



Fraunhofer

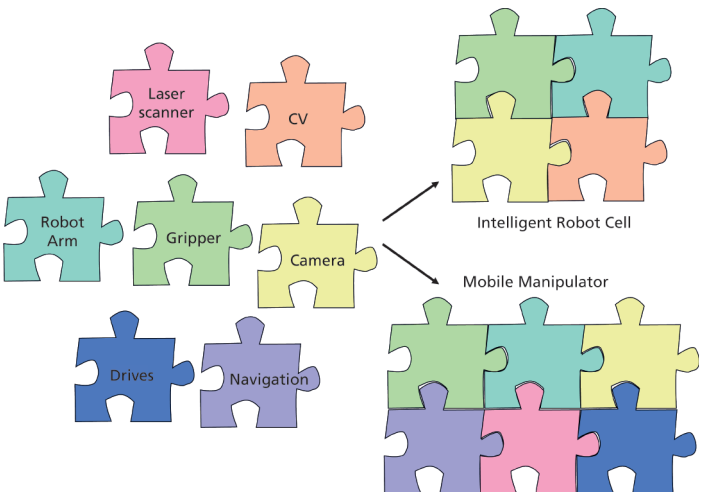
IPA

FRAUNHOFER-INSTITUTE FOR
MANUFACTURING ENGINEERING AND AUTOMATION IPA

CONFERENCE, OCTOBER 17, 2012

ROS INDUSTRIAL – AN ENABLER FOR INDUSTRIAL ROBOTICS?

DEVELOPMENT OF INDUSTRIAL APPLICATIONS WITH ROS –
EXPERIENCES



PREFACE

The integration of hardware and software components into new automation applications is still a big challenge regarding interface adaptations, communication, conduction of components and integration tests as well as optimization of parameters for the target scenario. In addition, applications in the automation domain are often developed from scratch with only limited software reuse.

Using component-based development in combination with reuse of existing software and hardware components promises a significant improvement in efficiency for application development.

A prominent example for a widely used component-based framework is ROS, which focuses on code reuse in robotics research and development and offers already great variety of mature robotic software components (e.g. SLAM, motion planning, 2D/3D perception).

In this conference methods and procedures for the component-based development with ROS are presented that increase the reusability of existing components. Furthermore, the ROS Industrial initiative is introduced that matches existing ROS components to the needs of industrial applications (e.g. quality assurance, robustness, etc.). Concrete examples how ROS is already used in industrial applications today are given in the conference.

We are looking forward to welcome you at Fraunhofer IPA at our conference.

September 2012

Directors



Prof. Dr.-Ing. Dr. h. c. Alexander Verl



Prof. Dr.-Ing. Thomas Bauernhansl

THE EVENT AT A GLANCE

OBJECTIVES

In this conference we want to bring together representatives from academia and industry to exchange experiences on application development with ROS and clarify the needs of industry with respect to ROS Industrial. The participants have the opportunity to get information on the starting initiative of ROS Industrial and generate and influence the goals, timelines and development priorities of the community development.

Conference Topics:

- Presentation of methods and procedures of component-based development with ROS
- Introduction of the ROS Industrial initiative
- Examples of successful technology transfer from academia to industrial applications
- ROS for product development

TARGET AUDIENCE

This conference addresses developers of industrial robotic applications, system integrators and executive personal of small and medium-sized enterprises as well as R&D division of larger companies in the field of automation, logistics and production.

PROGRAMME

WEDNESDAY, OCTOBER 17 2012

SESSION CHAIR: ULRICH REISER

ab

8.30 Coffee Break

9.00 Alexander Verl, Fraunhofer IPA

Welcome and Introduction

9.15 Shaun Edwards, Southwest Research Institute

ROS Industrial – Open Software Components for Industrial Automation

- Overview of the open source Robot Operating System
- Open software components for industrial automation
- The ROS Industrial Consortium, commercial support for an open source solution

10.15 Alexander Bubeck, Fraunhofer IPA

Model driven engineering: A Way to Handle Complexity, Quality and Processes in component based Robot Systems

- Introduction to model driven engineering (MDE)
- Application of process and component models to ROS
- Development of ROS systems with the BRICS IDE, an Eclipse based MDE-toolchain

