NEWSLETTER DFKI

2/2009

▶ RESEARCH LABS

IMAGE UNDERSTANDING AND PATTERN RECOGNITION

KNOWLEDGE MANAGEMENT

ROBOTICS INNOVATION CENTER

SAFE AND SECURE COGNITIVE SYSTEMS

INNOVATIVE RETAIL LABORATORY

INSTITUTE FOR INFORMATION SYSTEMS

AGENTS AND SIMULATED REALITY

AUGMENTED VISION

LANGUAGE TECHNOLOGY

INTELLIGENT USER INTERFACES

INNOVATIVE FACTORY SYSTEMS

Photo-realistic visualization

Tag der Deutschen Einheit Saarland 2009

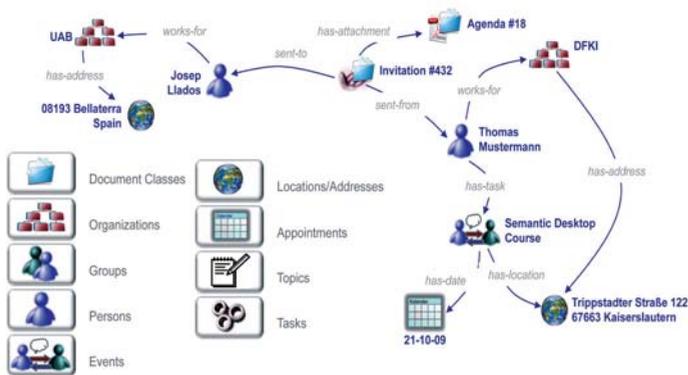## Day of German Unity in Saarbrücken

Groundbreaking for DFKI Visualization Center

Germany and China – Moving Ahead Together
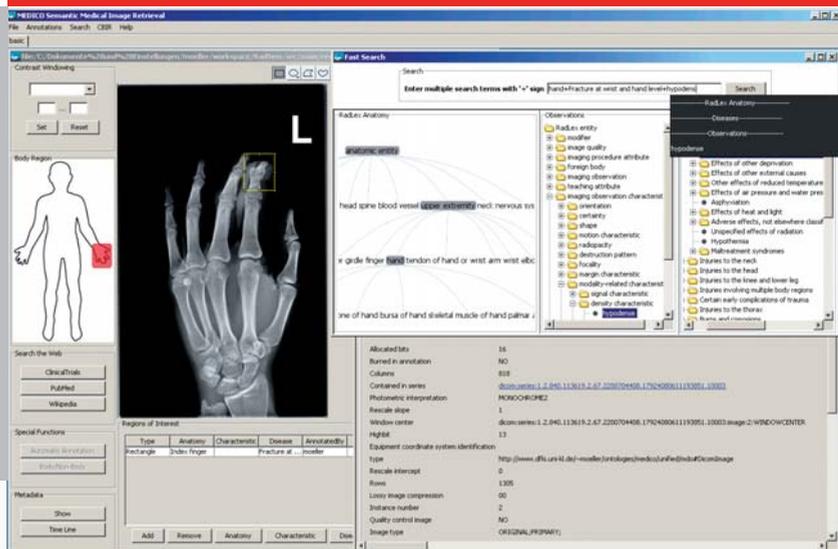
DFKI Innovation Fair
„Semantic Technologies"

Intelligent semantic applications for manufacturers, service providers and public administration

Focus on Semantics

Within the frame of system presentations and expert discussions, we will inform you about approved solutions and current developments in the application of semantic technologies in the areas of Storage & Retrieval, Searching, Knowledge Management, Speech & Language Technologies and Process Modeling. The planned schedule opens up plenty of opportunities for personal talks.

Intelligent Information Extraction   Semantic Networks

Semantics at Home   Semantic Desktop   Adaptive Assistance

Semantic Product Memory

Semantic Full-Text Search   Multi-Modal Access to Large Data Volumes

Innovation Monitoring   Case-Based Reasoning   Semantic Navigation of Document Repositories

TAKE – Semantic Full-Text Search in PDF Documents   Touch&Write   Penabled Interactive Semantic Touchtable

Annotation and Search for Medical Images   Semantic Wikis

Semantic Technologies in Machine Translation

November 5, 2009

09:00 - 17:30

DFKI Kaiserslautern
Trippstadter Straße 122
D-67663 Kaiserslautern

The participation is free.
Please register tentatively
innovationsmesse@dfki.de

More information
www.dfki.de/web/news/innovationfair_2009

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Program

Time	Event
08:00 - 09:00	Registration
09:00 - 09:30	Greeting by Prof. Dr. Andreas Dengel
09:30 - 10:30	Short introduction to the exhibits
10:30 - 15:00	Demonstrations and expert talks
12:30 - 14:00	Lunch buffet at the Sky Lounge
15:00 - 16:00	Meet the Expert – one-to-one talks
16:00 - 16:30	Summing-up by Prof. Dr. Andreas Dengel
16:30 - 17:30	Get together

Groundbreaking for DFKI Visualization Center

New lab space for groundbreaking scientific research, innovative ideas, additional jobs, and international cooperation – all this is being created by DFKI with the Visualization Center, the second DFKI expansion project on the campus of the Saarland University. The new Visualization Center is being built to provide 1102 square meters of primary work area at a total cost of € 4.6 million. The construction is scheduled for completion by the end of June 2010.

At the groundbreaking ceremony on August 13, 2009, Prof. Wolfgang Wahlster described the role of the new Visualization Center: "DFKI is a key research and innovation partner in the consortium EIT ICT Labs, and future plans call for it to become a part of the elite European Institute of Technology (EIT). This is where, together with other top institutes like the French INRIA, the foundation for the Internet of the Future will be defined. The DFKI Visualization Center is a player in the first league of 3D-internet development!"

Photo: Iris Maurer

Magic telescope: Prof. Wahlster looks into the future

"The new building is an additional confirmation of the potential of the Saarland University and an acknowledgement of its reputation in the scientific community" said Prof. Volker Linneweber, President of the University. "This is very important for the students, as they have a wider opportunity to gain practical experience during their studies by working on projects in the industry – it promotes a favorable image of the location to the outside and helps to create national and international recognition."

A significant portion of the new building is intended as a showroom for the 3D visualizations of the DFKI Department Agents and Simulated Reality, which is also scheduled to move into the new facility. The showroom will be used for presentations of the latest DFKI developments such as the Car of the Future as well as for public information events, which will include the use of visualization technologies. This contributes to making research concepts more accessible and imaginable, to better inform taxpayers and citizens, and to make decision processes more reliable. The Visualization Center will also host elements of the Intel Visual Computing Institute (Intel VCI) and the "AI in Commerce" Working Group.

3D model of the new DFKI building

These new technologies were already used to plan the new construction. Different design alternatives proposed by the Saarbrücken-based architect Oliver Brünjes were discussed and evaluated in Virtual Reality. Outstanding issues could be resolved rapidly and efficiently; architects and planners and, in the long run, also the owners benefit from the new developments at DFKI.

Guests at the groundbreaking ceremony could gaze into the future using the DFKI Augmented Vision Telescope: In an impressive demonstration of the 3D visualization technology co-developed at DFKI, a virtual depiction of the future Visualization Center is inserted seamlessly into the real landscape when viewed through the telescope.

Groundbreaking ceremony

DFKI at the Day of German Unity in Saarbrücken – Computers with Eyes, Ears, and Reason

The Day of German Unity 2009 in Saarbrücken is the venue for DFKI to present innovative possibilities for interactive digital books, semantic memories of a product life cycle, and 3D visualizations of the new riverwalk area being planned for the capital city of the Saarland.

The main celebrations for The Day of German Unity take place on Friday and Saturday, October 2-3, 2009 in Saarbrücken. The DFKI exhibits will be part of the community festival in the downtown area.

SEMANTIC PRODUCT MEMORY – A LOGBOOK FOR EACH PRODUCT

DFKI presents a technological vision of the future and the potential of semantic product memories on the theme island for Innovation, Economy and Science, which is part of the Saarland state exhibit area on Bahnhofstraße. The technology shown is being developed under the framework of the SemProM (Semantic Product Memory) project and is funded by the Federal Ministry of Education and Research (BMBF). The product logbook remembers the place of manufacture, dates, and environmental conditions. It knows what individual components have been built in, what properties the product has, and what was ordered by a specific customer. It knows how the product is stored, where it is to be shipped, and how it is to be operated.

Highly miniaturized embedded elements, RFID technology, instrumented environments, and smart sensor networks provide the technical basis for the capture and analysis of product-related observations at the level of individual items. The digital product memory enables users to check and track the complete manufacture and sales process for a single product all along the entire value-added chain in detail.

Applied to the food industry, the SemProM technology provides the possibility to store information in and recall it from the product memory, not only about the ingredients in the food, but also about the entire distribution history. The content of the product memory can be called up using a special browser and displayed on a screen.

The customer can now get information, for example, about the carbon footprint of a product or check whether the tomatoes on their pizza really originate from an eco-farm. Additionally, ingredients and other information printed on the product packaging can be enlarged for ease of reading with the aid of the Smart Product Magni-

Source: Saarland State Chancellery

fier. In this way, for example, people with allergies can recognize at a glance whether the food is a risk for them, or what additive is meant by a specific E-number.

The Smart Product Magnifier is being developed and implemented at the Innovative Retail Laboratory – a cooperative venture of DFKI and GLOBUS SB-Warenhaus Holding GmbH & Co. KG in St. Wendel.

THE VIRTUAL CITY RIVERWALK

DFKI will be using virtual reality tools to show the design concept for the new downtown area along the banks of the Saar River at the exhibition tent of the Saarland state capital Saarbrücken. The DFKI Working Group Agents and Simulated Reality, directed by Prof. Philipp Slusallek, will employ modern three-dimensional visualization methods to present the winning design entries.

The entire planning area for the "City Riverwalk" project encompasses approximately 1.5 kilometers along the banks of the Saar, several bridges and new structures. It has proven difficult to present and communicate the relationships and changes using only the traditional means like drawings and site visits. The whole project becomes much more vivid when viewed with the aid of an interactive, walk-in, three-dimensional model represented in stereoscopic mode. The viewing person can move about freely within the model, get quickly oriented, take in the views as seen by pedestrians from various perspectives, and, thanks to the stereoscopic presentation, evaluate all these views in terms of their spatial impact.

The challenge for the DFKI researchers was the integration of the various data models contributed by the surveyors, city-, landscape-, transportation- and bridge architects and then optimizing the model for presentation in a virtual reality environment. Processes had to be developed that will permit the planners to continue to use their traditional tools while at the same time preparing the three-dimensional models.

With this project of creating a visualization of the city riverwalk, the working group for visualization processes and methods of Prof. Slusallek brings techniques of visualization that are already widely accepted in the industrial sector to architects, planners, and homebuilders, specially attuning these methods to their particular challenges, allowing an efficient utilization of today's visualization technologies in these fields.

TEXT 2.0 – INTERACTIVE DIGITAL TEXT READER

The state of Rhineland-Palatinate will also have a tent on the Federal State Exhibit Mile. This is where DFKI Kaiserslautern will present "Text 2.0", a computer that "looks" the user in the eye: a multimedia interactive exhibit for the public. The eyetracker follows the gaze of the user and can localize the point currently being read. This adequately triggers the output of diverse multimedia effects in real time – sounds, music, photos, or color changes, all adjusted for the emotional context of the text. The type of multimedia feedback is defined by special annotations, unbeknown to the user. Text 2.0 will also be on display at the Frankfurt Book Fair 2009, from October 14-18, 2009 (page 7).

More information
www.dfki.de/web/tdde09
www.tag-der-deutschen-einheit.de

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MOONVID – Visual learning from YouTube, Flickr, and Co.

Users worldwide are now collecting greater amounts of multimedia data than ever before. Every minute, 20 hours of new video are uploaded to YouTube, and Flickr receives 2000 new photos in that period. This abundance of data offers not only visual content of a diversity and dynamic never seen before, it is also remarkable because of a new type of user interaction: a large community of internet users not only view the images and videos, they also tag and categorize, comment, and discuss them.
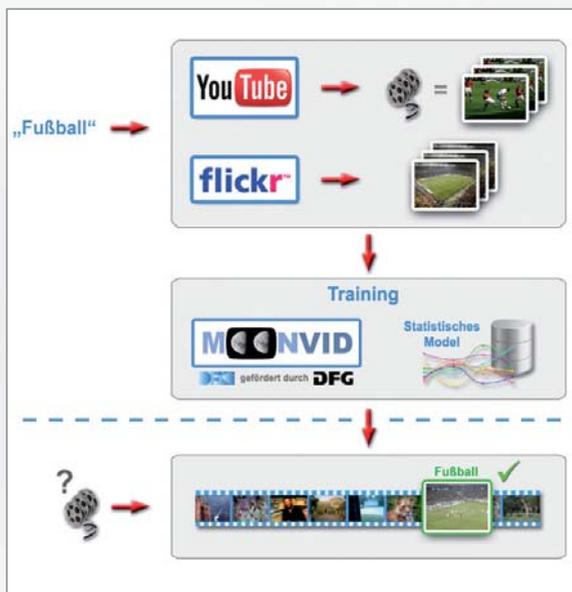
Internet portals like YouTube, Flickr, and Co. provide the opportunity for a new approach to visual learning. Whereas in the past, the systematic training of a visual recognition computer was limited by a relatively small, manually acquired data basis, it is now possible to use the content of whole websites. To learn the concept of "soccer", for example, large data volumes from Flickr or YouTube are automatically downloaded and analyzed using special machine learning programs. The result is a recognition system that, in turn, can be employed in the identification and retrieval of concepts in other images and videos. In effect, this means the system learns to find "soccer", by watching YouTube videos tagged with "soccer". Because all this is fully automated, hundreds or thousands of concepts can be learned and detected, which means much more flexible and scalable recognition systems can now be developed.

This is precisely the goal of the MOONVID Project (Statistical **Mo**deling of **On**line **Vid**eo Content), which is being conducted at the Image Understanding and Pattern Recognition department of DFKI with support from the Deutsche Forschungsgemeinschaft (German Research Foundation, DFG). The following aspects are of major relevance for visual learning from web-based data:

▶ What are the most appropriate visual characteristics and learning methods for modeling large and diverse data volumes such as YouTube and Flickr?

▶ User generated annotations represent a source of information with limited reliability – how can the robustness of visual learning be improved in view of faulty, incomplete and imprecise training data?

▶ Users not only annotate videos, but also assign categories, evaluate and discuss them. How can the categories and user information in web portals be exploited for visual recognition?

▶ How can the motion information contained in web videos be used to improve recognition?

The early results from the MOONVID project are quite promising: Quantitative findings show that with YouTube-based training methods, similar accuracy can be attained as with conventional, manually annotated training data. The web-based demonstrator "TubeTagger" (www.dfki.uni-kl.de/~ulges/tubetagger) offers a practical impression of the performance potential of web-based visual detectors.

More information and video
www.dfki.de/moonvid

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Reading to date has been a static activity, and written texts could never interact with the readers and their individual ways of reading.

Now, Text 2.0 is about to change all that: Aided by an eyetracker, Text 2.0 determines the position of the eyes on the screen and relates to the portion of the text currently being read. The system introduces context-related multimedia effects, such as photos, background noises, or music appropriate to the subject.

led True Stories from Nature
cture of a boa constrictor in th
a copy of the drawing.

the book it said: "Boa cons
thout chewing it. After that t

Text 2.0 can do even more than that: Translations of foreign language text passages are displayed just as the passages are being read. Intelligent footnotes explain complex concepts and there is even a syllabic hyphenation of difficult words, if desired. Ever lost your place while reading? Now a red arrow marks the place where you stopped.

Text 2.0 at the Frankfurt Book Fair

Text 2.0 is an integration of two concepts: Augmented Text refers to the explicit enrichment of a text with actions, which are executed when certain words or text passages are read – displaying, for example, photos and sounds in real time. Augmented Reading in contrast provides implicit support to the reader based on the actual reading conditions and dependent on how attentive the reader is at the moment or whether he momentarily hesitates or is daydreaming.

DFKI will be presenting its vision of Text 2.0 at the Frankfurt Book Fair, October 14-18, 2009. Visit us and try it out for yourself in Hall 4.2, Stand K441!

