

NEWSLETTER



GERMAN RESEARCH CENTER FOR ARTIFICIAL INTELLIGENCE

1/2009

RESEARCH LABS

IMAGE UNDERSTANDING AND PATTERN RECOGNITION

KNOWLEDGE MANAGEMENT

ROBOTICS

SAFE AND SECURE COGNITIVE SYSTEMS

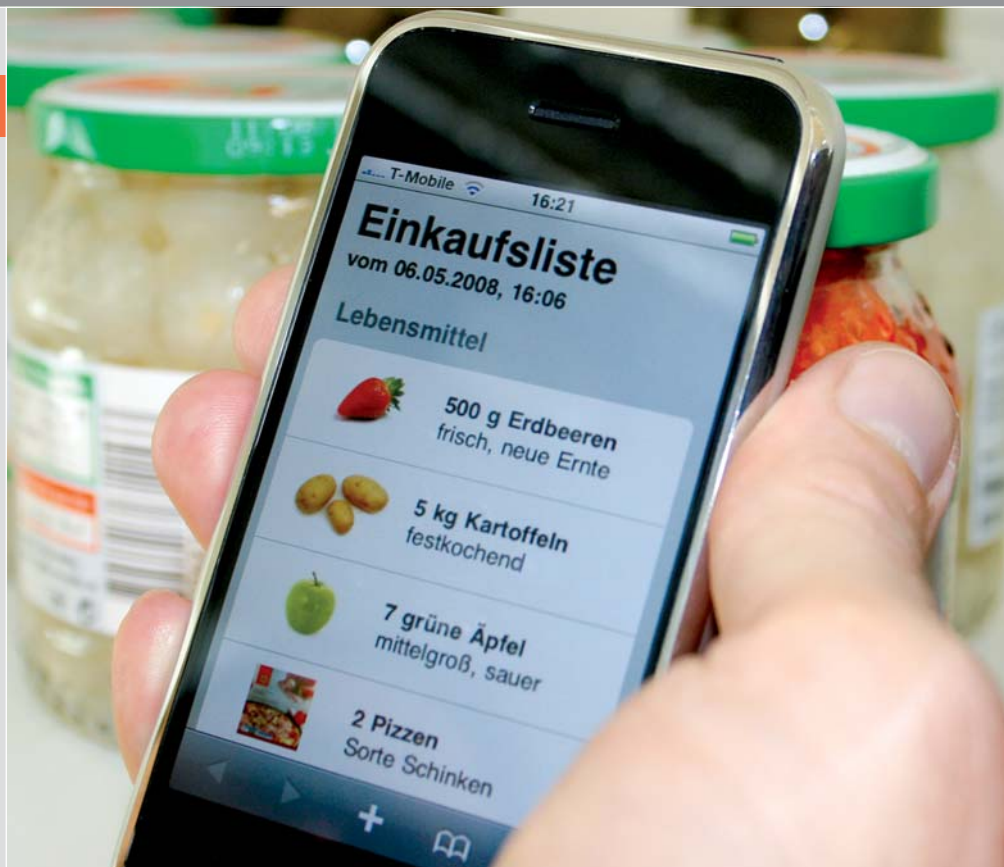
INSTITUTE FOR INFORMATION SYSTEMS

AGENTS AND SIMULATED REALITY

AUGMENTED VISION

LANGUAGE TECHNOLOGY

INTELLIGENT USER INTERFACES



DFKI at CeBIT 2009 

ADiWa – Alliance Digital Product Flow

Germany
Land of Ideas



IRL – Selected Landmark 2009



Exhibition Focal Point

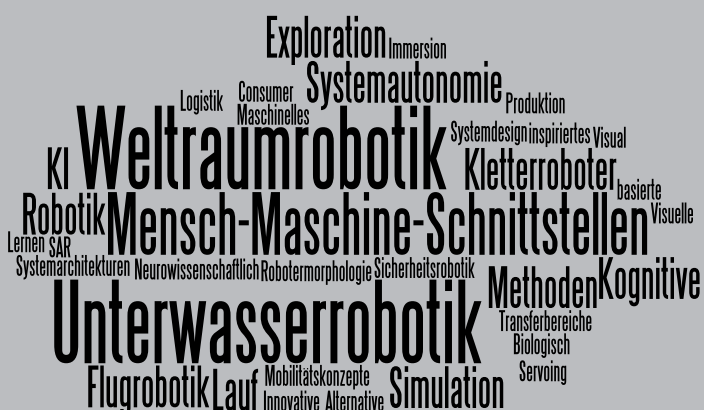
Mobile Robots & Autonomous Systems



Intelligent mobile systems and components for industrial production, public services and the service sector.