10.45 Coffee Break

11.15 Christopher Parlitz, Schunk GmbH & Co. KG

Industrial Gripping Technology and Components for mobile Production Assistants

- Components of mobile manipulation
- Robotics as "science of integration"
- Example applications
- ROS as possible enabler

PROGRAMME

WEDNESDAY, OCTOBER 17 2012

SESSION CHAIR: ULRICH REISER

- 11.45 Florian Weißhardt, Fraunhofer IPA
Accelerating Technology Transfer through Open Source Components
- Existing open source components
 - Description of application and hardware components
 - Experiences on system integration und application development
- 12.15 Lunch
- 13.15 **Lab Tour at the Fraunhofer IPA facilities**
- 14.00 Benjamin Pitzer, Robert Bosch LLC, USA
ROS for Product Development
- ROS – A platform for academic research only?
 - Analysis of ROS quality of code compared to code developed according to industrial standards
 - Customization of ROS to industrial computation architectures
- 14.30 Cristina Cristalli, Loccioni Group
New Challenges for Mobile Service Robots conceived to Work in Industrial Environments
- Service and industrial robotics: two different worlds?
 - Application case: Mo.Di.Bot: Mobile Diagnostic Robot
 - Hardware setup, software architecture and system capabilities
 - Validation in real-world scenarios
- 15.00 Robert Eidenberger, Siemens AG
Developing Industrial Applications with ROS
- Robotics at Siemens Corporate Technology: A survey and application examples
 - The Active Perception Framework and the impact of ROS
 - Key requirements of ROS towards industrial applications

PROGRAMME

WEDNESDAY, OCTOBER 17 2012

SESSION CHAIR: ULRICH REISER

15.30 Coffee Break

16.00 Erik Nieves, Yaskawa Motoman Robotics
Why Industrial Robot Manufacturers Should Care about ROS

- ROS speeds time to market by acting as a force multiplier for development
- The implications of ROS for peripherals and associated technologies
- ROS Industrial as an enabler for wide adoption

16.30 Kurt Nielsen, Danish Institute of Technology
How to Work with Innovation, Automation and Research when being a Manufacturing Company?

- How to select and implement strategic automation solutions
- Project examples (videos)

17.00 **Final Discussion**

ca.

17.30 End of Conference

GENERAL CHAIR AND SPEAKERS

GENERAL CHAIR

Prof. Dr.-Ing. Dr. h. c. Alexander Verl

Director of Fraunhofer IPA

Fraunhofer-Institut für Produktionstechnik und
Automatisierung IPA, Stuttgart

SESSION CHAIR

Dipl.-Ing. Ulrich Reiser

Group Manager Software Engineering und Systemintegration

Fraunhofer-Institut für Produktionstechnik und
Automatisierung IPA, Stuttgart

SPEAKERS

Dipl.-Ing. Alexander Bubeck

Project Manager

Fraunhofer-Institut für Produktionstechnik und
Automatisierung IPA, Stuttgart

Cristina Cristalli Ph. D.

Research for Innovation Manager

Loccioni Group, Italy

Shaun Edwards

Manufacturing System Department

Southwest Research Institute, Texas, USA

Dr. Robert Eidenberger

Corporate Research and Technologies

Siemens AG, München

SPEAKERS

Kurt Nielsen M. Sc.

Team leader Robot Technology
Danish Technological Institute, Odense, DK

Erik Nieves

Technology Director
Yaskawa Motoman Robotics, USA

Dipl.-Math. (FH) Christopher Parlitz M. Sc.

Product Specialist Mobile Gripping Systems
SCHUNK GmbH & Co. KG, Lauffen/Neckar

Dr.-Ing. Benjamin Pitzer

Senior Research Engineer
Autonomous Technologies Group
Robert Bosch LLC, Palo Alto, California, USA

Dipl.-Ing. Florian Weißhardt

Project Manager ROS Industrial
Fraunhofer-Institut für Produktionstechnik und
Automatisierung IPA, Stuttgart

GENERAL INFORMATION

INFORMATION AND REGISTRATION

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c/o Fraunhofer IPA
Frau Karin Reinert
Nobelstrasse 12 | 70569 Stuttgart | Germany
Phone +49 711 970-1204 | Fax -1877
karin.reinert@ipa.fraunhofer.de

ORGANIZATION

Verein zur Förderung produktionstechnischer Forschung e. V. (FpF),
Stuttgart

CONFERENCE FEE

The conference fee is Euro **500,-** per person.
This fee includes the participation in all presentations, conference documents with the presentation material, lunch and refreshments during the conference.

