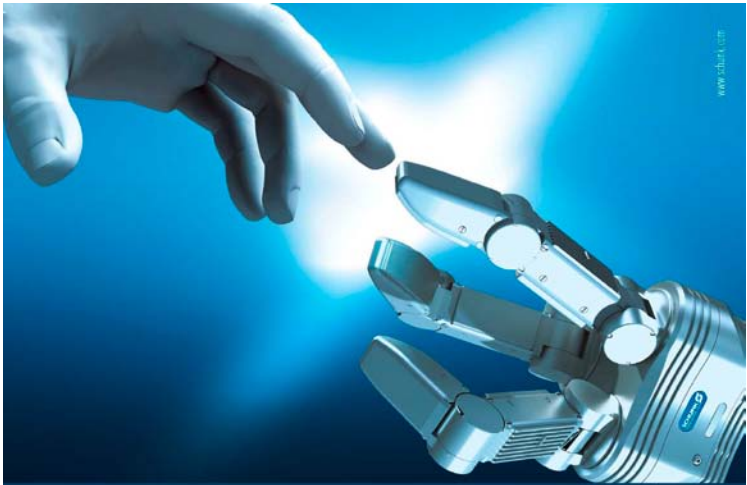
*Sumihisa Iwashita* (Mechanical Automation Group, Japan)

*Kanehara* (Yamatake Corporation, Japan)


*Hisashi Beppu* (Process Technology Group, Japan)

**4:00 PM - 4:30 PM**

Farewell




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# GALA DINNER

## IERA Award & Engelberger Award

**Tuesday, 8 June 2010, 7:30pm**

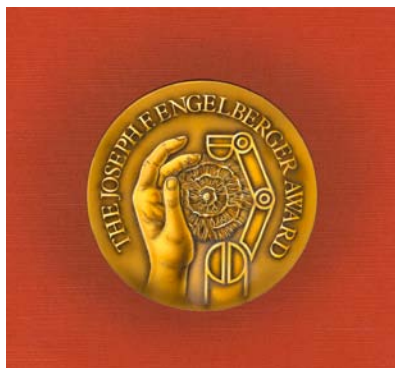
The Gala Dinner will take place in the famous Lenbach Palais in the city center of Munich.

During the Gala Dinner the IERA Award as well as the Joseph F. Engelberger Award ceremony will take place.

### IERA Award

The International Federation of Robotics (IFR) and the IEEE Robotics and Automation Society (IEEE RAS) jointly sponsor the Invention and Entrepreneurship Award. During the conference will be a special session on Tuesday morning, 8 June 2010, for chosen applicants to present their innovations. The application deadline for the IERA AWARD was 31 March 2010. See [www.isr-robotik-2010.com](http://www.isr-robotik-2010.com) for further details.

### 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.

Since places are limited we operate on a first come – first served basis.

Please consider when registering.

# GENERAL INFORMATION

## Secretariat

For detailed Information please contact:

### VDE-Conference Services

Ms Kristin Neumann  
Stresemannallee 15  
60596 Frankfurt  
Germany

Phone: +49-(0)69-63 08-275  
Fax: +49-(0)69-96 31-5213  
E-mail: [vde-conferences@vde.com](mailto:vde-conferences@vde.com)  
URL: [www.vde.com](http://www.vde.com)

## Web site

Visit the ISR/ROBOTIK 2010 homepage for getting the latest information related to the conference:

[www.isr-robotik-2010.com](http://www.isr-robotik-2010.com)

## Registration fees

	Before 14 May, 2010	From 14 May, 2010
Non-Member	EURO 750,-	EURO 820,-
Member (VDE/VDI, VDMA, DGR)	EURO 680,-	EURO 750,-
Speaker (1-2 papers)	EURO 350,-	EURO 420,-
Student (excluding Gala Dinner)	EURO 350,-	EURO 420,-
Day Registration (excluding Gala Dinner and CD ROM)	EURO 350,-	EURO 420,-
Gala Dinner Ticket (included, except Day and Student Registration)	sold out	sold out
Additional Gala Dinner Ticket	sold out	sold out
Optional Gala Dinner Ticket (only for IFR/VDMA invited)	sold out	sold out