More information
http://text20.net

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Visualization of the historic fortified city of Saarlouis

Established under the reign of Louis XIV and designed according to the plans of his chief military engineer, Sébastien Le Prestre de Vauban, the historic fortifications to date define the hexagonal outline of the city. To present the fortifications' original conditions, which have been subject to constant adjustment processes, is one of the concerns of the visualization project of DFKI and the city of Saarlouis.

DFKI research group Agents and Simulated Reality has prepared a realistic and historically accurate 3D model of this ancient fortified city, just as it was when Vauban had it planned and constructed in the 17th century. The computer graphics based on the VR system developed at DFKI provides a virtual, interactive tour through the historic city. The site, structures, and expansion of the former Saarlouis and its fortifications can be represented vividly related to today's buildings.

This visualization makes the city's French heritage far more accessible for all those who are interested. Discussions have included diverse opportunities to exploit the fortified structures while at the same time preserving them for future generations as well as how the unique history of these defensive constructions can be presented as an interactive and virtual experience for visitors today.

This 3D modeling is also the basis for an upcoming film which will detail the construction of the fort during the French period and the subsequent modifications imple-
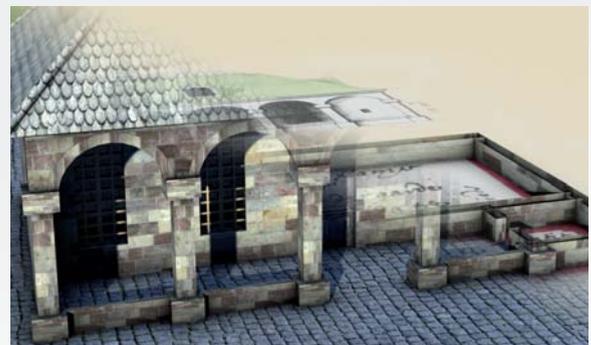
3D visualization

mented by the Prussians. Model and film of the Vauban city can be seen in a VR show on November 11, 2009 at the State Offices of Saarland in Berlin on the occasion of the exhibit "Saarlouis – a French Fort in Germany". Visitors will be able to experience the 3D model live.

More information
www.viscenter.de

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DFKI Innovation Fair "Semantic Technologies" November 5, 2009 at DFKI Kaiserslautern, 09:00 – 17:30

Smart semantic applications for manufacturers, service providers, and public administration

AN OVERVIEW OF THE PRESENTATIONS

NEPOMUK – THE SEMANTIC DESKTOP

Use your computer like it was a personal semantic network! Link e-mails, files, address book entries, photos, or appointments stored at different locations in your personal computer. The transfer of semantic web technologies onto your computer enables uniform data display regardless of the original software used to create them.

CONTASK – ADAPTIVE ASSISTANCE FOR THE KNOWLEDGE WORKER

Various aspects of information relevant to the user, such as known solutions, possible know-how data bases, or other sources of interest, are proactively offered in the context of the actual task. The knowledge created by the individual user while working on the problem is preserved and offered, in turn, as an experience transfer to the problem solving work of other users.

TOUCH&WRITE – PENABLED INTERACTIVE SEMANTIC TOUCHTABLE

Touch&Write, the digital rear projection table, recognizes several pen and finger gestures as well as handwritten inputs and simultaneously evaluates them. Touch&Write combines camera-based multi-touch capabilities with the high-resolution technology of digital pens. The recently developed table surface enables the exact positioning of a digital pen as well as the recording of every movement. For example, notes taken at a meeting undergo immediate digital processing and are then provided as semantic information.

MEDICO – SEMANTIC ANNOTATION AND SEARCH FOR MEDICAL IMAGES

The THESEUS MEDICO usecase examines and develops methods and mechanisms to enrich medical imaging materials (computer tomographics, x-ray images, ultrasonic images) with semantic data, so as to enable interpretation by the computer. This facilitates accurate searches in this sensitive area.

KAUKOLU – SEMANTIC WIKIS AS CORPORATE KNOWLEDGE BASE

Kaukolu extends traditional wikis to the semantic level. The process demands the use of various manual and automated methods of generating the metadata. The content of the wiki becomes something a computer can interpret using the underlying ontologies. The identification of events, projects, and colleagues produces a significant improvement in content-specific search and navigation tasks.

MYCBR – CASE-BASED REASONING FOR SIMILARITY-BASED SEARCHES

Case-based reasoning (CBR) simulates experienced-based problem solving. It is especially practical in the support of the staff at call centers or IT-help desks, and for product search in e-Commerce applications. In order to compare client requirements with product descriptions, similarity measures are used. myCBR is a graphic tool for the simple design of such similarity measures and serves as a basis for the development of knowledge and content-based search applications.

DFKI Kaiserslautern

iDOCUMENT – INTELLIGENT INFORMATION EXTRACTION FROM DOCUMENTS

A knowledge assistant, iDocument interprets documents within a data domain and automatically recognizes known persons, projects, events, locations, etc. The content of relevant files is transferred using information extraction methods and linked with the background knowledge to the semantic network. A complementary semantic search allows the exploration of the network and supplies the user with the resulting relationships and concepts.

ESB – ELECTRONIC TROUBLESHOOTER

ESB employs semantic technologies and optimizes knowledge management to support the maintenance of complex equipment. The systematic and formal recording of faults and the response measures taken combine with a detailed machine model to form the basis for a rapid access to situation-specific information. Success stories where this solution has already been employed can be found in underground coal mining and in the design, construction, and servicing of special machinery.

TECHWATCH – INNOVATION MONITORING

This monitoring system is based on information about patents and publications and, in principal, is intended for use in all fields of technology. Users enter keywords and receive the following search results: relevant per-

sons, organizations and companies, patents and publications. The relationships between these search results are illustrated graphically.

SEMANTIC TECHNOLOGIES IN MACHINE TRANSLATION

The technical aspects of machine translation as seen in the EuroMatrix and EuroMatrix Plus projects aim at improving the translation quality through lexical-semantic models of the application domains. A detailed semantic classification of the domains indicates the need for specific lexicons in order to significantly improve the terminology selection process for use in the translation.

OFFICE ROBOTS

The Talking Robots group is working on an integrated methodology that enables the robot to process spoken language and relate subjective understanding to the surroundings. In this way, the robot is capable of optimal cooperation with humans.

TAKE – SEMANTIC FULL-TEXT SEARCH IN PDF DOCUMENTS

TAKE is a browser-based application that supports the user in the semantic search in the content of text files. In an offline process, the texts (PDF or Office formats) are analyzed record by record in terms of morphology, syntax, and semantics. In this way, they can then be searched in a simplified form (subject, verb, and other sentence objects).

SENA – SEMANTIC NAVIGATION OF DOCUMENT REPOSITORIES

SENA is an interactive computer search tool based on automatically generated semantic file annotations. The system supports topic related searches by directing the user to other files after making a selection from a subject index.

MULTI-MODAL ACCESS TO LARGE DATA VOLUMES

The multi-modal, interactive response system developed under the framework of the THESEUS program illustrates just how information, multimedia content, and services may be accessed by using spoken language, keyboard input, and gestures, using the example of Wikipedia and an extended music ontology.

SEMPROM – SEMANTIC PRODUCT MEMORY

Smart labels give products a memory and support intelligent logistics. Products keep their own logs, know their place of manufacture, know what features they possess, and what their transportation destination is. In the context of the ICT- 2020 research funding program of the Federal Ministry of Education and Research (BMBF), the Innovation Alliance Digital Product Memory is developing the key technologies for the Internet of Things with the collaborative SemProM project.

SEMANTICS AT HOME

The interaction and navigation inside the Bremen Ambient Assisted Living Lab (BAALL) is based on the technologies of semantic modeling. The systems represented here use semantic technologies such as ontologies or spatial calculation to enable a multimodal inter-

DFKI-Showroom

action with a mobility assistant for wheelchairs and the intelligent home. Input media like the head-joystick, touch screen, or spoken word may be used.

SEMANTIC DIALOGUE TOOLS

Based on the research of the Secure Cognitive Systems department and the University of Bremen, these semantic voice response tools support the formal development of semantic-based human-machine-interaction models in various applications, such as natural language dialogs with different systems.

COMPANYM – MERGING AND MONITORING

CompanyM (M stands for "merging and monitoring") collects, based on an ontology, corporate financial data. The results are then enriched with timestamp information and compared with previously known data. Any changes are automatically identified and made accessible, for example, to banks or rating agencies or even regulatory institutions and business journalists.

More information
www.dfki.de/web/news/innovationfair_2009

MarIT – Intelligent Marine Technology for the 21st Century

MarIT MarIT is a coordinated project that aims to facilitate the pooling of national competencies in the field of maritime technologies. In addition to the ongoing research and development activities, the broader goal of MarIT is to establish a competence network for marine technologies and to increase the German market share of the global revenues in the areas of deep ocean exploration, extraction of raw materials, and use of natural resources. The major emphasis is on the exploitation of undersea resources and the development of application fields such as gas/oil, seabed mining and gas hydrates.

MarIT is an initiative moderated by the Robotics Innovation Center of DFKI Bremen in coordination with the network partners and the Federal Ministry of Economics and Technology (BMWi). In order to highlight the importance of marine technology in relation to other fields of technology, a political and technical framework is needed. MarIT is an effort to bring to-gether all the national players in politics, research, and businesses in terms of marine technology. In this way, a strong starting position can be established for networking and pooling resources, expertise, and initiatives. The performance of research and development projects along with the development of technology demonstrators will strengthen the national competence. Thus the existing technologies can be improved and modified to better serve the existing market conditions and innovative technologies can be pursued in order to remain or become competitive in the future. Furthermore, the

initiative seeks to identify market opportunities in order to improve the positions of the network partners within a global environment, and to facilitate access to test and research institutes.

More information
www.marit21.de

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Robotics Innovation Center intensely involved in the model region "Electromobility NordWest"

pmc personal mobility center
The German Federal Ministry of Transport, Building and Urban Affairs (BMVBS) announced the start of the nationwide "Electromobility model regions" program in August 2009. Eight regions were chosen out of more than 130 applicants: besides the metropolitan areas of Berlin/Potsdam, Hamburg, Munich, Stuttgart, and the Rhine-Main, Rhine-Ruhr and Saxony regions, the selection included the Bremen/Oldenburg region.

The BMVBS electromobility program is included in the second economic stimulus package and provides € 115 million in targeted research and development funding until 2011 to evaluate and prepare the market for electromobility. It involves the study of effective ways to integrate alternative drive concepts with passenger vehicles, public transportation, delivery trucks and utility vehicles as well as motorcycles. Furthermore, a user friendly and safe charging infrastructure shall be established. The candidates for the model regions include regionally organized manufacturers, collaborative research groups, cities, communities and geographic regions.

The regional project management for the model region "NordWest" is coordinated by the Fraunhofer Institute for Manufacturing Technology and Advanced Materials (IFAM) together with the Robotics Innovation Center at DFKI Bremen and is directly linked to the national program management center at BMVBS.

The "Electromobility Region NordWest" is focused on the following areas:
▸ Regenerative energies, e.g., wind power
▸ Combinations of urban and rural transport
▸ Establishment of a resilient and sustainable concept for the integration of e-cars and technological developments.

As the central source of information in the "Electromobility Region NordWest", the Personal Mobility Center (PMC) has been established as the regional project coordination office. This office is responsible for all administrative processes related to the project.

More information
www.personal-mobility-center.de

DFKI wins World Championship in Robot Soccer

The World Robot Soccer Championships were held in Graz, Austria from June 29 to July 5, 2009. All continents were represented, 18 countries participated by sending 24 teams and more than 150 team members to compete for the title in RoboCup 2009. The winner and new world champion in the Nao league is: Team B-Human from DFKI Bremen.


The B-Human team dominated the Standard Platform League throughout the entire competition. In the eight matches played, team B-Human, coached by Dr. Thomas Röfer, posted a scoring difference of 64:1 and shot more goals than all other 23 teams combined. B-Human also won the technical competition and shared this honor with the HTWK Nao team from Leipzig. The technical competition consisted of mastering three tasks relevant to the continued development of the Standard Platform League. Team B-Human excelled at meeting the obstacle identification and avoidance challenge. This task involved finding and moving to various specific points on the playing field as accurately as possible while knowing only their coordinates.

Other robots encountered along the way must be avoided. Mastering these two criteria was key to the success of the B-Human team at the soccer tournament. In the majority of cases, the team's robots were able to make the right moves because they always knew their own location on the field and could outmaneuver the opponents.

The B-Human team is composed of 12 students from the information systems program at the University of Bremen and is advised by three members of the DFKI staff from the Department of Safe and Secure Cognitive Systems. The team independently developed the entire control bandwidth for the soccer robot: cognition, environmental modeling, behavioral control, team communication, and locomotion.

The RoboCup is an international initiative to promote research in the fields of artificial intelligence and robotics. The goal of the RoboCup is to build a team of autonomous, humanoid robots that is capable of defeating the reigning human world champions before the year 2050.

Photo: Rainer Fromm
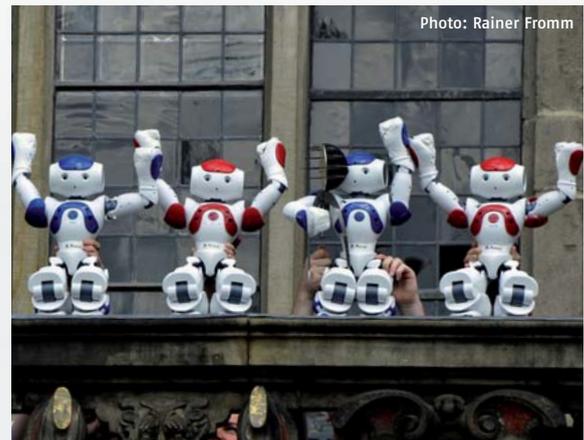
In order to achieve this ambitious goal, each different league has been assigned a different focus of research. The Standard Platform League requires standard hardware to be used, i.e., all robots are of identical construction. The challenge for the competing teams is the software programming. The standard platform used until 2008 was the four-legged Sony AIBO, which was replaced this year by the French humanoid robot "Nao" from Aldebaran Robotics. This robot is equipped with more than 21 flexible joints, two cameras, numerous sensors, and an onboard computer, which makes complete autonomy possible.

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Innovative Factory Systems:
An introduction to the new research department IFS

Useware engineering, control systems design and ambient intelligence in automation engineering are the research topics of the new DFKI department Innovative Factory Systems (IFS).

The IFS research department originated at the Center for Human-Machine Interaction (ZMMI), which was established in 1998 by Prof. Detlef Zühlke, who, since 1991, is also Chair of Production Automation at the Technical University of Kaiserslautern. ZMMI is situated in the mechanical engineering area and, as a knowledge transfer point between academia and businesses, serves as a consultant for the development of user oriented, ergonomic control systems for devices and equipment of any size, from laboratory scales to space filling printing equipment and even complete production lines. Today's research results, for example, from useware engineering, ambient intelligence, and robot programming, flow into the ZMMI consulting and training portfolio in a timely manner. Many follow-on projects and a diverse client base that includes many well-known companies are key indicators of an industry demand for such consulting services in the area of Human-Machine Interaction. IFS will continue to satisfy this need in the future, whereas the new alignment with DFKI establishes a new focus.

ZMMI develops and evaluates operating concepts in the SmartFactory^KL, the first factory of the future where "smart" industrial plant engineering can be employed and tested. The SmartFactory^KL in Kaiserslautern-Siegelbach is a unique technology demonstrator, which, like ZMMI, establishes bridges between academic research and commercial applications. The Smart Factory^KL technology initiative is a non-profit organization, dedicated to supporting the R&D projects of research institutes and businesses of all sizes.

As a founding member of the SmartFactory^KL technology initiative, DFKI has been a vital partner from the beginning and, as the operator, took on the major challenges such as providing and maintaining the building space as well as the support for the construction of the demonstrator facility itself. In May 2009, the integration of

ZMMI with DFKI Kaiserslautern was completed as a natural consequence of the growth of SmartFactory^KL, its many projects, and reputation. The name of the new department, Innovative Factory Systems, illustrates that the focus of research will be on the SmartFactory^KL, which by no means precludes the further provision of consulting services by the Center for Human-Machine Interaction. Professor Zühlke and his team will likewise continue their involvement with educational activities at the TU Kaiserslautern. Effective October 2009, they will be supported by the new assistant director of the department, Dr. Jochen Schlick, who has worked for many years at ZMMI and, in 2005, earned his doctorate degree under Professor Zühlke.