Focus on Robotics

Once more DFKI will present itself within the framework of the special display area „Industrial Automation – Mobile Robots & Autonomous Systems“ (Hall 22, Stand A56) at Hannover Messe 2009, and will discuss current projects and perspectives at the speakers forum.



April 20 - 24, 2009

9.00 – 18.00

Hall 22, Stand A56

www.dfki.de/robotics



"Alliance Digital Product Flow" Begins on BMBF Research Day

Germany's largest suppliers of business software, in collaboration with other partners from the scientific and business communities, are advancing the utility of the Internet of Things for intelligent business processes in the context of a joint research project. The plan calls for the use of all process relevant data from the Internet of Things in order to make business process design more flexible and customizable.



l.-r. Ministerialdirektor Dr. Wolf-Dieter Lukas, Department Head BMBF; Prof. Henning Kagermann, SAP; Prof. Wolfgang Wahlster; Gerrit Kahl, DFKI

The "Alliance Digital Product Flow" (ADiWa) is funded by the Federal Ministry of Education and Research (BMBF) with the amount of € 17.7 million. Besides lead coordinator SAP AG, the initiators include: DFKI, Fraunhofer-Gesellschaft, IDS Scheer AG, Software AG as well as the Technical University of Darmstadt and the Institute of Applied Computer Science at the Technical University of Dresden.

With the signing of the cooperation agreement by the project partners and the transfer of the notice of grant by State Secretary Andreas Storm, BMBF, on "Tag der Forschung" on February 5, 2009 in Darmstadt, the alliance officially began work.

"Our strengths are in the areas of merchandise, goods, and production. With the Internet of Things Germany has an opportunity to assume a leading role in the design of the internet of the future and its applications", said State Secretary Andreas Storm, Federal Ministry of Education and Research. The aim of the "Alliance Digital Product Flow" (ADiWa) project is to explore these technologies for business applications for the planning, control, and execution of complex and interactive business processes via the Internet of Things. Until now the technologies of the Internet of Things have been employed to identify objects or to automate data capture at individual process steps, for example, for receiving and shipping. The goal here is to discover a way to use the ADiWa methods and tools to capture all the events occurring at an object and analyze them from an economic and ecologic perspective in a structured way, in order to facilitate the automated planning, control, and optimization of integrated business processes with the flow of goods and information.

"Alliance Digital Product Flow combines two of Germany's strongest areas of information technology research: embedded systems as the basis for the Internet of Things, and business software as the basis for the Internet of Services. German companies are the market leaders in both of these areas. The state of Saarland, home to DFKI, IDS Scheer, and Globus, is well represented in the alliance by these three strong partners" explained Prof. Wahlster in discussing the contribution of DFKI on "Tag der Forschung".

DFKI displayed preliminary results of ADiWa and a demonstrator from the SemProM (Semantic Product Memory) joint research project which combines concepts from both projects. Using the mobile factory components, DFKI researchers demonstrated an industrial manufacturing process whereby diverse information and communication technologies are integrated in the design of automation systems. When filling vitamin capsules according to customer specification, process data is stored by means of RFID technology directly on the product containers – a digital product memory is created so that data can be read from the finished



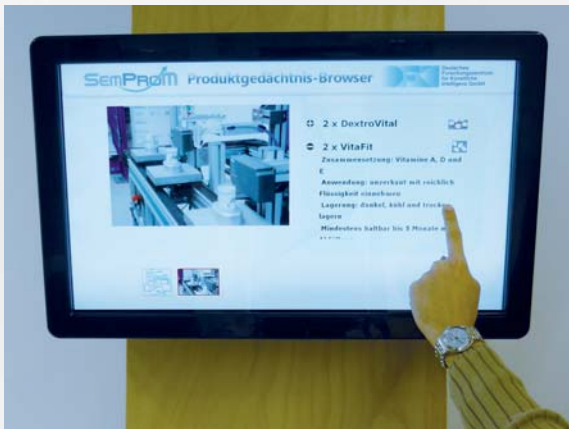
l.-r. Andreas Storm, State Secretary BMBF; Prof. Dieter Rombach, Fraunhofer IESE; Prof. Wolfgang Wahlster, DFKI; Dr. Wolfram Jost, IDS Scheer; Dr. Peter Kürpick, Software AG; Prof. Henning Kagermann, SAP

product. The aim of ADiWa is to prepare this information and use it to select complex interactive business processes in order to compose, control or even rewrite them completely.