- Participants applying for the membership fee must include a copy of their membership card to the registration form. VDMA and DGR members please mention the according membership on the registration form.
- For Student Registration a copy of the Student ID has to be included.
- The Speaker fee of EURO 350,- is only for one author and up to two papers. Additional papers cost extra.
- Presenting authors, co-authors, committee members and session chairs are not exempt from paying registration fees.

### Conference Registration

Includes admission to all sessions and to the daily luncheons, welcome reception on Monday 7 June, one AUTOMATICA fair ticket and one copy of the proceedings as CD-ROM.

### Gala Dinner

The Gala Dinner is included in the conference fee except for Student and Day Registration. Since places are limited we operate on a first come – first served basis. Please consider when registering.

## Registration

To register for ISR/ROBOTIK 2010 please fill in the registration form attached to this program and return it to VDE-Conference Services. You can also register online at [www.isr-robotik-2010.com](http://www.isr-robotik-2010.com). To enjoy the „early-bird-discount“, VDE Conference Services must receive the form before 14 May 2010. Credit card information must accompany all registrations in order to be accepted.

**Please visit <http://www.isr-robotik-2010.com> if you prefer online registration.**

The name badge as well as the AUTOMATICA fair ticket will be handed over to you at the conference registration desk open from 7 - 9 June 2010.

## Payment

Payment for registration, including bank charges and processing fees, must be made in Euro.

The conference fee has to be fully paid in advance. **Confirmation of registration will be sent after full payment has been received at the VDE-Conference Services.**

The following methods of payment are accepted:

- By credit card authorisation as per registration form. The 16 digit card number, expiry date, security No. (last 3 digits on rear side of credit card) and holder's name must be indicated on the registration form. Signature of the card holder is mandatory.
- By cheque in EURO (€) payable to VDE and send together with the registration form by mail.
- Cash payment on-site in EURO (€)

## Cancellation

In case of cancellation, provided that written notice is received at the VDE-Conference Services before 6 May 2010 the registration fee will be fully refunded less a handling fee of EURO 60,-. After May 06, 2010 no refund will be made. The CD-ROM will be sent to the registrant after the conference.

## Proceedings

All papers accepted for presentation at the conference will be published as CD-ROM. The CD-ROM will be handed on-site to all delegates attending the event.

Additional CD-ROM's are on sale during the conference (upon availability) at Euro 60,-

## Hotel reservation / Official Travel Agency

For room reservation we work together with trade fair AUTOMATICA. Please check our website [www.isr-robotik-2010.com](http://www.isr-robotik-2010.com), Accommodation.

You can also contact directly the following agency:

### **Munich Tourist Office**

Sendlinger Straße 1

80331 München

Tel.: +49 (0) 89 233 96 555

E-Mail: [hotelservice@muenchen.de](mailto:hotelservice@muenchen.de)

For detailed information on hotel reservations please visit also [www.muenchen.de/tourismus](http://www.muenchen.de/tourismus)

At the same time of ISR/ROBOTIK 2010, the trade fair AUTOMATICA as well as other events will take place in Munich. **Therefore we highly recommend to book your room as early as possible.**

## Munich and the Conference Venue

Munich, the capital of Bavaria, is one of Germany's most exciting travel destinations and offers variety for every visitor. The lively city consists of a mixture of visible history of almost one thousand years and modern spirit. Please visit the official website at [www.munich.de](http://www.munich.de) for further information.

### **The ISR/ROBOTIK 2010 will take place in the ICM (International Congress Centre Munich)**

The ICM is connected to the New Munich Trade Fair Centre where the fair Automatica will take place.