The work of the IFS department is application-oriented and has practical relevance as summarized below:

▶   IFS continues to function as the point of coordination for the operation of the SmartFactory^KL and appoints the Chairman of the Board, Prof. Dr. Detlef Zühlke, the executive manager, Rüdiger Dabelow, and the scientific coordinator, Peter Stephan. The mission of the SmartFactory^KL remains the same: to develop innovative industrial plant technologies with a wide spectrum of applications in various business sectors; to promote their use and expansion and to establish the scientific and practical basis for the widespread use of innovative industrial plant technologies. Additionally, the SmartFactory^KL is available as a demonstration and application partner, for example, for the Semantic Product Memory (SemProM) project.

▶   Ambient intelligence in automation engineering: The future focus of ambient intelligence (AmI) is the study and development of so-called "smart technologies", which must also keep pace with development in

modern manufacturing plants. The SmartFactory[KL] promotes the scientific analysis and interdisciplinary development of ambient systems, for example, through its cooperation in the state government's priority research program Ambient Systems established at TU Kaiserslautern in June 2008.

▶ The design of control systems and useware engineering will remain the major focus for the research performed at the SmartFactory[KL] and IFS, which includes the very successful Universal Control Devices project. IFS will also continue its cooperative research activities, for example, with various departments of the TU Kaiserslautern as well as its consultative and training services for manufacturing enterprises.

The integration of ZMMI as a research department was the next logical step following years of intensive cooperation with DFKI and will strengthen the immediate IFS topics as well as DFKI as a whole in the long term.

After the completion of the new DFKI building, the current geographic separation will be eliminated as well, and, over the next few years, the IFS-Team will move in on Trippstadter Straße, along with the entire SmartFactory[KL].

More information
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VOICE Award 2009 – The "Oscar" for the best voice computers

The 6th Annual VOICE Awards for the best interactive voice response systems, long established as an industry highlight, is organized this year under the new name "Voice Days plus" and, for the first time, integrated with the Nürnberg Trade Fair (October 6-7, 2009). All services entered in the competition must undergo a comprehensive testing procedure at the independent DFKI test lab. 20 systems qualified for the final round this year. The jury, chaired by Prof. Wolfgang Wahlster, then selected nine finalists in the five categories.

Prof. Wahlster sees the next wave of innovation for such interactive voice response systems already on the horizon: "The effort is now on the semantic analysis of client concerns as formulated on all language communications channels and the accurate recording of complex customer desires from telephone conversations, SMS, e-mail, and Web 2.0 channels through the use of automated language understanding and, integrating this information with the knowledge management process to ensure a positive customer experience using smart dialogs."

Web 3.0, which is a combination of the semantic web and Web 2.0, will be the realization of a completely new dimension of the Internet of Services in the near future and the language processing for automatic information extraction from unstructured inputs represents a key technology.

Major advances in the area of voice classification are leading to new application solutions in the area of

l.-r. The Jury: Mario Ellebrecht, Manja Baudis, Christian Thunig, Prof. Wolfgang Wahlster and Manfred Stockmann

authentication and biometric determination of gender, age group, and the emotional status of the caller. Mobile internet applications produce innovative opportunities for ubiquitous client contacts in multimodal applications on today's android devices or iPhones, seamlessly combining voice input with multi-touch functionality so that an intuitive client interaction is possible anywhere and at any time.

More information
www.voicedays.com

▶ DFKI presents key point paper "Ressource Auto"

Safer, more efficient, cleaner – that's how the car of the future shall be. Just how safe and comfortable, re-source- and environmentally friendly individual vehicles will be in the near future, DFKI and other members of the Saarland networking initiative "Automotive Saarland" presented to Dr. Karl-Theodor zu Guttenberg, German Federal Minister of Economics and Technology in the Saarbrücken Conference Centrum on the occasion of the Business Forum of the CDU fraction of the Saarland state parliament.

DFKI showed Minister zu Guttenberg multimedia appli-cations for cars. Twitter4Car, for example, demonstrates how multimodal interaction can work with internet-based services in the car of the future using the exam-ple of the micro-blogging-service "Twitter". In addition to voice commands and touch screens, the system can also be controlled by glances and gestures. BabbleTunes, a multimodal interactive system developed by DFKI spin-off SemVox, enables the intuitive, voice-controlled ope-ration of MP3 players in cars. A unique feature is that the user can not only access the entire music collection using speech input, but can also call up all the other MP3 functions with his voice.

Handoff of key point paper to Minister zu Guttenberg

In the future "Ressource Auto" workshop, the concept is to advance the idea of the totality of automobiles as a resource. Prof. Wahlster presented Minister zu Guttenberg a key points paper on the "Ressource Auto" concept. The paper sketches out a new and contempo-rary view of how cars can move away from being resour-ce consumers to becoming important resource providers. For example, cars can collect and store electrical energy by functioning as a generator and feeding power into the grid.

Automotive components made of smart materials and monitored by intelligent sensor networks will make it possible, even under extreme conditions, to employ lighter and more stable designs. Following a systematic and intelligent disposal of such vehicles at the end of their useful life, valuable materials can be reutilized or

placed back into the material cycle. Cars may even serve as communication nodes to network motor vehicles with each other (Car2Car) as well as to improve the available internet service in regions with a poor infrastructure.

In the future, cars will also serve as a knowledge re-source. Detailed information about the road conditions will be read from the sensor data in the vehicles: the actual friction coefficient of road surfaces, the collected acceleration and gradient data, fuel consumption, and much, much more valuable data, even including the stress level of the driver, all of which can be processed to produce more than just detailed map material for navigation devices. Even central services like weather reports could access the millions of auto sensors, to make up for local gaps in the infrastructure.

The mid-term goal of the future initiative is to create an entirely new branch of industry and a sustainable boost for the small- and medium-sized businesses sector, especially for the Saarland.

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DFKI on the German Promenade in China

Under the auspices of the successful "Germany and China – Moving Ahead Together", DFKI once again will exhibit current research prototypes on the German Promenade, this time in Wuhan, the next to the last stop in the event series. In June 2009, visitors already had the chance to visit the DFKI exhibits and two of its spin-offs in the Federal Ministry of Economics and Technology (BMWi) Pavilion in Shenyang.

BabbleTunes enables voice-controlled operation of an iPod. It is no longer necessary to search for songs in a list, the user can rather select one directly with a simple voice command. BabbleTunes is a product of the BMWi funded THESEUS-program and is being further developed and marketed by DFKI spin-off SemVox.

The DFKI Digital Sommelier provides product information to the customer in order to assist in selecting the appropriate wine. An RFID chip affixed to the bottle stores data about the wine: what region and which vineyard it originates from and with which foods and at what temperature it should be enjoyed. As the bottle is taken from the shelf, the consumer hears the information via voice output. A variety of supplemental sensors can also deliver situation-related data, for example, whether the wine has been shaken, or whether it should be decanted after opening.

Yocoy, another DFKI spin-off, will be presenting a mobile information and language translation assistant for foreign travelers. One of these applications, called Smart Dining, was developed for the Olympic Games in China and offers practical advice at the restaurant. There is also the Taxi Exchange Assistant that facilitates understanding between Chinese taxi drivers and their foreign passengers. Yocoy is an electronic tour guide, dictionary, and interpreter program all in one, with software that runs on internet enabled mobile phones, Smartphones, or PDAs.

"Germany and China – Moving Ahead Together" is an event in China initiated by the Federal Republic of Germany with the goal of promoting mutual understanding as the basis for successful cooperation and strengthening Germany's image as a forward-looking, innovative country. The official sponsor is the Federal Foreign Office and partners include the Asia-Pacific Committee of German Business, the Goethe-Institute, and the "Germany – Land of Ideas" initiative. The series of events is jointly patronized by German President Horst

Köhler and Hu Jintao, President of the People's Republic of China. Between Fall 2007 and Spring 2010, "Germany and China – Moving Ahead Together" visits the major regional centers of China: Nanjing (Fall 2007), Chongqing (May 2008), Canton (Fall 2008), Shenyang (June 2009) and Wuhan (October 23 – 31, 2009). The climax of the series is the World Fair in Shanghai 2010.

More information
www.deutschland-und-china.com

Information about the THESEUS-program
http://theseus-programm.de

The DFKI spin-off SemVox
www.semvox.de

The DFKI spin-off Yocoy
www.yocoy.com

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Interview with Dr. Dato' Abdul Wahab Abdullah, President and CEO, and Dr. Dickson Lukose, Head of the Knowledge Technology Cluster of MIMOS Berhad – The Malaysian Institute of Microelectronic Systems

DFKI: MIMOS is one of the leading IT research organizations in Asia. You are the President and CEO of MIMOS since 2006. What is the vision and what are the core values of MIMOS Berhad?

Dato' Abdul Wahab Abdullah: Our vision is to transform MIMOS' research results into applied technologies. Our overall goal is to develop and strengthen the local engineering industry. Because most of the industry in Malaysia is related to system integration, we don't have a very strong engineering industry. Our future interest is to develop proprietary technologies that enable our local engineering industry to play a coequal role in the global community.

Dr. Dato' Abdul Wahab Abdullah

DFKI: There is a lot of common ground in recent research between MIMOS and DFKI. Which research topics could be in the foreground, and what does that mean for your collaboration with DFKI?

Dato' Abdul Wahab Abdullah: Our collaboration with DFKI mainly targets on knowledge leverage and how we can share our knowledge in the research world. During the walk-through at DFKI we have seen some very interesting agglomerations of excellence, and we can determine where we can fill in with our expertise to facilitate the collaboration.

DFKI: MIMOS is a strong company in AI, do you do research in other fields as well?

Dato' Abdul Wahab Abdullah: MIMOS not only focuses on AI technologies but also on wireless and security technologies. A serious interest is how DFKI can help us to integrate these fields into the AI world – how they can be incorporated in a platform to serve the market and to offer solutions to the industry sector.

DFKI: Which is the main target industry for your development plans?

Dato' Abdul Wahab Abdullah: Our focus today mainly is on Information and Communication Technologies. We see ICT not only as web services, we are looking beyond this: we are also going to support our economy in the area of agriculture. We will transform the agricultural sector by developing specific IT solutions. The same holds for the industrial sector. This is how we expand ICT beyond web services; it is an approach to make sure that we change the economic landscape of Malaysia by incorporating IT into our new industries.

DFKI: DFKI is working on an agricultural project for two years now. We use the same buzzwords – say, precision farming for instance. Do you see a basis for cooperation or a potential for common projects in that respect?

Dato' Abdul Wahab Abdullah: Yes, we call that PA – Precision Agriculture. And most definitely I see the potential of our common research, especially when it comes to shared solutions. We have very similar goals; only the approaches and real world adaptations are different, because our practical needs are different. Obviously, a lot of customization and tailoring to specific requirements has to be done for the European market compared to the Asian markets. Just consider the weather: Europe has four seasons; we have only two – monsoon season and dry season. The soil is different, and so is the treatment. But DFKI and us, we definitely can work together. And this is why we're here – to work together!

DFKI: What are the specific research challenges especially for Malaysia and how would you cope with them?

Dato' Abdul Wahab Abdullah: Our unique approach is to not only look at the semantics of the platform that we drive, or let's say, the AI – we also think about putting it in the main technologies. We are talking about wireless technology, about the security layers that must be incorporated. We are also looking at grid computing, how we can drive our plantations using supercomputers. These are the very big topics in which we can learn from each other. We have done a concept for one of our largest palm oil producers, with which we are working together very closely. They intend to realize huge intelligent plantations.

DFKI: Compared to the big plantations in Malaysia, the farms in Germany are smaller and more diverse.

Dr. Dickson Lukose: The challenges are the same, only the knowledge bases are different, because different regions request different knowledge bases. We have certain types of crop; you have different types of crop. Your terrains are different and your weather is different, so the kind of knowledge you are using and your reasoning engines are different. The contributions to the framework under which we are going to be working are com-

plementary. We can use some of the components that DFKI has built; some of the things that we have made DFKI can incorporate. This is how I think our collaboration will progress in the future.

DFKI: You used the word "semantic" a while ago: MIMOS has established a Center of Excellence in Semantic Technology, in collaboration with local and foreign universities and industry players. What are the goals of this center?

Dr. Dickson Lukose: The goal that we address with the center is to create awareness for this technology in our local industries, to bring university researchers who are doing blue sky research on the road map. They can provide us with the necessary fundamental research that we can apply in the industry for the next few years. We are working with the centers, we are working with the universities, and we are working with the industry. We also set up labs in various universities, because we don't have all the expertise we need in-house. Sometimes universities do have such an expertise, and we are looking for these key experts, so that they work with us on various semantic projects.

DFKI: So the idea is quite similar to DFKI's approach to build a bridge between blue-sky research and applied science.

Dr. Dickson Lukose: Exactly. We want to be a player in the applied area and we want the universities to help us doing the pure research. We collaborate with them, and we create the roadmap and get the universities to be involved with us. In a few years time the result will be things we can actually apply in the industry. While MIMOS has a better understanding of what industry needs, the fundamental solutions still need to be done at the universities.

DFKI: Do you think that the DFKI-model of public-private-partnership could be a model for MIMOS?

Dato' Abdul Wahab Abdullah: MIMOS today is fully funded by the government. We have a board comprised of members of different ministries, the Ministry of Finance, the Ministry of Science and Technology, and so on. They are stakeholders from the public sector. For the future, we will stay government-funded, but we also plan to gain funds from the private sector for specific projects. Financing from the private sector adds value – if the private sector puts money into a company, it's not because that company doesn't have the money itself, but because they see the value of this company. I am CEO at MIMOS for two and a half years now. We are building a new platform, new projects are coming up, and the whole organizational structure will be subject to change. We are going through a tremendous transformation.

DFKI: Is there anything you would like to add?

Dato' Abdul Wahab Abdullah: I'd like to stress that we really appreciate being here. The CEOs and the management at DFKI are very helpful. We are very open now for future collaboration. I think this will build up a new traction, a new engagement of Malaysia in Europe again. I think this is an excellent opportunity for both institutions to work together!

DFKI: Thank you very much for the interview!

l.-r. Prof. Andreas Dengel, Dr. Dickson Lukose, Dr. Dato' Abdul Wahab Abdullah, Dr. Ansgar Bernardi

Smart assistant systems for retailers and customers at the Innovative Retail Laboratory

The IRL – Innovative Retail Laboratory, located at the GLOBUS SB-Warenhaus Holding head office in St. Wendel, is one of the 365 Landmarks in the Land of Ideas of the initiative Germany – Land of Ideas 2009. The Office of the German Federal President patronizes the ongoing initiative. The public was invited to visit and learn more about IRL and its joint work with GLOBUS SB-Warenhaus on May 18, 2009.

DFKI studies smart services and innovative concepts of interactive shopping at the Innovative Retail Lab: a shopping list that coordinates with the store and checks for current specials; a shopping cart that guides the customer to the desired products and provides recipe suggestions and reminders so that customers don't forget anything; a digital product magnifier that informs the customer about the product source, its ingredients or

CEO of GLOBUS Thomas Bruch and Prof. Wahlster

Prof. Krüger at the Easy Checkout

allergenic risks. Routine shopping becomes an interesting experience with virtual personal consultants like the Digital Sommelier, the computer animated sales assistant at the interactive information desk, or the smart dressing room. At the Easy Checkout, the bill for the entire contents of the cart is calculated without having to remove them from the cart. Payment can be made with the instrumented car key. After the purchase, an intelligent cooler insures that food stays cooled down until it reaches the intelligent fridge at home.

Prof. Antonio Krüger, Scientific Director of IRL, stressed the cooperative nature of the DFKI research in this area with partners like SAP, IDS Scheer, BMW, and DHL: "The IRL is a facility jointly operated by DFKI and GLOBUS with the aim of conducting outstanding research from a retail user's perspective. This DFKI Living Lab in Saarland is the main applications lab where you can touch innovations that are currently under development", said Krüger, who also joined the Saarland University in the summer semester 2009 as a professor for computer sciences.

