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
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)
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)
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(ISR 2010)

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- Friedrich Wahl, Technische Universität Braunschweig
- 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

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

“Better Place – next generation mobility. Herausforderungen und Chancen”
Country Engagement Principal Europe, Better Place, Germany
Location ICM

Farbcode

Room 2
Room 3
Room 4a
Room 4b
Room 5
Hall B0
Monday, June 7, 2010

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

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 Luttemann
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)

**10:00 AM - 11:30 AM  Tactile and Acoustic Sensing**

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)

**10:00 AM - 11:30 AM  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); Ioannisiosis (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 Universitaet Muenchen, 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 IVP AB, Sweden)
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

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)

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 Wuerzburg, 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 Reinhart (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
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<td>Levente Tamas, Technical University of Cluj-Napoca, Romania</td>
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<td>Experimental Evaluation of a Low-cost Mobile Robot Localization Technique for Large Indoor Public Environments</td>
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<td>New Approach in Solving the Kidnapped Robot Problem</td>
<td>Technical University of Cluj-Napoca, Romania, Andras Majdik, Mircea Popa, Levente Tamas, Istvan Szoke, Gheorghe Lazea</td>
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**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, Hemesoo 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)

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

5:00 Robot Machining with additional 3D-Piezo-Actuation Mechanism for Error Compensation
Fraunhofer IPA, Germany
Arnold Puzik
Christian Meyer
Alexander Verl

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

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 Wörm (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)
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)
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 Bücker
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)

On the control problem of a hyper-redundant arm
University of Craiova, Romania
Mircea Ivanescu
Mihaela Florescu
University Politehnica of Bucharest, Romania
Nirvna Popescu
Decebal Popescu

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

11:00 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

10:30 Grasp synthesis for dextrous hands optimised for tactile manipulation
University of Southern Denmark, Denmark
Jimmy Jørgensen
Henrik Petersen

11:00 Development of a Multi-fingered Robot Hand with Softness-changeable Skin Mechanism
Hiroki Takeuchi (Kanazawa University, Japan)
Watanabe (Kanazawa University, Japan)

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

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)
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
1:45  Robotic Analysis of Everyday Scenes
Gisbert Lawitzky (Siemens AG, Germany)

Room: 3
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

Humanoid Robotics 1
Room: 3
Chair: Ruediger Dillmann (Karlsruhe Institute of Technology (KIT), Germany)

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)

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 Petereit
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)

2:25  Multi-Sensor Fusion for Localization of a Mobile Robot in Outdoor Environments
Thomas Emter (Fraunhofer IOSB, Germany)
Arda Salto lu (Fraunhofer IOSB, Turkey)
Janko Petereit (Fraunhofer IOSB, 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

2:45  Visual Odometry Using Feature Point and Ground Plane for Urban Environments
Atsushi Sakai (Meiji University, Japan)

2:45  Online Road Surface Analysis using Laser Remission in Structured Outdoor Environments
Teppei Saitoh (Meiji University, Japan)
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 Koeppke
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 Universität München, 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 Bayhammer (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)
Industrial Robot Modeling (continued from previous page)

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 „ROTTO“: Design, Simulation, Experiments
Mykhaylo Koniev (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)

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 Matsuhiro (Toshiba Corporation, Japan)
Seiji Tokura (Toshiba Corporation, Japan)
Takahumi 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)
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 Chaillot (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 Breevdeld (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 EmI 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)

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**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*
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 Hafdell
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)

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: Reymond Clavel (EPFL, Switzerland)

10:30 Making High-Tech Service Robot Platforms Available
   Florian Weisshardt (Fraunhofer IPA, Germany)
   Ulrich Reiser (Fraunhofer IPA, Germany)
   Christopher Parritz (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)

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 Siltala
        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)
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 Peidschus (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 Beyeler (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 Uriček
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 Wörm
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
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 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
Stresemannalleee 15
60596 Frankfurt
Germany

Phone: +49-(0)69-63 08-275
Fax: +49-(0)69-96 31-5213
E-mail: vde-conferences@vde.com
URL: 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
Registration fees

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

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, 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

For detailed information on hotel reservations please visit also 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 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

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 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