ICM – International Congress Centre Munich

Messegelaende

Entrance West

81823 Munich

Tel.: +49 89 949 230 23

E-Mail: [info@icm-muenchen.de](mailto:info@icm-muenchen.de)

## Insurance

The organisers may not be held responsible for any injury to participants or damage, theft and loss of personal belongings. Participants should therefore make their own insurance arrangements.

## Passport and Visa Requirements

Foreign visitors entering Germany have to present a valid Identity Card or Passport. Delegates who need a visa should contact the German consular offices or embassies in their home countries. Please note that neither the VDE-Conference Services nor the supporting bodies are able to extend any „**Invitation**“ for application of visa.

## Confirmation Letter for Visa

All participants who need a Visa Confirmation Letter are requested to send an email providing the information below to [vde-conferences@vde.com](mailto:vde-conferences@vde.com) with subject **ROBOTIK - VISA LETTER**. Please be aware that Confirmation Letters will only be send after full registration and payment have been made.

Full Name

Company

Date of Birth

Passport No.

Date of Issue

Date of Expiry

Place of Issue

## Currency

The official currency in Germany is the Euro (€). Usual credit cards (Mastercard, American Express, VISA) are accepted in hotels, department stores and restaurants.

## Registration hours on-site

The registration desk on-site will be open available at hall B0, entrance West

Monday, June 7, 2010, 09:00 AM to 5:30 PM

Tuesday, June 8, 2010, 08:00 AM to 5:45 PM

Wednesday, June 9, 2010, 08:00 AM to 4:00 PM

Availability by phone or e-mail on-site

Registration counter:

Phone: +49-(0)89 949 33 750

E-mail: [vde-conferences@vde.com](mailto:vde-conferences@vde.com)

## Official Language

The official conference language is English. All sessions will be held in English, only.

## Transport

The ICM (International Conference Centre Munich) is situated directly next to the A 94 motorway. A dynamic traffic routing system shows you the way.

### By train:

From the main train station take the subway U2 direction "Messestadt Ost". Get off at Messestadt West and go to entrance West.

### By plane:

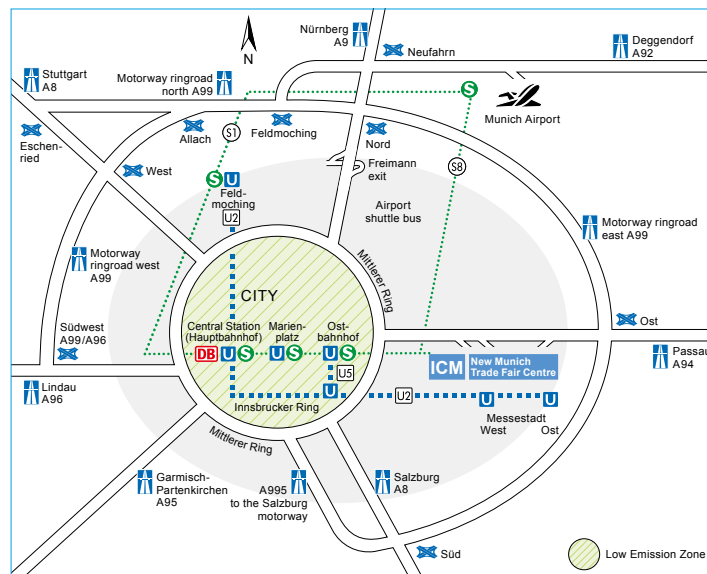
Munich airport is located 28 km north east of Munich. The ICM (International Congress Centre) can be reached per shuttle bus, taxi or public transport from the airport.

## Social Program

- The Gala Dinner will take place on June 8, 2010, 7:30pm in the Lenbach Palais.

The attendance is included in the full conference fee (except Student and Day Registration). Additional tickets may be ordered with the registration form. Since places are limited we operate on a first come - first served basis.

## How to get to the New Munich Trade Fair Centre/ICM



### By car

- Follow the trade fair signs; there is plenty of parking.
- Direct link with the A94 to Passau or Munich, exit München-Riem or Feldkirchen-West.
- Approx. 35-minute drive from Munich Airport.