"Besides providing scientists and retail experts with a platform for the successful transfer of excellent research results into practical applications, the public will benefit from the IRL by gaining a direct access to future technologies suitable for daily use, too."

Linked to actual warehouse data and processes and in direct cooperation with the practitioners, the home and market areas are fully instrumented, networked, and equipped with sensor systems that allow the testing and evaluation of new forms of customer interaction and intelligent business logistics in a close-to-reality environment.

At the IRL, concepts for the Federal Ministry of Education and Research (BMBF)'s Innovation Alliance Digital Product Memory are being studied and implemented, too. The BMBF project SemProM (Semantic Product Memory), directed by Prof. Wahlster, is working on key technologies for the Internet of Things, where smart labels, for example, give each product a "memory". The potential of these "intelligent" products goes far beyond the simple identification function of today's RFID tag systems. The labels retrieve and analyze data from various embedded sensors (e.g., temperature, light exposure, moisture, speed, acceleration, position) while, at the same time, capturing all relevant product and operational data. The Internet of Things is intended to provide an opportunity for the active exchange of such information with the environment, the users, and with other products. Manufacturing relationships will become more transparent, supply chain and environmental influences can be tracked more easily, suppliers receive better support, and consumers are informed to a much greater extent. The Internet of Things hence opens whole new opportunities for the retail sector.

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iMUTS – New interaction concepts for 2D and 3D worlds

The iMUTS (interscopic multi-touch surface) project, funded for a runtime of 3 years by the Deutsche Forschungsgemeinschaft (DFG), will start by January 1, 2010 at DFKI in Saarbrücken under the lead of Prof. Dr. Antonio Krüger. In cooperation with the Institute for Computer Sciences at the University of Münster, the goal is to develop new interactive concepts for multi-touch surface computing. An interscopic multi-touch surface enables the user to intuitively interact with 3D objects shown in stereoscope and, similarly, with the more traditional monoscopically displayed 2D content.

Many more areas of application now demand visualization and interaction in computing environments with three-dimensional data. Two-dimensional desktop systems significantly limit the user's ability to do this by failing to support the intuitive and natural input options. Sophisticated 3D user interfaces, as provided by virtual reality (VR) systems consisting of stereoscopic projection and tracked input devices, are rarely adopted by ordinary users or even by experts. Since most applications dealing with three-dimensional data still use traditional 2D Graphical User Interfaces, current user interface designs lack adequate 3D features and user support.

Multi-touch interaction has received considerable attention in the last few years, in particular for non-immersive, natural 2D interaction. Some multi-touch devices even support three degrees of freedom in terms of 2D position on the surface and varying levels of pressure.

Multi-touch interfaces represent a good trade-off between intuitive, constrained interaction on a touch surface and unrestricted natural interaction without any user instrumentation (such as data gloves). They have the potential to form the fundaments of the next generation 2D and 3D user interfaces.

Stereoscopic display of 3D data provides an additional depth cue, but until now, challenges and limitations for multi-touch interaction in this context have not been considered. The iMUTS can effectively bridge the gaps between classical 2D Graphical User Interfaces and fully immersive 3D environments. They provide intuitive, fast and spontaneous access to 3D information for multiple users at low costs without requiring user instrumentation e.g. with special glasses or gloves.

In order to underline the potential of the proposed iMUTS setup, the DFKI will develop and evaluate different interaction metaphors for different domains. As can be seen in the image, interesting application areas for iMUTS interaction concepts include intuitive navigation in large 3D urban models. Of course, the iMUTS setup can be useful in various other domains, too. Manipulating or deforming volumetric datasets in a medical imaging context is just one of several possible application domains.

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PROWIT – Web 2.0 in business processes

Internet-based communication and collaboration services and, especially, Web 2.0 applications promise significant potential in the area of business process management. In the research project PROWIT (process-oriented Web 2.0-based integrated telecommunications service), various collaborative communication technologies are being integrated on the basis of a process collaboration platform (PCP), which is a powerful tool in facilitating the timely communication and exchange of solutions and context-based knowledge among participants in the process. The PCP enables the community to access documented process knowledge and facilitates a collaborative extension of the "process community's" knowledge base. Integrated software and hardware sensors, e.g., in intelligent mobile phones, permit the automatic assessment of relevant information and, in this way, support communications adapted to the individual situation, while taking into account the currently preferred communication medium of the respective players in the process.

The application scenarios used to develop and test the PCP in project PROWIT are based on supply chain management (SCM), hybrid value creation, and IT service management, which ensures the versatility of the PCP in various contexts. Further benefit is added by the selection and use of out-of-plant application scenarios.

One of the application scenarios in the area of SCM is the Vendor Managed Inventory (VMI) method. VMI is an extremely dynamic means of optimizing the performance of the supply chain and requires intensive communication across companies. The dynamics and enhanced need for communication in this area ground on the very nature of the concept, which may demand flexible adjustments to delivery and storage quantities, and which also bears the supply risks of just-in-time deliveries. To this extent, the PCP provides interesting options for the optimal design of process-related communication:

▶ Key data for cooperation with the suppliers is updated in Wikis and particularly important content can be found rapidly using social tagging and bookmarking functions
▶ Questions of responsibility are documented within the process community
▶ The escalation of supply problems proceeds in a timely and context-based manner as a result of integrated communication technologies such as VoIP, Instant Messaging, or mobile systems.

The PROWIT project started in January 2009 and is planned to run for three years. The Federal Ministry of Education and Research (BMBF) provides the funding with the number FKZ 01BS0833.

More information
http://iwi.dfki.de
http://prowit-projekt.de

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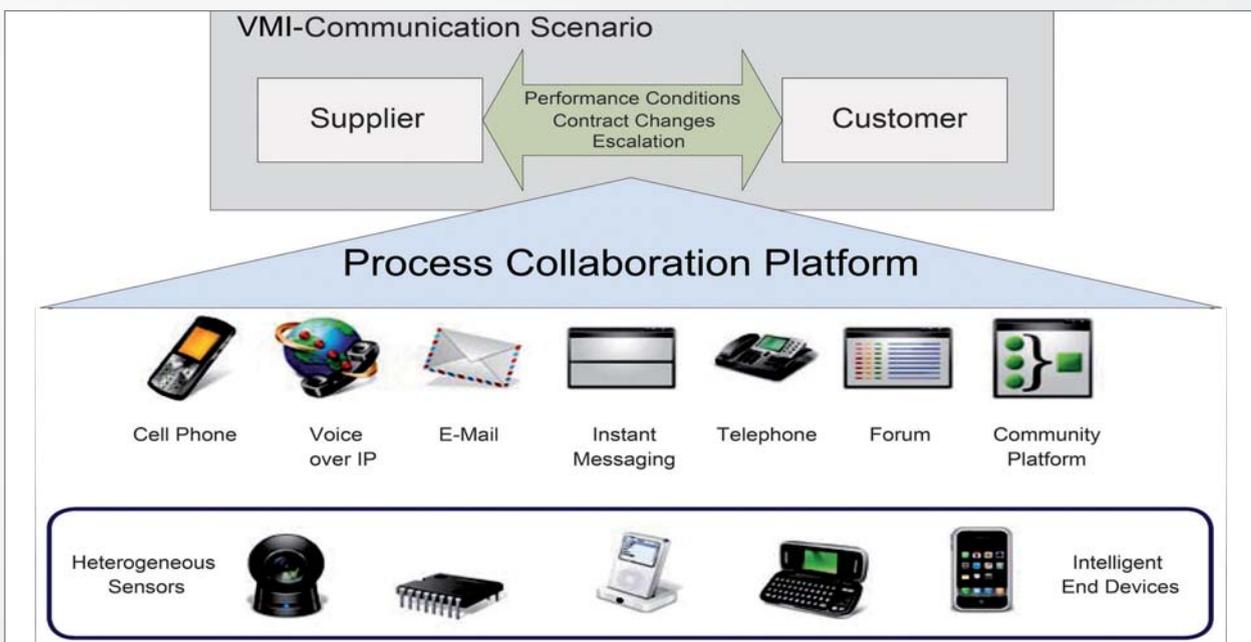
Innovative logistics controlling with SmartTruck

The initial testing of an entirely new generation of delivery vehicles was successfully completed under Project SmartTruck on June 30, 2009. The early results are positive based on the success of the DHL test vehicles in the pick-up and delivery processes of DHL Express in productive operations in Berlin over a three-month pilot phase.

The pilot phase got underway in Berlin in March 2009 and was extended beyond the terms of the SmartTruck research project grant, in order to allow the successful results to become an integral part of the daily operations and to provide the time needed for the solutions to mature. Additional routes in Berlin are to be added gradually over time in order to advance SmartTruck, step by step, closer to the market.

The aim of the SmartTruck project is to achieve a more efficient and transparent control over the logistics processes, from sender to receiver, by taking all data into account. For the first time, real time traffic data is included in the delivery process in the city centers so that an alternative response to interruptions and temporary detours can be determined flexibly and at optimal cost. That's how the best possible customer service can be achieved through improved transparency and rates of on-time delivery. Innovative technologies are expected to provide not only a commercial advantage, but also a reduction of the carbon footprint (CO_2 emissions), which means a significant contribution to climate protection.

The innovative system for vehicle control and scheduling has been developed by DFKI. Modern technologies like GPS and RFID facilitate the recording of current positioning data and load status of the delivery vehicles, in addition to tracking the order book and traffic situation. This data is then used in a flexible and dynamic calculation of routes for individual vehicles and enables optimal route planning. DFKI is able to take advantage of its experience with the integration of complex information systems. "SmartTruck employs the latest technologies in process controlling, combined with dynamic route planning, RFID-aided load detection, and traffic reporting", says Dr. Dirk Werth, head of the Business Integration Technologies project group of the Institute for Information Systems (IWi) at DFKI. "This creates a whole new range of possibilities in the control of freight traffic", continues Werth. In addition to supporting the specification of requirements, DFKI provides project assistance in the design of new forms of business processes, test management and pilot validation.

Partnering with Deutsche Post (DHL) and DFKI on Project SmartTruck are: German Aerospace Center (DLR), Motorola, and Quintiq. The project is supported by the Federal Ministry of Economics and Technology (BMWi) under the framework of its research funding program "Intelligent logistics in commercial freight traffic – Innovation offensive for the markets of tomorrow".

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▶ Multi-signature product passes IT security evaluation

The IT Security Testing Center at DFKI completed its evaluation of the multi-signature product "AuthentiDate SLM Base Component V3.0.20" in August 2009. The tested object passed this comprehensive evaluation based on the international Common Criteria for IT Security Evaluation standard. The successful conclusion of the evaluation is a basic prerequisite for the certification of security properties in conformance with the requirements of the official electronic signature regulations. The product can now be used as a signature application component for the creation and evaluation of qualified electronic signatures in batch operations (multi-signatures). The possible application areas include automated invoicing processes or mass document recording.

The completion of this evaluation by the IT Security Testing Center further confirms and expands its competence in the area of digital signature product testing. Several multifunction terminals for the electronic health card (eGK) are currently undergoing evaluation.

Terminals of this kind are of major importance in the secure creation of qualified electronic signatures. In addition, the IT Security Testing Center also evaluates innovative products from other sectors. A product for online voting is currently undergoing the IT security analysis. This marks the first time worldwide that a software product of this type was evaluated on the basis of the Common Criteria (CC).

More information
www.dfki.de/pits

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▶ DFKI-Interview: Alain Pagani

Alain Pagani is the head of the Computer Vision research team of the Augmented Vision department. After completing his studies in information science, he worked as a researcher at the Fraunhofer Institute for Computer Graphics Research (IGD) in Darmstadt before joining DFKI in 2008.

Alain Pagani

What do you see as the application potentials in your research?
There is an increasing trend towards exchanging photographs and videos as sources of information, and almost anyone can now generate image material. Research in image analysis can result in benefit for people in their daily lives.

When did your interest in artificial intelligence begin and how have AI processes changed since that time?
As a university student I used webcams for image based virtual interaction. Since that time the image quality improved, and so has the level of abstraction in the processes: Today, adaptive algorithms are being developed, abstract models are being used for object recognition, and multiple sensors are being used in the analysis of complex situations.

What are the challenges and opportunities for AI systems today?
Machines can only deliver satisfactory results in image understanding under well-defined conditions. The challenges are to be found in the development of generic methods.

What do you enjoy doing besides working as a research scientist?
Long distance running for me is a pleasant chargeback to balance my work. Also, I have gained a lot of stage experience as a member of a theater group; but over the last few years, my greatest enjoyment comes from my role as a young father on the family stage.

Do you see any parallels to your professional life in this regard?
In theater we can clearly see how light and movement alone can be used to represent complex relationships. In a similar manner, images may contain much more than a collection of colored pixels.

What are your current projects?
I head the CAPTURE project, which is focused on the reconstruction of large objects and scenes from high-resolution spherical image sources. Additionally, I contribute to the AVILUSplus project funded by the Federal Ministry of Education and Research.

News in Brief

INNOVATIVE RETAIL LAB FORUM STARTS OCTOBER 2009

DFKI's Innovative Retail Laboratory (IRL) has prepared a new lecture series – the IRL Forum – for the winter semester 2009/2010. The forum will address the topic of "AI in Commerce" and will primarily be held on Tuesdays from 4:15 p.m. to 5:45 p.m. at DFKI Saarbrücken. Guest lecturers will include experts from various fields of study, for example, design, robotics, human-computer interaction, healthcare and behavioral sciences. The public forum is intended not only for a broad audience of specialists but also especially for students in the information systems curriculum. Current research issues will be introduced and discussed along with study reports having a practical relevance. The diverse areas of application and the challenges facing modern information systems in commerce and trade, logistics, and manufacturing will be comprehensively addressed.

More information and current schedule
www.dfki.de/irl

ROBOTICS INNOVATION CENTER AT THE FIRST NATIONAL SPACE ROBOTICS CONFERENCE

The German Aerospace Center (DLR) organized the "First National Space Robotics Conference" at the Federal Ministry of Economics and Technology (BMWi) on May 13 and 14, 2009 under the auspices of the Federal Minister of Economics and Technology. The conference served as a joint declaration by BMWi and DLR for the official start of the new research focus "Robotics in Space" within the national space program. The Robotics Innovation Center (RIC) under the management of Prof. Frank Kirchner, together with the EADS Astrium Space Transportation and OHB Systems, presented the LUNARES project. LUNARES is a demonstrator and advanced development project for already existing robotic system technologies. The aim is to facilitate the exploration of areas on the lunar surface (e.g. craters) that are of special interest to science but are difficult to access. In the context of the conference, Prof. Frank Kirchner managed the lecture series on fundamental research.

BRONZE MEDAL FOR BREMEN'S UNDERWATER VEHICLE

Team AVALON made an impressive showing at the Student Autonomous Underwater Challenge Europe (SAUC-E) 2009 held in Gosport, England in July 2009. Eight student teams from Great Britain, France, and Germany entered their autonomous underwater vehicles (AUV) in the competition, which is jointly sponsored by the British and French Ministries of Defense. Competing at this event for the first time, the Bremen AUV AVALON Team earned an formidable third place with support from the Robotics Innovation Center and researchers under the direction of Prof. Dr. Frank Kirchner.

What is unique about this competition is the fact that the robots are left to act on their own. They are completely autonomous: no communication is allowed with the robot during the missions. The AUV AVALON is a whole new design by the student team from Bremen and, in addition to its streamlined form, it is very maneuverable because of the positioning of the propellers. The primary strength of the Bremen AUV is the laser light section method technology.

ENVIRONMENTAL INFORMATICS PRIZE FOR RESEARCH DEPARTEMENT KNOWLEDGE MANAGEMENT

The project "CRUV – Collaborative Route-Planning System for Utility Vehicles Enabling Efficient Resource Planning" earned Fabian Fichter of the DFKI Knowledge Management Department a 1st place in the Environmental Informatics Awards 2009, sponsored by the Society for Information Sciences (Gesellschaft für Informatik, GI). The award is endowed with € 1200, donated by the Institute for Environmental Informatics (IfU) in Hamburg.