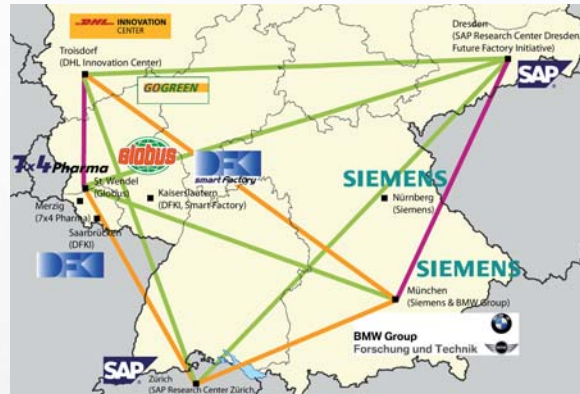
More information
www.adiwa.net
www.sempro.org

Innovation Alliance SemProM – Products Keep a Diary

Products keep their own diary; they know the place and temperature on their date of manufacture, they are aware of what individual components have been assembled, what properties they have, and which among them was ordered by a specific customer. They know how they are to be stored, where they are to be transported, and when they are to be serviced. Together with its consortium partners, DFKI is leading the way to the Internet of Things. The ideas, the technological visions of the future, and the promise of semantic digital product memories are being developed under the SemProM (Semantic Product Memory) innovation alliance funded by the Federal Ministry of Education and Research (BMBF).



The initial SemProM results are being shown under the motto "Life in 2020 – Take a look at tomorrow's world". Three DFKI research departments have contributed:



SemProM – logistics demonstrator

Intelligent User Interfaces directed by Prof. Dr. Wolfgang Wahlster and Robotics directed by Prof. Dr. Frank Kirchner, in addition to the DFKI-SmartFactory^{KL} managed by Prof. Dr. Detlef Zühlke.

The SemProM demonstration system presents six different aspects of the digital product memory on the BMBF stand (Hall 9, B40) at CeBIT. It gives visitors an opportunity to interact directly with the digital product memory of an individually configured sample product for the purpose of determining and tracking its life cycle – from the start of the manufacturing process through various logistic stations to its end use by the consumer.

The demonstrator relies on a company-wide communication system based on digital product memories to illustrate an open-loop process. Specific examples use the digital memories of the products manufactured in a

SEMProM Produktgedächtnis-Browser Deutsches Forschungszentrum für Künstliche Intelligenz GmbH



Befüllung bei Smart Factory

- ⊕ 1 x DextroVital
- ⊕ 2 x VitaFit
- ⊕ 3 x Mineralia
- ⊕ Informationen zur Abfüllung





several step process of the SemProM manufacturing chain as well as several other selected products from daily life.

The SemProM logistics demonstrator shows, after the input of a virtual route, how various product instances expand the diverse memory content being generated by a variety of logistic events between the "Manufacture" and "Display in memory browser" stations. Along the route, in addition to the expected logistic events (e.g., transport via train, truck, etc.) the product may experience various failure events (refrigeration outage, hail storm, traffic jam, etc.). Whenever such events occur, dynamic information like the CO2 balance (carbon footprint), temperature, vibration/concussion, and time is captured in the product memory.

Highly miniaturized embedded elements, RFID technology, instrumented environments, and an intelligent sensor network support the capture and analysis of product-related observations at the level of individual objects. The information flow is based on semantic technologies, machine-to-machine communication (M2M), and multimodal interaction.

By means of a filling machine for dietary supplements at the mobile component of the DFKI-SmartFactory^{KL}, a production process which permits the adaptive manufacture of products according to customer specifications, and which is optimized by memory technologies, is pre-



sented. The parameterization of the entire production process is based on order data, which is stored directly in the digital memory of the respective product. Beyond this, the content of the memory is enriched with the data generated over the course of the production processes. This is important, especially, for the tracking of sensitive or high value products.

A two-armed robotic system for the automated handling of non-uniform work pieces imports the data, e.g., weight, dimensions, lifting points from the product memory. In combination with object recognition and visual servoing, this memory information facilitates autonomous gripping, handling operations and an adaptive handover process for semi-finished goods

between the various manufacturing stations. Multiple cameras are employed in the visual servoing process which monitors and supports the manipulation for a coordinated two-arm control. Additionally, equipping the robot with a movable torso enables an optimal alignment with the work environment and the object being manipulated.



Similar to an information kiosk, a memory browser enables rapid browsing and retrieval of the respective memory content. When the operator defines the product, the object is first identified. Then the system employs a semantic representation from the memory content using a "semantic product screener" to formulate the content into a language that can be understood by the operator. For example, the manufacturer's declaration for the E-number "E306" lists it as vitamin E, and links it to a warning notice if the supplement has an assigned potential to cause an allergic reaction.