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

<table>
<thead>
<tr>
<th>Time</th>
<th>Room 2</th>
<th>Room 3</th>
<th>Room 4a</th>
<th>Room 5</th>
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<tbody>
<tr>
<td>9:45-10:00</td>
<td>Welcome</td>
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<tr>
<td>10:00-11:30</td>
<td>Tactile and Acoustic Sensing</td>
<td>Localization and Mapping 1</td>
<td>Learning and Adaptation</td>
<td>Human-Robot Collaboration</td>
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<tr>
<td>11:30-11:45</td>
<td>Coffee Break in Hall B0</td>
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<tr>
<td>11:45-12:30</td>
<td>Invited Talk 1</td>
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<td>12:30-1:30</td>
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<tr>
<td>1:30-3:00</td>
<td>3D Vision 1</td>
<td>Localization and Mapping 2</td>
<td>Industrial Human-Robot Cooperation</td>
<td>Motion Planning</td>
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<tr>
<td>3:00-4:00</td>
<td>Poster Session 1 and Coffee Break in Hall B0</td>
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<td>Personal Human-Robot Cooperation</td>
<td>Robot Control of Machining Processes</td>
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<tr>
<td>4:00-5:30</td>
<td>3D Vision 2</td>
<td>Localization and Mapping 3</td>
<td>Personal Human-Robot Cooperation</td>
<td>Robot Control of Machining Processes</td>
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<td>5:30</td>
<td>Welcome Reception</td>
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### Tuesday, 8.6.2010

<table>
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<th>Room 4b</th>
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<tbody>
<tr>
<td>8:45-10:15</td>
<td>Applications for Vision Sensors</td>
<td>Path Planning and Navigation 1</td>
<td>Industrial Grasping Applications</td>
<td>IERA Session 1</td>
<td>Force Torque Control</td>
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<tr>
<td>10:15-10:30</td>
<td>Coffee Break in Hall B0</td>
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<tr>
<td>10:30-12:00</td>
<td>Safety Applications</td>
<td>Path Planning and Navigation 2</td>
<td>Anthropomorphic Arms and Hands</td>
<td>IERA Session 2</td>
<td>Simulation and Programming</td>
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<td>12:00-1:00</td>
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<td>1:00-1:45</td>
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<td>1:45-3:15</td>
<td>Exploration and Perception</td>
<td>Humanoïd Robotics 1</td>
<td>Vision-based Manipulation</td>
<td>Invited Industrial Session 1</td>
<td>Industrial Robot Modeling</td>
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<td>3:15-4:15</td>
<td>Poster Session 2 and Coffee Break in Hall B0</td>
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<td>New Manipulation Technologies</td>
<td>Invited Industrial Session 2</td>
<td>New Industrial Robot Applications</td>
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<tr>
<td>4:15-5:45</td>
<td>Service Robots 1</td>
<td>Humanoïd Robotics 2</td>
<td>New Industrial Robot Applications</td>
<td>New Industrial Robot Applications</td>
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<td>7:30</td>
<td>Gala Dinner at the Lenbach Palais</td>
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### Wednesday, 9.6.2010

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<tr>
<td>8:45-10:15</td>
<td>Service Robots 2</td>
<td>Biologically inspired Manipula-</td>
<td>Modeling and Simulation 1</td>
<td>Micro and Nano Robotics</td>
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<td>10:30-12:00</td>
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<td>Biologically inspired Locomo-</td>
<td>Modeling and Simulation 2</td>
<td>Parallel Robots</td>
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<tr>
<td>1:00-1:45</td>
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<tr>
<td>1:45-2:30</td>
<td>Invited Talk 4</td>
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<tr>
<td>2:30-4:00</td>
<td>Service Robots 4</td>
<td>Biologically inspired Explora-</td>
<td>Modeling and Simulation 3</td>
<td>Industrial Robot Applications</td>
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<tr>
<td>4:00-4:30</td>
<td>Farewell</td>
<td></td>
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</table>

**Room Map**

- Room 2
- Room 3
- Room 4a
- Room 4b
- Room 5
- Hall B0
Any inquiries relating to ISR/ROBOTIK 2010 should be sent to:

VDE Conference Services
ISR/ROBOTIK 2010
Stresemannallee 15
60596 Frankfurt am Main
Germany

Mrs. Kristin Neumann
Tel.: +49/ (0)69/6308-275
Fax: +49/ (0)69/96315213
vde-conferences@vde.com