TILL MOSSAKOWSKI ELECTED AS CHAIRMAN OF IFIP

The International Federation for Information Processing (IFIP) announced in July the election of PD Dr. Till Mossakowski, senior researcher at the Safe and Secure Cognitive Systems Group at DFKI, to serve as chairman of the Working Group Foundations of System Specification (WG 1.3).

The working group studies the formal and mathematical methods used in hardware and software systems modeling with the aim of supporting and promoting the systematic development of the fundamental theory of systems specification. The research activities focus especially on the specification, development, transformation, and verification of systems.

Dr. Till Mossakowski

IFIP was established in 1960 under the auspices of UNESCO and is the leading international organization in the field of information technology. It is recognized by the United Nations and other world bodies, represents IT societies from 56 countries, and has a total membership of over half a million working on all continents.

Publications

A SELECTION OF THE RECENT SCIENTIFIC PUBLICATIONS OF DFKI'S EMPLOYEES

A. Abecker; L. van Elst
Ontologies for Knowledge Management. In: S. Staab; R. Studer (Eds.). Handbook on Ontologies. Pages 713–734, Springer, 2009.

B. Adrian; B. Forcher; T. Roth-Berghofer; A. Dengel
Explaining Ontology-Based Information Extraction in the NEPOMUK Semantic Desktop. In: T. Roth-Berghofer; N. Tintarev; D. B. Leake (Eds.). Workshop 10@IJCAI-09: Explanation-aware Computing (ExaCt 2009). International Joint Conference on Artificial Intelligence (IJCAI-09), July 11–12, Pasadena, California, United States, Pages 94–101, AAAI, 2009.

B. Adrian; H. Maus; A. Dengel
iDocument: Using Ontologies for Extracting Information from Text. WM2009: 5th Conference on Professional Knowledge Management, Lecture Notes in Informatics (LNI), 2009.

B. Adrian; H. Maus; M. Kiesel; A. Dengel
Towards Ontology-based Information Extraction and Annotation of Paper Documents for Personalized Knowledge Acquisition. In: K. Hinkelmann; H. Wache (Eds.). WM2009: 5th Conference on Professional Knowledge Management. March 25–27, Solothurn, Switzerland, Lecture Notes in Informatics (LNI), Vol. P-145, Gesellschaft für Informatik, 2009.

E. Alkassar; M. Hillebrand; D. Leinenbach; N. Schirmer; A. Starostin; A. Tsyban
Balancing the Load: Leveraging a Semantics Stack for Systems Verification. In: Journal of Automated Reasoning (JAR), Vol. 42, No. 2-4, Pages 389–454, Springer, 2009.

S. Autexier; D. Dietrich
Atomic Metadeduction. In: B. Mertsching (Ed.). Proceedings of the 32nd Annual German Conference on Artificial Intelligence (KI-09), September 15–18, Paderborn, Germany, LNCS, Springer, 2009.

C. Barbu; A. Kröner
Customizing the Building and Exploitation of an Event-Based Digital Memory. In: S. Berkovsky; F. Carmagnola; D. Heckmann; T. Kuflik (Eds.). Proceedings of the 7th International Workshop on Ubiquitous User Modelling. Ubiquitous User Modeling (UbiqUM-09), located at User Modeling, Adaptation, and Personalization, June 22, Trento, Italy, Pages 33–36, 2009.

S. Below; T. Diekhof; J. Possin; J. Schöning; M. Kritzler; A. Krüger
GeoInformationRouter – Localization in WLAN Environments Via Infrastructure. In: Ubicomp 2009: Adjunct Proceedings of the 11th International Conference on Ubiquitous Computing. 2009.

C. Bergatt; J. H. Metzen; E. Kirchner; F. Kirchner
Quantification and Minimization of the Simulation-Reality-Gap on a BRIO Labyrinth Game. In: Proceedngs of the first International Workshop on Learning and Data Mining for Robotics. First International Workshop on Learning and Data Mining for Robotics (LEMIR-09), September 7–11, Bled, Slovenia, 2009.

J. van Beusekom; F. Shafait; T. Breuel
Automatic Line Orientation Measurement for Questioned Document Examination. In: Z. J. M. H. Geradts; K. Franke; C. J. Veenman (Eds.). Proceedings of the 3rd International Workshop on Computational Forensics, IWCF 2009 (IWCF-09), Den Haag, Netherlands, Pages 165–173, Springer, 2009.

R. Biedert; G. Buscher; A. Dengel
The Eye Book. In: Informatik Spektrum, Springer, 2009.

G. Bleser
Towards Visual-Inertial SLAM for Mobile Augmented Reality, Dr. Hut, München, 2009.

G. Bleser; D. Stricker
Advanced tracking through efficient image processing and visual-inertial sensor fusion. In: J. Jorge; A. Steed (Eds.). Computer & Graphics (C&G), Vol. 33, Pages 59–72, Elsevier, 2009.

D. Borth; J. Hees; M. Koch; A. Ulges; C. Schulze; T. Breuel; R. Paredes
TubeFiler – an Automatic Web Video Categorizer. In: ACM (Ed.). ACM Mutimedia. ACM International Conference on Multimedia (ACM MM), October 19–24, Beijing, China, ACM, 2009.

D. Borth; A. Ulges; C. Schulze; T. Breuel
Video Copy Detection providing Localized Matches. In: GI. e.V. (Ed.). GI-Informatiktage 2009. March 19–20, Bonn, Germany, Gesellschaft für Informatik e.V. 2009.

K. Breiner; D. Görlich; O. Maschino; G. Meixner
Automatische Generierung voll funktionsfähiger mobiler Bediensoftware aus Benutzungs- und Funktionsmodellen. In: Proceedings of Informatik 2009 – Im Focus das Leben, September 28 – October 2, Lübeck, Germany, LNI, Springer, 2009.

K. Breiner; O. Maschino; D. Görlich; G. Meixner
Towards automatically interfacing application services integrated in a automated model based user interface generation process. In: G. Meixner; D. Görlich; K. Breiner; H. Hußmann; A. Pleuß; S. Sauer; J. V. d. Bergh (Eds.). 4th International Workshop on Model Driven Development of Advanced User Interfaces (MDDAUI–2009), February 8, Sanibel Island, Florida, United States, CEUR Workshop Proceedings, ISSN 1613-0073, Vol. 439, CEUR Workshop Proceedings (Online), 2/2009.

K. Breiner; O. Maschino; D. Görlich; G. Meixner; D. Zühlke
Run-Time Adaptation of a Universal User Interface for Ambient Intelligent Production Environments. In: Proceedings of the 13th International Conference on Human-Computer Interaction (HCII-09), July 19–24, San Diego, CA, United States, Pages 663–672, LNCS, Vol. 5613, Springer, 2009.

G. Buscher; E. Cutrell; M. R. Morris
What do you see when you're surfing? using eye tracking to predict salient regions of web pages. In: CHI '09: Proceedings of the 27th international conference on human factors in computing systems (CHI-09), April 4–9, Boston, Massachusetts, United States, Pages 21–30, ACM, 2009.

G. Buscher; A. Dengel
Gaze-Based Filtering of Relevant Document Segments. In: Workshop on Web Search Result Summarization and Presentation. Workshop on Web Search Result Summarization and Presentation (WSSP-2009), in conjunction with WWW '09 18th International World Wide Web Conference, April 20–24, Madrid, Spain, 2009.

G. Buscher; L. van Elst; A. Dengel
Segment-level display time as implicit feedback: a comparison to eye tracking. In: SIGIR '09: Proceedings of the 32nd international ACM SIGIR conference on Research and development in information retrieval. New York, NY, USA, Pages 67–74, ACM, 2009.

A. Butz; A. Krüger
Smart Graphics. In: IT – information technology, Vol. 51, Pages 129–130, Smart Graphics, Oldenbourg, 2009.

Y. Chen; M. Jellinghaus; A. Eisele; Y. Zhang; S. Hunsicker; S. Theison; C. Federmann; H. Uszkoreit
Combining Multi-Engine Translations with Moses. In: Proceedings of the 4th Workshop on Statistical Machine Translation (EACL-09), located at 12th Conference of the European Chapter of the Association for Computational Linguistics, March 30 – April 3, Athens, Greece, Pages 42–46, Association for Computational Linguistics, 2009.

Y. Chen; M. Kay; A. Eisele
Intersecting Multilingual Data for Faster and Better Statistical Translations. In: Proceedings of Human Language Technologies: The 2009 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL HLT-2009), May 31 – June 5, Boulder, Colorado, United States, Pages 128–136, Association for Computational Linguistics, 2009.

X. Cheng; P. Adolphs; F. Xu; H. Uszkoreit; H. Li
Gossip Galore: A Self-Learning Agent for Exchanging Pop Trivia. In: J. Kreutel (Ed.). Proceedings of the Demonstrations Session at EACL 2009. 12th Conference of the European Chapter of the Association for Computational Linguistics (EACL-2009), March 30 – April 3, Athens, Greece, Association for Computational Linguistics, 2009.

E. Cohen; M. Dahlweid; M. Hillebrand; D. Leinenbach; M. Moskal; T. Santen; W. Schulte; S. Tobies
VCC: A Practical System for Verifying Concurrent C. In: S. Berghofer; T. Nipkow; C. Urban; M. Wenzel (Eds.). Theorem Proving in Higher Order Logics. TPHOLs-09, in Conjunction with 22nd International Conference, August 17–20, Munich, Germany, Pages 23–42, Lecture Notes in Computer Science (LNCS), Vol. 5674, Springer, 2009.

F. Cordes; S. Planthaber; I. Ahrns; T. Birnschein; S. Bartsch; F. Kirchner
Cooperating Reconfigurable Robots for Autonomous Planetary Sample Return Missions. In: ASME/IFToMM International Conference on Reconfigurable Mechanisms and Robots. ASME/IFToMM International Conference on Reconfigurable Mechanisms and Robots (ReMAR-2009), June 22–24, London, United Kingdom, 2009.

M. Crocker, J. Siekmann (Eds.)
Ressource Adaptive Cognitive Processes. Series: Cognitive Technologies. Springer, 2009.

F. Daiber; J. Schöning; A. Krüger
Whole Body Interaction with Geospatial Data. In: A. Butz; B. Fisher; M. Christie (Eds.). Smart Graphics. Spain, Pages 81–92, Vol. 5531/2009, Springer, 2009.

E. Deines; F. Michel; M. Hering-Bertram; J. Mohring; H. Hagen
Simulation and Visualization of Indoor Acoustics Using Phonon Tracing. In: G. Steinebach; S. Guhathakurta; H. Hagen (Eds.). Visualizing Sustainable Planning. Pages 147–156, Springer, 2009.

M. Deller; S. Thelen; D. Steffen; P.-S. Olech; A. Ebert; J. Malburg; J. Meyer
A Highly Scalable Rendering Framework for Arbitrary Display and Display-in-Display Configurations. In: H. R. Arabnia; L. Deligiannidis; (. E. A. M. G. Solo (Eds.). Proceedings of the 2009 International Conference on Computer Graphics & Virtual Reality (CGVR-2009), located at WorldComp'09, July 13–16, Las Vegas, NV, United States, Pages 164–170, CSREA Press, USA, 2009.

G. Dinu; R. Wang
Inference Rules for Recognizing Textual Entailment. In: H. Bunt; V. Petukhova; S. Wubben (Eds.). Proceedings of the IWCS-8. Eighth International Conference on Computational Semantics, January 7–9, Tilburg, Netherlands, Pages 90–103, 2009.

G. Dinu; R. Wang
Inference Rules and their Application to Recognizing Textual Entailment. In: Proceedings of the EACL 2009. 12th Conference of the European Chapter of the Association for Computational Linguistics (EACL-09), March 30 – April 3, Athens, Greece, Association for Computational Linguistics, 2009.

T. Dollmann; M. Fellmann; O. Thomas; P. Loos; A. Hoheisel; P. Katranuschkov; R. J. Scherer
Process-Oriented Collaboration in Grid-Environments: A Case Study in the Construction Industry. In: Proceedings of the 15th Americas Conference on Information Systems (AMCIS-2009), August 6–9, San Francisco, CA, United States, 2009.

M. Duan; A. Ulges; T. Breuel; X.-Q. Wu
Style Modeling for Tagging Personal Photo Collections. In: Proceedings Int. Conf. Image and Video Retrieval (CIVR-09), ACM, New York, US, 2009.

A. Ebert; P. Dannenmann
Human-Computer Interaction and Visualization – Workshopbeiträge. In: J. Münch; P. Liggesmeyer (Eds.). Software Engineering 2009 – Workshopband. Software Engineering 2009 (SE-09), March 2–6, Kaiserslautern, Germany, Pages 143–145, Lecture Notes in Informatics (LNI), Vol. P-150, Köllen Druck + Verlag GmbH, 2009.

A. Ebert; M. Deller; D. Steffen; M. Heintz
"Where Did I Put That?" – Effectiveness of Kinesthetic Memory in Immersive Virtual Environments. In: C. Stephanidis (Ed.). Universal Access in Human-Computer Interaction. Applications and Services. 5th International Conference on Universal Access in Human-Computer Interaction – Addressing Diversity (UAHCI-2009), July 19–24, San Diego, CA, United States, Pages 179–188, Lecture Notes in Computer Science (LNCS), Vol. III, No. 5616, Springer, 2009.

M. Eich; F. Grimminger; F. Kirchner
Adaptive Compliance Control of a Multi-legged Stair-Climbing Robot Based on Proprioceptive Data. In: Industrial Robot: An International Journal, Vol. 36 Issue 4, Pages 331–339, Emerald Group Publishing Limited, 2009.

J. Exeler; J. Müller; M. Buzeck; A. Krüger
ReflectiveSigns: Digital Signs That Adapt to Audience Attention. In: Pervasive 2009. May 11–14, Nara, Japan, Pages 17–24, Vol. 5538/2009, Springer, 2009.

C. Federmann; S. Theison; A. Eisele; H. Uszkoreit; Y. Chen; M. Jellinghaus; S. Hunsicker
Translation Combination using Factored Word Substitution. In: Proceedings of the Fourth Workshop on Statistical Machine Translation. 12th Conference of the European Chapter of the Association for Computational Linguistics (EACL-09), March 30 – April 3, Athens, Greece, Greece, Pages 70–74, Association for Computational Linguistics, 2009.

M. Fellmann; O. Thomas; T. Dollmann
Documenting Models and their Relations with Semantic Wikis. In: Proceedings of the AAAI 2009 Spring Symposium on Social Semantic Web: Where Web 2.0 meets Web 3.0, March 23–25, Stanford, California, United States, Pages 17–18, AAAI Press, 2009.

A. Figueroa
Finding Answers to Definition Questions across the Spanish Web. WWW'09: Iberoamerica an Alternate Track, 4/2009.

A. Figueroa; J. Atkinson
Using Dependency Paths For Answering Definition Questions on The Web. In: Proceedings of the 5th International Conference on Web Information Systems and Technologies (WEBIST-09), March 23–26, Lissabon, Portugal, Pages 643–650, INSTICC Press, 2009.

M. Folgheraiter; B. Bongardt; S. Schmidt; J. de Gea Fernández; J. Albiez; F. Kirchner
Design of an Arm Exoskeleton using an hybrid Motion-Capture and Model-Based Technique. In: IEEE International Conference on Robotics and Automation. IEEE International Conference on Robotics and Automation (ICRA-2009), May 12–17, Kobe, Japan, 2009.

M. Folgheraiter; J. de Gea Fernández; B. Bongardt; J. Albiez; F. Kirchner
Bio-inspired control of an arm exoskeleton joint with active-compliant actuation system. In: Applied Bionics and Biomechanics, Vol. 6, No. 2, Pages 193–204, Taylor & Francis, 2009.

B. Forcher; M. Möller; M. Sintek; T. Roth-Berghofer
Explanation of Semantic Search Results of Medical Images in MEDICO. In: T. Roth-Berghofer; N. Tintarev; D. B. Leake (Eds.). Workshop 10@IJCAI-09: Explanation-aware Computing (ExaCt 2009). International Joint Conference on Artificial Intelligence (IJCAI-09), July 11–12, Pasadena, California, United States, Pages 13–24, AAAI, 2009.