### By U-Bahn

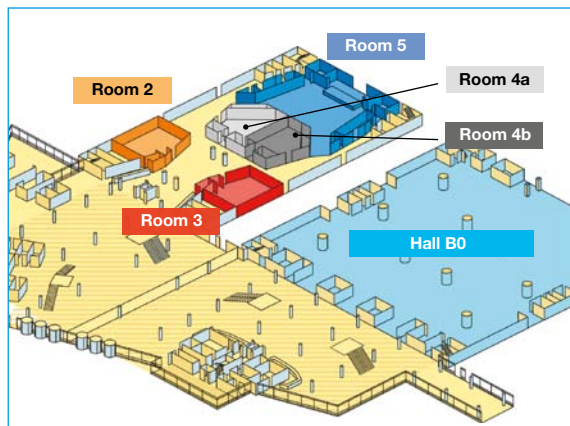
- Underground U2 to Messestadt West or Messestadt Ost station.

### By plane

- S1/U2: S1 from the airport to Feldmoching station or Munich Central Station (Hauptbahnhof). Change to underground U2 which takes you directly to the trade fair grounds – Messestadt West and Messestadt Ost.
- S8/U2: S8 from the airport to Munich Central Station / Hauptbahnhof. Change to underground U2 which takes you directly to the trade fair grounds – Messestadt West and Messestadt Ost.

# Monday, 7.6.2010

	Room 2	Room 3	Room 4a	Room 5
9:45-10:00				Welcome
10:00-11:30	Tactile and Acoustic Sensing	Localization and Mapping 1	Learning and Adaptation	Human-Robot Collaboration
11:30-11:45	Coffee Break in Hall B0			
11:45-12:30				Invited Talk 1
12:30-1:30	Lunch Break in Hall B0			
1:30-3:00	3D Vision 1	Localization and Mapping 2	Industrial Human-Robot Cooperation	Motion Planning
3:00-4:00	Poster Session 1 and Coffee Break in Hall B0			
4:00-5:30	3D Vision 2	Localization and Mapping 3	Personal Human-Robot Cooperation	Robot Control of Machining Processes
5:30	Welcome Reception			



# Tuesday, 8.6.2010

	Room 2	Room 3	Room 4a	Room 4b	Room 5
8:45-10:15	Applications for Vision Sensors	Path Planning and Navigation 1	Industrial Grasping Applications	IERA Session 1	Force Torque Control
10:15-10:30	Coffee Break in Hall B0				
10:30-12:00	Safety Applications	Path Planning and Navigation 2	Anthropomorphic Arms and Hands	IERA Session 2	Simulation and Programming
12:00-1:00	Lunch Break in Hall B0				
1:00-1:45					Invited Talk 2
1:45-3:15	Exploration and Perception	Humanoid Robotics 1	Vision-based Manipulation	Invited Industrial Session 1	Industrial Robot Modeling
3:15-4:15	Poster Session 2 and Coffee Break in Hall B0				
4:15-5:45	Service Robots 1	Humanoid Robotics 2	New Manipulation Technologies	Invited Industrial Session 2	New Industrial Robot Applications
7:30	Gala Dinner at the Lenbach Palais				

# Wednesday, 9.6.2010

	Room 2	Room 3	Room 4a	Room 5
8:45-10:15	Service Robots 2	Biologically inspired Manipulation	Modeling and Simulation 1	Micro and Nano Robotics
10:15-10:30	Coffee Break in Hall B0			
10:30-12:00	Service Robots 3	Biologically inspired Locomotion	Modeling and Simulation 2	Parallel Robots
12:00-1:00	Lunch Break in Hall B0			
1:00-1:45				Invited Talk 3
1:45-2:30				Invited Talk 4
2:30-4:00	Service Robots 4	Biologically inspired Exploration	Modeling and Simulation 3	Industrial Robot Applications
4:00-4:30	Farewell			

# Contact

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