REGISTRATION

We request online registrations to the participation with informal mail containing the participant's name, address and possibly deviating invoice address. After the registration, the invoice and further information will be sent to you if necessary.

The deadline for registration is Thursday, October 4, 2012.

CHANGE OF REGISTRATION

A change of registration to another participant is possible. Please inform the conference office about the alternate participant. This service is possible at any time and free of charge.

CANCELLATION OF REGISTRATION

For cancellations until 10 days before the conference we have to charge Euro 100. After this date the full participation fee is charged.

GENERAL INFORMATION

ACCOMMODATION IN STUTT GART

Regio Stuttgart Marketing- und Tourismus GmbH

Phone +49 711 2228-233/-246 | Fax -251

www.stuttgart-tourist.de/DEU/suchen_buchen/uebernachtung.htm

Near our institute we recommend:

Relaxa Waldhotel Schatten

Magstadter Strasse, 70569 Stuttgart

Phone +49 711 6867-0 | Fax -999

Stuttgart@relaxa-hotel.de | www.relaxa-hotels.de

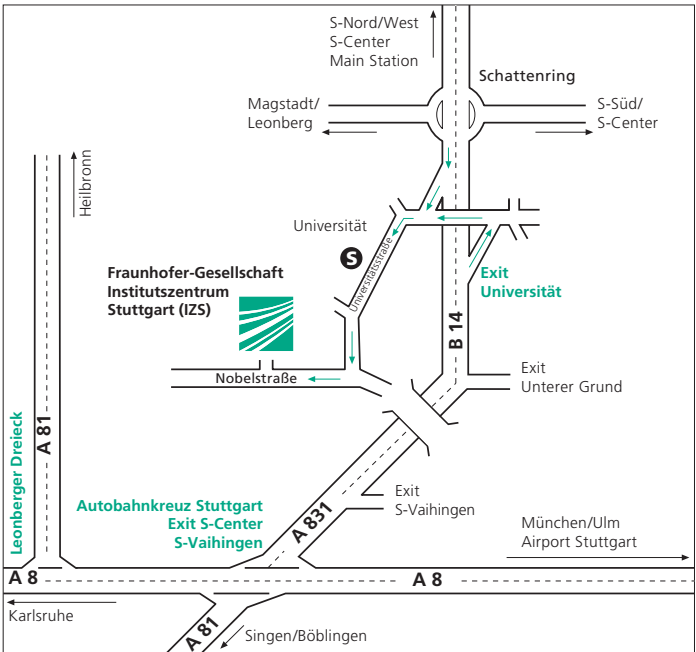
Please ask for special Fraunhofer rates.

HOW TO FIND US

Fraunhofer-Institute for Manufacturing Engineering and

Automation IPA | Institute Center Stuttgart (IZS)

Nobelstrasse 12 | 70569 Stuttgart (Vaihingen) | Germany



REGISTRATION

Please send back via Fax +49 711 970-1877

**Verein zur Förderung produktions-
technischer Forschung e. V. (FpF)**

c/o Fraunhofer IPA

Frau Karin Reinert

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70569 STUTTGART | GERMANY



Fraunhofer

IPA

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OCTOBER 17, 2012**

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ROS INDUSTRIAL – AN ENABLER FOR INDUSTRIAL ROBOTICS?

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Name

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Vorname

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Titel

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Firma

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Abteilung

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Postfach/Straße

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PLZ/Ort

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Telefon/Fax

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E-Mail

REGISTRATION:

Register for the Fraunhofer IPA Conference
(Organisation Committee FpF)

ROS INDUSTRIAL – AN ENABLER FOR INDUSTRIAL ROBOTICS?

October 17, 2012
Conference Fee € 500,–

Please pay after having received the invoice and confirmation of registration

Note: According to § 26.1 German Federal Data Security Law we inform you that we will store
your address in a computer file

I acknowledge the terms and conditions indicated for registration in this brochure.

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Place/ Date

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Signature