M. Feld; C. Müller
An Integrated Development Environment for Speech-Based Classification. In: Proceedings of the 13th International Conference "Speech and Computer" SPECOM 2009. Speech and Computer 2009 (SPECOM-09), June 21–25, St. Petersburg, Russian Federation, Pages 443–447, St. Petersburg State University of Aerospace Instrumentation, 2009.

J. Frey; M. Kopf; M. Krauter
Modellgetriebene Architekturvalidierung mit Eclipse & Co. In: www.heise.de/developer, Vol. X, Pages 1–5, heise Developer, 2009.

J. de Gea Fernández; J. Lemburg; T. Röhr; M. Wirkus; I. Gurov; F. Kirchner
Design and Control of an Intelligent Dual-Arm Manipulator for Fault-Recovery in a Production Scenario. In: IEEE Conference on Emerging Technologies and Factory Automation. IEEE Conference on Emerging Technologies and Factory Automation (ETFA-09), September 22–26, Mallorca, Spain, 2009.

J. de Gea Fernández; Y. Kassahun; F. Kirchner
Control of Robot Interaction Forces Using Evolutionary Techniques. In: Factory Automation.

T. Gerber
Digital SmartFactoryKL: Approach of a flexible digital model based on real-time states. In: T. Gerber; F. Flörchinger; A. Muntean (Eds.). Digital SmartFactoryKL: Approach of a flexible digital model based on real-time states. International Conference on Manufacturing Science and Education (MSE –2009), June 4–6, Sibiu, Romania, Review of Management and Economical Engineering, 2009.

L. E. Gerharz; A. Krüger; O. Klemm
Applying indoor and outdoor modeling techniques to estimate individual exposure to PM2.5 from personal GPS profiles and diaries: a pilot study. In: Science of The Total Environment, Vol. 407, No. 18, Pages 5184–5193, Elsevier, 2009.

M. Goldstein; M. Reif; A. Stahl; T. Breuel
Server-side Prediction of Source IP Addresses using Density Estimation. In: Availability, Reliability and Security, 2009. ARES 09. The 4th International Conference on Availability, Reliability and Security (ARES–2009), In Conjunction with ARES – The International Dependability Conference, March 16–19, Fukuoka, Japan, Pages 82–89, IEEE Computer Society Press, 3/2009.

D. Görlich
Laufzeit-Adaption von Benutzungsschnittstellen für Ambient-Intelligence-Umgebungen mittels Raumbasierter Benutzungsmodelle. PhD-Thesis, Fachbereich Maschinenbau und Verfahrenstechnik, TU Kaiserslautern, Fortschritt-Berichte pak (ISSN 1439-8109), Vol. 20, Technische Universität Kaiserslautern, 5/2009.

A. Graves; M. Liwicki; S. Fernández; R. Bertolami; H. Bunke; J. Schmidhuber
A Novel Connectionist System for Unconstrained Handwriting Recognition. In: IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 31, No. 5, Pages 855–868, IEEE Computer Society, Los Alamitos, CA, USA, 2009.

G. v. Grootel; P. Spyns; S. Christiaens; B. Jörg; et al.
Business Semantics Management supports government innovation information portal. OnTheMove Federated Conferences & Workshops (OTM-09), in conjunction with OnTheMove to Meaningful Internet Systems and Ubiquitous Computing, November 1–6, Algarve, Portugal, Lecture Notes Computer Science (LNCS), Springer, Heidelberg, 2009.

C. Hahn; C. Madrigal Mora; K. Fischer
A platform-independent metamodel for multiagent systems. In: Autonomous Agents and Multi-Agent Systems, Vol. 18, No. 2, Pages 239–266, Springer Netherlands, 2009.

N. Hawes; H. Zender; K. Sjöö; M. Brenner; G. J. Kruijff; P. Jensfelt
Planning and Acting with an Integrated Sense of Space. In: Proceedings of the International Workshop on Hybrid Control of Autonomous Systems (HYCAS-09), in Conjunction with Integrating Learning, Deliberation and Reactive Control, located at IJCAI-09, July 11–17, Pasadena, CA, United States, 2009.

D. Heckmann; M. Loskyll; R. Math; P. Recktenwald; C. Stahl
UbisWorld 3.0: a semantic Tool Set for Ubiquitous User Modeling. In: User Modeling, Adaptation, and Personalization, Demos. UMAP-2009, 2009.

M. Hildebrandt; J. Kerdels; J. Albiez; F. Kirchner
A Multi-Layered Controller Approach for High Precision End-Effector Control of Hydraulic Underwater Manipulator Systems. In: OCEANS 09 MTS / IEEE Biloxi. OCEANS 09 MTS / IEEE Biloxi (OCEANS-09), in Conjunction with Marine Technology for our Future: Global and Local Challenges, October 26-29, Biloxi, United States, 2009.

M. Hillebrand; S. Tverdyshev
Formal Verification of Gate-Level Computer Systems. In: A. Frid; A. Morozov; A. Rybalchenko; K. W. Wagner (Eds.). Computer Science -- Theory and Applications (CSR-09), in Conjunction with Fourth International Computer Science Symposium in Russia, August 18-23, Novosibirsk, Russian Federation, Pages 322-333, Lecture Notes in Computer Science (LNCS), Vol. 5675, Springer, 2009.

E. Indermühle; M. Liwicki; H. Bunke
Combining Alignment Results for Historical Handwritten Document Analysis. In: Proceedings 10 Int. Conf. Document Analysis and Recognition 2009. ICDAR-09, Barcelona, Spain, Pages 1186-1190, 2009.

O. Jacobs; A. Kröner; M. Schneider
Interaktion mit dem digitalen Gedächtnis einer intelligenten Küche. In: T. Baehren; D. Czogala; C. Gehring; H. Klausing; W. Wahlster (Eds.). Tagungsband des 2. Deutschen AAL-Kongresses. Ambient Assisted Living (AAL-09), January 27-28, Berlin, Germany, VDE-Verlag, Offenbach, 2009

C. Jansohn; A. Ulges; T. Breuel
Detecting Pornographic Video Content by Combining Image Features with Motion Information. In: Proceedings Int. Conf. on Multimedia. ACM, 10/2009.

B. Jörg
CERIF: Common European Research Information Format - Formal Contextual Relations to guide through the maze of Research Information. International Conference Research Information Systems in the EU, in Conjunction with Standardization and Compatibility, April 23, Bratislava, Slovakia, Centrum vedecko-technických informácií SR, Bratislava, 6/2009.

B. Jörg
CERIF: The Common European Research Information Format Model. In: A. A. K. Jeffery (Ed.). Data Science Journal (DSJ), Vol. CRISs for European e-Infrastructure, CODATA, 75016 Paris, France, 2009.

G. Kahl; K. Leichtenstern; J. Schöning; L. Spassova; A. Krüger
Contextual Learning Game for Toddlers Installed on an Interactive Display Attached to a Shopping Cart. In: PerED 2009: Workshop in adjunction with the 11th International Conference on Ubiquitous Computing, 2009.

Y. Kassahun; J. Schwendner; J. de Gea Fernandez; M. Edgington; F. Kirchner
Learning Complex Robot Control Using Evolutionary Behavior Based Systems. In: Genetic and Evolutionary Computation Conference 2009. Genetic and Evolutionary Computation Conference 2009 (GECCO-2009), July 8-12, Montréal, Canada, 2009.

S.-Y. Kim; Y. Kim; Y.-H. Yoo
A unified energy-based haptic model for a non-rigid object. In: Electronics Express (IEICE), Vol. 6, Pages 382-388, Tokyo Institute of Technology, 2009.

M. Klinkigt; K. Kise; H. Maus; A. Dengel
Object Detection in Images With Cluttered Background by Using Local Features and Their Configuration. Institute of Electronics, Information and Communication Engineers (IEICE), Proceedings of Technical Committee on Pattern Recognition and Media Understanding (PRMU), Vol. 109, 2009.

M. Klinkigt; H. Maus; K. Kise; A. Dengel
Automatic Management of Large Images Databases. In: International Conference on Multimedia, Information Technology and its Applications. MITA-09, August 19-21, Osaka, Japan, 2009.

A. Kohlhase; M. Kohlhase
Compensating the Computational Bias of Spreadsheets with MKM Techniques. In: J. Carette; L. Dixon; C. S. Coen; S. M. Watt (Eds.). MKM/Calculemus 2009 Proceedings. Mathematical Knowledge Management (MKM-09), located at CICM-09, Grand Bend, Ontario, Canada, Pages 357-372, LNAI, No. 5625, Springer, 2009.

A. Kohlhase; M. Kohlhase
Modeling Task Experience in User Assistance Systems. In: Proceedings of the 27th annual ACM international conference on Design of communication. Special Interest Group on Design of Communication (SIGDOC-09), Bloomington, IN, United States, ACM Press, 2009.

A. Kohlhase; M. Kohlhase
Semantic Transparency in User Assistance Systems. In: Proceedings of the 27th annual ACM international conference on Design of Communication. Special Interest Group on Design of Communication (SIGDOC-09), Bloomington, IN, United States, ACM Press, 2009.

A. Kohlhase; M. Kohlhase
Spreadsheet Interaction with Frames: Exploring a Mathematical Practice. In: J. Carette; L. Dixon; C. S. Coen; S. M. Watt (Eds.). MKM/Calculemus 2009 Proceedings. Mathematical Knowledge Management (MKM-09), located at CICM, Grand Bend, Ontario, Canada, Pages 341-256, Lecture Notes of Artificial Intelligence (LNAI), No. 5625, Springer Verlag, 2009.

A. Kohlhase; M. Kohlhase
What you get is what you understand: Assessment in SACHS. In: Wissens- und Erfahrungsmanagement: LWA (Lernen, Wissensentdeckung und Adaptivität) Conference Proceedings. FGWM-09, located at LWA (Lernen, Wissensentdeckung und Adaptivität), Darmstadt, Germany, TU Darmstadt, 2009.

B. Krieg-Brückner; H. Shi; C. Fischer; T. Röfer; C. Jian; K. Schill
Welche Sicherheitsassistenz brauchen Rollstuhlfahrer? In: 2. Deutscher AAL-Kongress 2009. Berlin, Germany, VDE-Verlag; Berlin-Offenbach, Germany, 2009.

M. Kritzler; A. Krüger
Concept of a Framework for Moving Objects based on different Data Sources. In: W. Reinhardt; A. Krüger; M. Ehlers (Eds.). Geoinformatik 2009. March 31 - April 2, Osnabrück, Germany, ifgi Prints, 2009.

A. Kröner
Building, Exploiting, and Sharing Personal Digital Memories in SPECTER and SharedLife. In: J. Kay; B. Kummerfeld (Eds.). Proceedings of the Lifelong User Modelling Workshop (LLUM-09), located at User Modeling Adaptation, and Personalization 2009, June 26, Trento, Italy, Pages 43-45, 2009.

A. Kröner; P. Gebhard; L. Spassova; G. Kahl; M. Schmitz
Informing Customers by Means of Digital Product Memories. In: M. Schneider; A. Kröner; P. Olivier; P. Stephan (Eds.). Proceedings of the 1st international Workshop on Digital Object Memories (DOMe-09), located at Intelligent Environments 2009, July 19, Barcelona, Spain, 2009.

A. Krüger; J. Schöning; M. Löchtefeld; F. Steinicke; M. Rohs
About Two Physical Interaction Metaphors: Narrowing the Gap between the Virtual and the Real Worlds. In: ISUVR 2009: Proceedings of the 7th International Symposium on Ubiquitous Virtual Reality, (2009). Springer, 2009.

A. Krüger; J. Schöning; M. Löchtefeld; F. Steinicke; M. Rohs
About Two Physical Interaction Metaphors: Narrowing the Gap between the Virtual and the Real Worlds. In: Y. Suh; W. Lee (Eds.). 2009 International Symposium on Ubiquitous Virtual Reality. ISUVR-2009, July 8-11, Gwangju, Korea, Republic of, Pages 11-14, IEEE Explore, 2009.

D. Kühn; N. Sauthoff; F. Grimminger; M. Römmermann; F. Kirchner
Towards a Biologically Inspired Ape-Like Robot. In: International Conference on Climbing and Walking Robots and the Support technologies for Mobile Machines. International Conference on Climbing and Walking Robots and the Support technologies for Mobile Machines (CLAWAR-09), September 9-11, Istanbul, Turkey, 2009.

E. León Soto
Modeling Interaction Protocols as Modular 1st Class Objects. In: K. Fischer; J. P. Müller; J. Odell; A. J. Berre (Eds.). Agent-Based Technologies and Applications for Enterprise Interoperability. Chapter 10, Pages 174-198, Lecture Notes in Business Information Processing (LNBIP), Vol. 25, Springer, 2009.

L. Lewejohann; A. M. Hoppmann; P. Kegel; M. Kritzler; A. Krüger; N. Sachser
Behavioral phenotyping of a murine model of Alzheimer's disease in a seminaturalistic environment using RFID tracking. In: Behavior Research Methods, Vol. 40, No. 3, Pages 850-856, The Psychonomic Society, Inc., 2009.

M. Liwicki; H. Bunke
Feature Selection for HMM and BLSTM based Handwriting Recognition of Whiteboard Notes. In: Int. Journal of Pattern Recognition and Artificial Intelligence, Vol. 23, No. 5, Pages 1-16, 2009.

P. Lison
A Method to Improve the Efficiency of Deep Parsers with Incremental Chart Pruning. In: Proceedings of the ESSLLI Workshop on Parsing with Categorial Grammars. Bordeaux, France, European Summer School on Logic, Language and Information, 2009.

P. Lison; G. J. Kruijff
An integrated approach to robust processing of situated spoken dialogue. In: Proceedings of the Second International Workshop on the Semantic Representation of Spoken Language (SRSL 09). Athens, Greece, Association for Computational Linguistics, 2009.

P. Lison; G. J. Kruijff
Efficient Parsing of Spoken Inputs for Human-Robot Interaction. In: Proceedings of the 18th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN 09). Toyama, Japan, IEEE, 2009.

P. Lison; G. J. Kruijff
Robust processing of situated spoken dialogue. In: Proceedings of the 32nd German Conference on Artificial Intelligence (KI 2009). Paderborn, Germany, Springer Lecture Notes in Artificial Intelligence, 2009.

A. Lodwich; Y. Rangoni; T. Breuel
Evaluation of Robustness and Performance of Early Stopping Rules with Multi Layer Perceptrons. In: IJCNN 2009.

International Joint Conference on Neural Networks (IJCNN-09), June 14-19, Atlanta, Georgia, United States, CFP09IJS-CDR, IEEE, 2009.

M. Löchtefeld; J. Schöning; M. Rohs; A. Krüger
LittleProjectedPlanet: An Augmented Reality Game for Camera Projector Phones. In: Mobile HCI 2009: Workshop on Mobile Interaction with the Real World MIRW. 2009.

A. Löffler; M. Repplinger; P. Slusallek
Verteiltes Rendering: Flexible Spezifikation und Konfiguration mittels Multimedia-Middleware. In: 8. Paderborner Workshop Augmented & Virtual Reality in der Produktentstehung. Paderborn, Germany, Pages 79-94, HNI-Verlagsschriften, 2009.

M. Loskyll; D. Heckmann; C. Glahn
Visualization of Spatial Knowledge with Ontology Trees and Adaptable Search Result Grids in the Era of Web 3.0. In: 9th International Conference on Knowledge Management and Knowledge Technologies, 2009.

M. Loskyll; D. Heckmann; I. Kobayashi
UbisEditor 3.0: Collaborative Ontology Development on the Web. In: Web 3.0: Merging Semantic Web and Social Web, Workshop at Hypertext 2009, 2009.

C. Madrigal Mora; K. Fischer
Adding Organisations and Roles to JADE with JadeOrgs. In: K. Fischer; J. P. Müller; J. Odell; A. J. Berre. Agent-Based Technologies and Applications for Enterprise Interoperability. Pages 98-117, Lecture Notes in Business Information Processing (LNBIP), Vol. 25, Springer, 2009.

G. Meixner; D. Görlich
Eine modellbasierte Architektur für den Useware-Engineering Prozess. In: Proceedings of Informatik 2009. Informatik 2009 - Im Focus das Leben, September 28 - October 2, Lübeck, Germany, LNI, Springer, 2009.

G. Meixner; D. Görlich
Eine Taxonomie für Aufgabenmodelle. In: P. Liggesmeyer; G. Engels; J. Münch; J. Dörr; N. Riegel (Eds.). Proceedings of Software Engineering 2009 (SE-09), March 2-6, Kaiserslautern, Germany, GI, 2009.

G. Meixner; D. Görlich; K. Breiner; H. Hußmann; A. Pleuß; S. Sauer; J. V. d. Bergh
4th International Workshop on Model Driven Development of Advanced User Interfaces (MDDAUI). In: C. Conati; M. Bauer; N. Oliver; D. S. Weld (Eds.). Proceedings of the 13th International Conference on Intelligent User Interfaces (IUI-2009), February 8, Sanibel Island, Florida, United States, Pages 503-504, ACM, 2009.

G. Meixner; R. Linn
Controlling Communication Satellites - A Case Study: The User Interface. In: Proceedings of the 27th AIAA International Communication Satellite Systems Conference (ICSSC-09), June 1-4, Edinburg, United Kingdom, AAAI Press, 2009.

G. Meixner; R. Schäfer
Modellbasierte Entwicklung von Benutzungsschnittstellen mit UIML. In: i-com, Vol. 8, No. 1, Pages 60-67, Oldenbourg, 2009.

M. Memmel; M. Kockler; R. Schirru
Providing Multi Source Tag Recommendations in a Social Resource Sharing Platform. In: Journal of Universal Computer Science (jucs), Vol. 15, No. 3, Pages 678-691, Verlag der Technischen Universität Graz and Know-Center Graz, 2009.

G. Meixner; M. Seissler; M. Nahler
Udit: A Graphical Editor For Task Models. In: G. Meixner; D. Görlich; K. Breiner; H. Hußmann; A. Pleuß; S. Sauer; J. V. d. Bergh (Eds.). 4th International Workshop on Model Driven Development of Advanced User Interfaces (MDDAUI-2009), February 8, Sanibel Island, Florida, United States, CEUR Workshop Proceedings, Vol. 439, CEUR Workshop Proceedings (Online), 2009.

J. H. Metzen; E. Kirchner; L. Abdenebaoui; F. Kirchner
The BRIO Labyrinth Game - A Testbed for Reinforcement Learning and for Studies on Sensorimotor Learning. In: Proceedings of the Multidisciplinary Symposium on Reinforcement Learning (MSRL-09), June 18-19, Montreal, Canada, 2009.

J. H. Metzen; E. Kirchner; L. Abdenebaoui; F. Kirchner
Learning to Play the BRIO Labyrinth Game. In: Zeitschrift für Künstliche Intelligenz (Ki), Vol. Themenheft "Reinforcement Learning", Böttcher IT Verlag, 2009.

M. Möller; S. Mukherjee
Context-Driven Ontological Annotations in DICOM Images: Towards Semantic PACS. In: Proceedings of International Joint Conference on Biomedical Engineering Systems and Technologies. BIOSTEC-09, January 14-17, Porto, Portugal, 2009.

M. Möller; S. Regel; M. Sintek
RadSem: Semantic Annotation and Retrieval for Medical Images. In: Proceedings of The 6th Annual European Semantic Web Conference. The 6th Annual European Semantic Web Conference (ESWC-2009), May 31 - June 4, Heraklion, Greece, 2009.

M. Möller; N. Vyas; M. Sintek; S. Regel; S. Mukherjee
Visual Query Construction for Cross-Modal Semantic Retrieval of Medical Information. In: Proceedings of the Malaysian Joint Conference on Artificial Intelligence (MJCAI). Kuala Lumpur, Malaysia, 2009.

M. Möller; C. Folz; M. Sintek; S. Seifert; P. Wennerberg
Extending the Foundational Model of Anatomy with Automatically Acquired Spatial Relations. In: Proceedings of the International Conference on Biomedical Ontologies (ICBO), 2009.

M. Möller; M. Sintek; P. Buitelaar; S. Mukherjee; X. S. Zhou; J. Freund
Scalable Medical Image Understanding by Fusing Cross-Modal Object Recognition with Formal Domain Semantics. In: A. Fred; J. Filipe; H. Gamboa (Eds.). Best papers of BIOSTEC 2008. Biomedical Engineering Systems and Technologies. International Joint Conference (BIOSTEC-2008), Funchal, Madeira, Portugal, Pages 390-401, Communications in Computer and Information Science, Vol. 25, Springer, 2009.

R. Myers; D. Pattinson; L. Schröder
Coalgebraic Hybrid Logic. In: L. d. Alfaro (Ed.). Foundations of Software Science and Computation Structures. FOS-SACS-09, March 22-25, York, United Kingdom, Pages 137-151, Lecture Notes in Computer Science (LNCS), Vol. 5504, Springer, 2009.

J. Neidig; P. Stephan
An Object Memory Modeling Approach for Product Life Cycle Applications. In: Workshop Proceedings of the 5th International Conference on Intelligent Environments. 1st Workshop on Digital Object Memories (DOME-09), located at 5th International Conference on Intelligent Environments, July 20-21, Barcelona, Spain, IOS Press, 2009.

R. Neßelrath; J. Alexandersson
A 3D Gesture Recognition System for Multimodal Dialog Systems. In: Proceedings of the 6th IJCAI Workshop on Knowledge and Reasoning in Practical Dialogue Systems (IJCAI -09), July 12, Pasadena, California, United States, Pages 46-51, IJCAI 2009, 2009.

R. Neßelrath; C. H. Schulz; J. Schehl; A. Pfalzgraf; N. Pfleger; V. Stein; J. Alexandersson
Homogeneous Multimodal Access to the Digital Home for People with Cognitive Disabilities. In: Ambient Assisted Living 2009. 2. Deutscher AAL-Kongress mit Ausstellung / Technologien-Anwendungen (AAL-09), January 27-28, Berlin, Germany, VDE, 2009.

Open Source Jahrbuch e.V (Hrsg.)
Wie wir fühlen werden?! Berlin Open 2009 - Wissen, Vernetzung, Innovation, June 22-23, Berlin, Germany, Berlin Open 2009, Proceedings der Berlin-Open, Vol. Open Source Jahrbuch 2009, Open Source Jahrbuch e.V. Verlag, 2009.

D. Obradovic; S. Baumann
A Journey to the Core of the Blogosphere. In: Proceedings of the International Conference on Advances in Social Network Analysis and Mining (ASONAM 2009). Pages 1-6, IEEE, 2009.

A. Pagani; D. Stricker
Canaux projectifs intégraux pour la mise en correspondance de régions. In: Actes des Journées ORASIS. Congrès des jeunes chercheurs en vision par ordinateur (ORASIS-09), June 8-12, Trégastel, France, 2009.

S. C. Pammi; M. Charfuelan; M. Schröder
Quality control of automatic labelling using HMM-based synthesis. In: Proceedings ICASSP 2009. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP-09), April 19-24, Taipei, Taiwan, 2009.

D. Pattinson; L. Schröder
Generic Modal Cut Elimination Applied to Conditional Logics. In: M. Giese; A. Waaler (Eds.). Automated Reasoning with Analytic Tableaux and Related Methods. TABLEAUX-09, Lecture Notes in Computer Science, Vol. 5607, Springer, 2009.

N. Petersen; D. Stricker
Fast Hand Detection Using Posture Invariant Constraints. In: B. Mertsching (Ed.). KI 2009: Advances in Artificial Intelligence. KI 2009 AI and Automation (KI-2009), in Conjunction with 32nd Annual Conference on Artificial Intelligence, September 15-18, Paderborn, Germany, Lecture Notes in Artificial Intelligence, Springer, Berlin, 2009.

B. Proß; J. Schöning; A. Krüger
iPiccer: Automatically Retrieving and Inferring Tagged Location Information from Web Repositories. In: Mobile HCI 2009: Adjunct Proceedings of the 11th International Conference on Human-Computer Interaction with Mobile Devices and Service. ACM, 2009.

Y. Rangoni; J. van Beusekom; T. Breuel
Language independent thresholding optimization using a Gaussian mixture modelling of the character shapes. In: MOCR '09: Proceedings of the International Workshop on Multilingual OCR. New York, NY, USA, Pages 1-9, ACM, 2009.

G. Reis; J. Köhler; T. Nöll; M. Deller
Multimodal Visualization. In: H. R. Arabnia; L. Deligiannidis; (. E. A. M. G. Solo (Eds.). Proceedings of the 2009 International Conference on Computer Graphics and Virtual Reality (CGVR 09). July 13–16, Las Vegas, NV, United States, WorldComp' 09, CSREA Press, 2009.

M. Repplinger; M. Beyer; P. Slusallek
Multimedia Processing on Many–Core Technologies Using Distributed Multimedia Middleware. In: Proceedings of the 13th International Conference on Internet and Multimedia Systems and Applications (IMSA–09), HI, United States, Pages 99–104, ACTA Press, 2009.

M. Repplinger; A. Löffler; B. Schug; P. Slusallek
Extending X3D for Distributed Multimedia Processing and Control. In: Proceedings of Web3D 2009: The 14th International Conference on Web3D Technology (Web3D Symposium '09), Pages 61–69, ACM Press, 2009.

M. Repplinger; A. Löffler; M. Thielen; P. Slusallek
A Flexible Adaptation Service for Distributed Rendering. In: Proceedings of 9th Eurographics Symposium on Parallel Graphics and Visualization 2009 (EGPGV '09), March 29–30, Munich, Germany, Pages 49–56, Eurographics, 2009.

T. Röfer; T. Laue; O. Bösche; I. Sieverdingbeck; T. Wiedemeyer; J.–H. Worch
B–Human Team Description for RoboCup 2009. In: J. Baltes; M. G. Lagoudakis; T. Naruse; S. Shiry (Eds.). RoboCup 2009: Robot Soccer World Cup XIII Preproceedings. RoboCup Federation, 2009.

T. Röfer; T. Laue; B. Gersdorf
iWalker – An Intelligent Walker providing Services for the Elderly. In: Technically Assisted Rehabilitation 2009. VDe/VDI, 2009.

T. Röfer; C. Mandel; T. Laue
Controlling an Automated Wheelchair via Joystick/Head–Joystick Supported by Smart Driving Assistance. In: Proceedings of the 2009 IEEE 11th International Conference on Rehabilitation Robotics. Pages 743–748, IEEE, 2009.

M. Römmermann; D. Kühn; F. Kirchner
Robot Design for Space Missions using Evolutionary Computation. In: IEEE Congress on Evolutionary Computation. IEEE Congress on Evolutionary Computation (IEEE CEC–2009), May 18–21, Trondheim, Norway, 2009.

M. Rohs; R. Schleicher; J. Schöning; G. Essl; S. Naumann; A. Krüger
Impact of item density on the utility of visual context in magic lens interactions. In: Personal and Ubiquitous Computing (PUC), Vol. 4, Pages 1617–4917, Springer, 7/2009.

M. Rohs; J. Schöning; R. Schleicher; G. Essl; A. Naumann; A. Krüger
Impact of Item Density on Magic Lens Interactions. In: Mobile HCI 2009: Proceedings of the 11th International Conference on Human–Computer Interaction with Mobile Devices and Service. ACM, 2009.

T. Roth–Berghofer; N. Tintarev; D. B. Leake
Proceedings of the IJCAI–09 workshop on Explanation–aware Computing (ExaCt 2009). International Joint Conference on Artificial Intelligence (IJCAI–09), July 11–12, Pasadena, California, United States, AAAI, 2009.

D. Rubinstein; I. Georgiev; B. Schug; P. Slusallek
RTSG: Ray Tracing for X3D via a Flexible Rendering Framework. In: Proceedings of the 14th International Conference on 3D Web Technology 2009 (Web3D Symposium '09), June 16–17, Darmstadt, Germany, ACM, New York, NY, USA, 2009.

A. Sadovykh; C. Hahn; D. Panfilenko; O. Shafiq; A. Limyr
SOA and SHA Tools Developed in SHAPE Project. In: R. Vogel (Ed.). Proceedings of the Tools and Consultancy Track, in Conjunction with Fifth European Conference on Model–Driven Architecture Foundations and Applications (ECMDA–09), June 23–26, Enschede, Netherlands, Page 113, CTIT Proceedings Series (WP), Vol. 09–12, University of Twente, Enschede, 2009.

R. Samperio Melgoza; H. Hu; D. Gu
Implementation of a localization–oriented HRI for walking robots in the RoboCup environment. In: International Journal of Information Acquisition (IJIA), Vol. 5, No. 4, Pages 331–347, World Scientific Publishing Company, 2009.

L. Sauermann
The Gnowsis Semantic Desktop approach to Personal Information Management. PhD–Thesis, Fachbereich Informatik der Universität Kaiserslautern, Dissertation.de, Berlin, 2009.

T. Scheffler; R. Roller; N. Reithinger
Semi–Automatic Creation of Resources for Spoken Dialog Systems. In: B. Mertsching; M. Hund; Z. Aziz (Eds.). KI 2009: Advances in Artificial Intelligence. KI (KI–2009), in Conjunction with 32nd Annual Conference on Artificial Intelligence, September 15–18, Paderborn, Germany, Pages 209–216, Lecture Notes in Artificial Intelligence (LNAI), Vol. 5803, Springer, 2009.

T. Scheffler; R. Roller; N. Reithinger
SpeechEval – Evaluating Spoken Dialog Systems by User Simulation. In: A. Jönsson; J. Alexandersson; D. Traum; I. Zukerman (Eds.). Proceedings of the 6th IJCAI Workshop on Knowledge and Reasoning in Practical Dialogue Systems (KRPD–09), located at IJCAI 2009, July 12, Pasadena, CA, United States, Pages 93–98, IJCAI 2009, 2009.

M. Schiller; C. Benzmüller
Presenting Proofs with Adapted Granularity. In: B. Mertsching; M. Hund; Z. Aziz (Eds.). KI 2009: Advances in Artificial Intelligence. KI–09, in Conjunction with 32nd Annual German Conference on AI, Paderborn, Germany, Paderborn, Germany, Pages 289–279, LNAI, Vol. 5803, Springer, 2009.

M. Schiller; C. Benzmüller
Proof Granularity as an Empirical Problem? In: CSEDU 2010: 1st International Conference on Computer Supported Education. INSTICC Press, 2009.

M. Schiller; C. Benzmüller
Granularity–Adaptive Proof Presentation. In: V. Dimitrova; R. Mizoguchi; B. d. Boulay; A. Graesser (Eds.). Artificial Intelligence in Education – Building Learning Systems that Care: From Knowledge Representation to Affective Modeling. Amsterdam, Pages 599–601, Vol. 200, IOS Press, 2009.

R. Schleicher; M. Rohs; J. Schöning
Eye movements when using a mobile phone to search on wall maps. In: ECEM 2009: Proceedings of the 15th European Conference on Eye Movements. 2009.

M. Schlicker; S. Leinenbach; T. Dollmann; P. Walter; O. Thomas; N. Blinn; M. Nüttgens
Anforderungen an Informationssysteme zur Erhebung, Kommunikation und Bereitstellung relevanter Serviceinformationen im Technischen Kundendienst. PAS, Vol. 1090, Beuth Verlag, Berlin, 2009.

M. Schmitz; H. Quraischy
Tangible interaction with real and virtual products: designing a shopping assistant for rural communities. In: TEI '09: Proceedings of the 3rd International Conference on Tangible and Embedded Interaction. Tangible and Embedded Interaction (TEI–09), February 16–18, Cambridge, United Kingdom, Pages 209–212, ACM, 2009.

J. Schöning
Advanced Natural and Tangible Interfaces for Spatial Information. In: Ubicomp 2009: Adjunct Proceedings of the 11th International Conference on Ubiquitous Computing Doctoral Consortium. ACM, 2009.

J. Schöning
Do we need further multi–touch affordances? In: Touch Affordances: Workshop on Touch Affordances in conjunction with INTERACT. 2009.

J. Schöning; F. Steinicke; A. Krüger; K. Hinrichs
Poster: Interscopic multi–touch surfaces: Using bimanual interaction for intuitive manipulation of spatial data. In: Proceedings of the 2009 IEEE Symposium on 3D User Interfaces–Volume 00 (3DUI–2009), located at IEEE Virtual Reality 2009, March 14–15, Lafayette, Louisiana, United States, Pages 127–128, IEEE, 2009.

J. Schöning; M. Rohs; S. Kratz; M. Löchtefeld; A. Krüger
Map torchlight: a mobile augmented reality camera projector unit. In: Proceedings of the 27th International Conference on Human Factors in Computing Systems (CHI–2009), April 4–9, Boston, United States, Pages 3841–3846, ACM, 2009.

J. Schöning; F. Daiber; A. Krüger; M. Rohs
Using hands and feet to navigate and manipulate spatial data. In: CHI EA '09: Proceedings of the 27th International Conference on Human Factors in Computing Systems (CHI EA–09), April 4–9, Boston, MA, United States, Pages 4663–4668, ACM, 2009.

J. Schöning; T. Bartindale; P. Olivier; D. Jackson; A. Krüger; J. Kitson
iBookmark: locative texts and place–based authoring. In: CHI EA '09: Proceedings of the 27th International Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA–09), April 4–9, Boston, MA, United States, Pages 3775–3780, New York, NY, USA, 2009.

J. Schöning; A. Krüger; P. Olivier
Multi–Touch is Dead, Long live Multi–Touch. CHI 2009: Workshop on Multi–touch and Surface Computing (CHI–2009), April 4 – March 9, Boston, MA, United States, ACM Press, New York, NY, USA, 2009.

J. Schöning; K. Cheverst; M. Löchtefeld; A. Krüger; M. Rohs; F. Taher
Photomap: Using Spontaneously taken Images of Public Maps for Pedestrian Navigation Tasks on Mobile Devices. In: Proceedings of the 11th International Conference on Human–Computer Interaction with Mobile Devices and Service. MobileHCI–2009, Bonn, Germany, ACM, 2009.

J. Schöning; F. Steinicke; A. Krüger; K. Hinrichs; D. Valkov
Bimanual Interaction with Interscopic Multi–Touch Surfaces. In: Human–Computer Interaction INTERACT 2009, (Pages 40–53), Springer, 2009.

L. Schröder; D. Pattinson
Strong completeness of coalgebraic modal logics. In: S. Albers; J.–Y. Marion (Eds.). International Symposium on Theoretical Aspects of Computer Science. STACS–09, Pages 673–684, Schloss Dagstuhl – Leibniz–Zentrum für Informatik; Dagstuhl, Germany, 2009.

L. Schröder; D. Pattinson; C. Kupke
Nominals for Everyone. In: C. Boutilier (Ed.). International Joint Conferences on Artificial Intelligence. IJCAI–09, Pages 917–922, AAAI Press; Menlo Park, CA, United States, 2009.

M. Schröder
Expressive Speech Synthesis: Past, Present, and Possible Futures. In: J. Tao; T. Tan. Affective Information Processing. Pages 111–126, Springer, 2009.

F. Schulz; M. Ebbecke; M. Gillmann; B. Adrian; S. Agne; A. Dengel
Seizing the Treasure: Transferring Layout Knowledge in Invoice Analysis. In: 10th International Conference on Document Analysis and Recognition (ICDAR–09), July 26–29, Barcelona, Spain, Pages 848–852, IEEE, 2009.

K. Schumacher; M. Liwicki; A. Dengel
A Paper–based Technology for Personal Knowledge Management. In: Proceedings of the 5th Conference on Professional Knowledge Management (KM–2009), March 25–27, Solothurn, Switzerland, Pages 289–298, Lecture Notes in Informatics (LNI), Vol. P–145, Köllen Druck+Verlag GmbH, 2009.

I. Seifert
Cooperative Spatial Planning System. In: W. Reinhardt; A. Krüger; M. Ehlers (Eds.). Geoinformatik 2009. GI–Days–09, March 31 – April 2, Osnabrück, Germany, Pages 217–222, ifgiprints, Vol. 35, AKA Verlag, 2009.

I. Seifert; M. Kruppa
A Pool of Topics: Interactive Relational Topic Visualization for Information Discovery. In: e. a. M. Huang (Ed.). Visual Information Communication. VINCI–09, September 24–25, Sydney, Australia, Springer, 2009.

I. Seifert; K. Eichler; H. Hemsen; S. Schmeier; M. Kruppa; G. Neumann; N. Reithinger
DiLiA – A DIGITAL LIBRARY ASSISTANT – A new approach to information discovery through information extraction and Visualization. In: J. Filipe; K. Liu (Eds.). International Conference on Knowledge Management and Information Sharing (KMIS–09), located at The International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management, October 6–8, Madeira, Portugal, INSTICC Press, 2009.

M. Seißler; G. Meixner
Entwicklung eines Transformationsprozesses zur modellbasierten Entwicklung von multimodalen Benutzungsschnittstellen. In: Proceedings of the 8. Berliner Werkstatt Mensch–Maschine–Systeme, October 7–9, Berlin, Germany, 2009.

B. L. Smith; R. Hayes–Harb; M. Bruss; A. Harker
Production and perception of voicing and devoicing in similar German and English word pairs by native speakers of German. In: S. Frisch (Ed.). Journal of Phonetics, Vol. 37, No. 3, Pages 257–275, Elsevier, 2009.

D. Sonntag
Introspection and Adaptable Model Integration for Dialogue–based Question Answering. In: Proceedings of the Twenty–first International Joint Conferences on Artificial Intelligence (IJCAI). Online, 2009.

D. Sonntag; M. Deru; S. Bergweiler
Design and Implementation of Combined Mobile and Touchscreen–Based Multimodal Web 3.0 Interfaces. In: Proceedings of the International Conference on Artificial Intelligence (ICAI). International Conference on Artificial Intelligence, CSREA Press, 2009.

D. Sonntag; P. Wennerberg; P. Buitelaar; S. Zillner
Pillars of Ontology Treatment in the Medical Domain. In: Y. Kalfoglou. Cases on Semantic Interoperability for Information Systems Integration: Practices and Applications. Chapter Pillars of Ontology, Information Science Reference, 2009.

L. Spassova; J. Schöning; G. Kahl; A. Krüger
Innovative Retail Laboratory. In: Springer Lecture Notes in Computer Science (LNCS). AmI09 (AmI–09), in Conjunction with 3rd European Conference on Ambient Intelligence, November 18–21, Salzburg, Austria, Springer, 2009.

C. Stasch; F. Daiber; A. C. Walkowski; J. Schöning; A. Krüger
Multi–Touch– und Multi–User–Interaktion zur Verbesserung des kollaborativen Arbeitens in Katastrophenstäben. In: Geoinformatik 2009. March 31 – April 2, Osnabrück, Germany, ifgi Prints, 2009.

D. Steffen; A. Ebert; M. Deller; P. Dannenmann
Five: Enhancing 3D Wall Displays with a 2D High–Resolution Overlay. In: The 12th IFIP TC.13 Conference on Human–Computer Interaction. INTERACT 2009 (INTERACT–09), August 24–28, Uppsala, Sweden, Lecture Notes in Computer Science (LNCS), Vol. 5726 / 5727, Springer, 2009.

P. Stephan; I. Heck; P. Kraus; G. Frey
Evaluation of Indoor Positioning Technologies under industrial application conditions in the SmartFactoryKL based on EN ISO 9283. In: Proceedings of the 13th IFAC Symposium on Information Control Problems in Manufacturing (INCOM–09), June 3–5, Moscow, Russian Federation, ICS / RAS, 2009.

P. Stephan; I. Heck; P. Kraus; G. Frey
Evaluierung von Indoor–Positioning Systems anhand EN ISO 9283 in der SmartFactoryKL. In: Tagungsbericht VDI AUTOMATION 2009. AUTOMATION 2009, June 16–17, Baden–Baden, Germany, VDI Verlag, 2009.

O. Türk; O. Büyük; A. Haznedaroglu; L. M. Arslan
Application of Voice Conversion for Cross–Language Rap Singing Transformation. In: Proceedings IEEE ICASSP 2009. IEEE International Conference on Acoustics, Speech, and Signal Processing 2009 (ICASSP–2009), located at SST conference 2009, April 19–24, Taipei, Taiwan, Institute of Electrical and Electronics Engineers (IEEE), 2009.

R. Wang; G. Neumann
An Accuracy–Oriented Divide–and–Conquer Strategy for Recognizing Textual Entailment. In: Proceedings of the First Text Analysis Conference (TAC–2008), November 17–19, Gaithersburg, Maryland, United States, National Institute of Standards and Technology (NIST), 2/2009.

R. Wang; S. W. Siu; R. A. Böckmann
Fine–Grained Protein Mutation Extraction from Biological Literature. In: S. S. Mahmoud; K. Jusoff; K. Li (Eds.). Proceedings of ICECT 2009. International Conference on Electronic Computer Technology (ICECT–2009), February 20–22, Macau, China, Pages 401–405, IEEE Computer Society, 2009.

S. Warwas; C. Hahn
The DSML4MAS Development Environment. In: Decker; Sichman; Sierra; Castelfranchi (Eds.). Proceedings of 8th Int. Conf. on Autonomous Agents and Multiagent Systems. 8th Int. Conf. on Autonomous Agents and Multiagent Systems (AAMAS–2009), May 10–15, Budapest, Hungary, Pages 1379–1380, IFAAMAS, 2009.

S. Warwas; C. Hahn
The Platform Independent Modeling Language for Multiagent Systems. In: K. Fischer; J. P. Müller; J. Odell; A. J. Berre. Agent–Based Technologies and Applications for Enterprise Interoperability. Pages 129–153, Lecture Notes in Business Information Processing (LNBIP), Vol. 25, Springer, 2009

S. Warwas; C. Hahn; K. Fischer
A Visual Development Environment for Jade. In: Decker; Sichman; Sierra; Castelfranchi (Eds.). Proceedings of the 8th International Conference on Autonomous Agents and Multiagent Systems (AAMAS–2009), May 10–15, Budapest, Hungary, Pages 1349–1350, IFAAMAS, 2009.

P. Wennerberg; M. Möller; S. Zillner
A Linguistic Approach to Aligning Representations of Human Anatomy and Radiology. In: Proceedings of the International Conference on Biomedical Ontologies (ICBO), 2009.

P. Wennerberg; M. Möller; P. Buitelaar; S. Zillner
Ontology Based Clinical Query Extraction. In: Proceedings of 2nd AMIA Summit on Translational Bioinformatics. 2nd AMIA Summit on Translational Bioinformatics (AMIA–2009), March 15–17, San Francisco, CA, United States, 2009.

E. Wilde; S. Boll; K. Cheverst; P. Fröhlich; R. Purves; J. Schöning
Second International Workshop on Location and the Web. In: LOCWEB '09: Proceedings of the 2nd International Workshop on Location and the Web (LOCWEB–09), located at in Conjunction with CHI 09, April 4, Boston, MA, United States, Pages 1–2, ACM, 2009.

D. Wilmsmann; J. Müller; J. Exeler; M. Buzeck; A. Schmidt; T. Jay; A. Krüger
Display Blindness: The Effect of Expectations on Attention towards Digital Signage. In: Pervasive 2009. May 11–14, Nara, Japan, Pages 1–8, Vol. 5538/2009, Springer, 2009.

C.–P. Wirth; J. Siekmann; C. Benzmüller; S. Autexier
Jacques Herbrand: Life, Logic, and Automated Deduction. In: D. M. Gabbay; J. Woods. Logic from Russell to Church. Pages 195–254, Handbook of The History of Logic, Vol. 5, Elsevier, 2009.

M. Wüthrich; M. Liwicki; A. Fischer; E. Indermühle; H. Bunke; G. Viehhauser; M. Stolz
Language Model Integration for the Recognition of Handwritten Medieval Documents. In: Proceedings 10 Int. Conf. Document Analysis and Recognition 2009. ICDAR–09, Barcelona, Spain, Pages 211–215, 2009.

H. Zender; G. J. Kruijff; I. Kruijff–Korbayová
A Situated Context Model for Resolution and Generation of Referring Expressions. In: Proceedings of the 12th European Workshop on Natural Language Generation. ENLG–2009, located at EACL 2009, March 30–31, Athens, Greece, Pages 126–129, 2009

H. Zender; G. J. Kruijff; I. Kruijff–Korbayová
Situated Resolution and Generation of Spatial Referring Expressions for Robotic Assistants. In: Proceedings of the Twenty–first International Joint Conference on Artificial Intelligence. Twenty–first International Joint Conference on Artificial Intelligence (IJCAI–09), July 11–17, Pasadena, CA, United States, 2009.

D. Zühlke
SmartFactory – A Vision becomes Reality. In: Keynote Papers of the 13th IFAC Symposium on Information Control Problems in Manufacturing (INCOM 09), June 3–5, Moscow, Russian Federation, ICS / RAS, 2009.

DFKI – 20 Years of Innovation

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The German Research Center for Artificial Intelligence (DFKI GmbH), with facilities in Kaiserslautern, Saarbrücken, Bremen and a project office in Berlin, is the country's leading business prone research center in the area of innovative software technology. In the international scientific community, DFKI is recognized as one of the most important „Centers of Excellence" in the world for its proven ability to rapidly bring leading edge research to commercially relevant application solutions.

DFKI was founded in 1988 as a non-profit organization by several renowned German IT companies and two research facilities. Since then, DFKI GmbH has established a reputation for proactive and customer oriented work and is known both nationally and internationally as a competent and reliable partner for commercial innovation.

DFKI project office Berlin

Because of the increasingly short cycles of innovation in the field of information technology, the lines between research, application related development, and conversion to products are becoming blurred. This is why DFKI projects typically include the entire spectrum from basic application-based research to market and customer oriented development of product functions. DFKI GmbH is managed by Professor Wolfgang Wahlster (Chairman and CEO) and Dr. Walter G. Olthoff (CFO).

Projects at DFKI are organized under one of the following areas of research:
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▸ Safe and Secure Cognitive Systems (Prof. Dr. Bernd Krieg-Brückner)
▸ Innovative Retail Laboratory (Prof. Dr. Antonio Krüger)
▸ Institute for Information Systems at DFKI (Prof. Dr. Peter Loos)
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▸ Augmented Vision (Prof. Dr. Didier Stricker)
▸ Language Technology (Prof. Dr. Hans Uszkoreit)
▸ Intelligent User Interfaces (Prof. Dr. Dr. h.c. mult. Wolfgang Wahlster)
▸ Innovative Factory Systems (Prof. Dr.-Ing. Detlef Zühlke).

The official opening of the DFKI project office Berlin in 2007 signals the further expansion of existing partnerships within Berlin's research community and the implementation of innovative solutions with new industry partners.

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The purpose of the DFKI Transfer Center is to make the scientific findings of DFKI available to commercial applications.

With a projected overall annual budget in 2009 of more than € 28 million, the previous year's record result was surpassed. Currently, DFKI has 341 employees and 295 student assistants. The circle of DFKI industrial partners comprises among others Daimler AG, Deutsche Telekom AG, SAP AG, IDS Scheer AG, Bertelsmann AG, Microsoft Deutschland GmbH, Deutsche Post AG, BMW AG, Deutsche Messe AG, EADS Astrium GmbH and Ricoh Ltd. By acquisition of company stakes, Harting KGaA and Bremen University joined the circle in 2009.

Bremen Site

All work is organized in projects that have a clear objective, are scheduled to last for a specific period of time, and that lead, among other things, to patented solutions, prototypes, or new or improved product functions. At the present time, there are about 90 ongoing projects. Project progress is checked once a year by an independent, international group of respected experts. In addition to the BMBF and EU grants for large, joint research projects, substantial contracts from business enterprises could also be acquired in 2009. The successful transfer of DFKI research results to functional products is continuing. The DFKI model of a non-profit Public-Private-Partnership (PPP) was positively received at numerous presentations and is often recommended as a role model structure. December 2004 marked the most recent review of DFKI in the 5-year evaluation circle by the Federal Ministry of Education and Research (BMBF), with positive results. There is even an effort to incorporate the PPP organizational structure into the Federal Grant Handbook and the text of relevant laws. DFKI has membership rights in the Center for the Evaluation of Languages and Technologies (CELCT), based in Trento, in Yocoy Technologies GmbH (Berlin) and in SemVox GmbH (Saarbrücken).

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