The digital product memory enables users to check and track all of the production and sales processes for an individual product in detail all along the value-added chain. Thanks to the memory browser, the operator is in a position to find and understand all information relevant to their needs.

More information
www.semпром.org

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► In Touch with THESEUS: CoMET – Collaborative Media Exchange Terminal

CoMET – an outcome of the BMWi THESEUS Project – demonstrates how multiple users intuitively exchange information and media at a multitouch-terminal using spoken language and gestures: photo, video, and music files can be grouped, annotated, shared or simply played back.

The CoMET system (Collaborative Media Exchange Terminal) developed by DFKI-Saarbrücken lets the user experience the fascination of the social semantic web or Web 3.0. CoMET and its various modalities convey an impression of how online interaction with the semantic web could look in the future.

The media stored on a mobile phone are used as the input packets for the CoMET system. Interaction with these ordinarily heterogeneous data packets is possible using gestures or speech. Intelligent agents (spotlets) provide various interactive possibilities for further processing of one or more media objects, for example, for enabling semantic operations or for requesting external web services.

Working with the approaches and innovative technologies of the semantic web is often extremely complex for non-specialists. Thanks to the simple and intuitive interactive design of CoMET, users are now in a position to better manage these technologies without overcomplicating the presentation with details about the semantic technologies employed. The framework provides interfaces for multimodal interaction, such as a combination of speech and gestures.

The aim of the CoMET projects is to develop a framework that can process and exchange several types of media content on the basis of semantic internet technologies. This approach enables the flexible systems integration in many different contexts and applications. The framework assists the user with common social software functionalities and intelligent tag recommendation methods supplied over an intuitive, GUI-based interface.

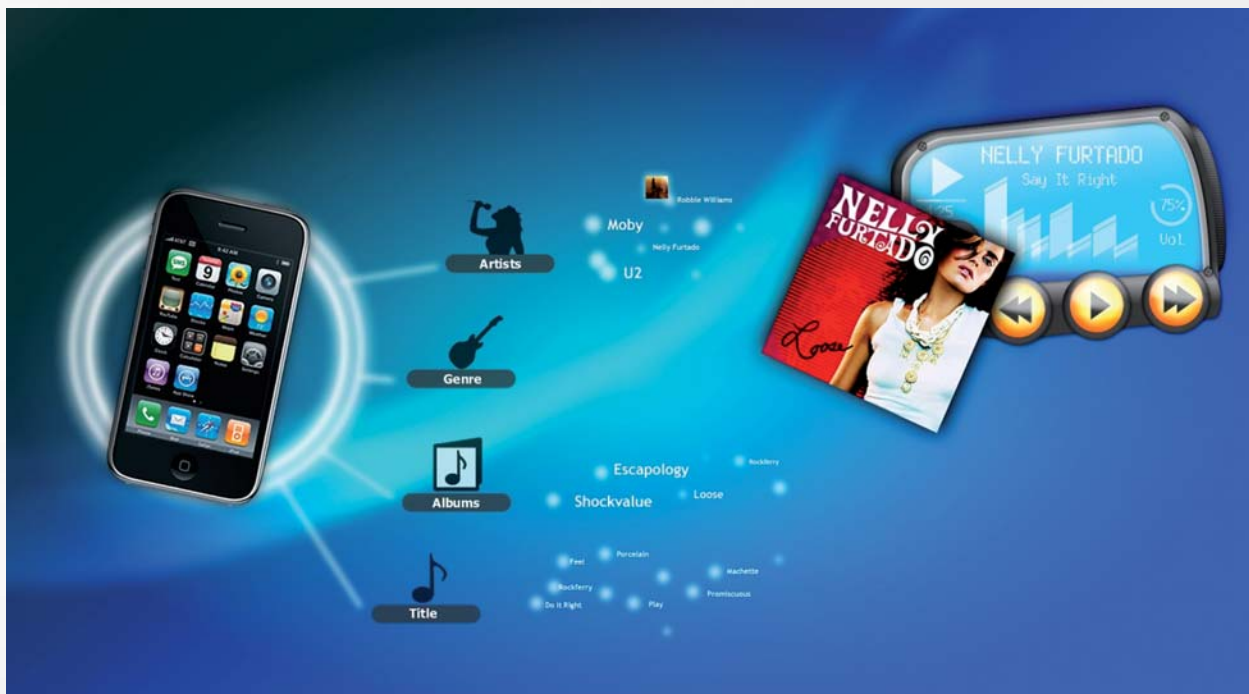
The multimodal dialogue system is based on ODP-Technology (ontology-based dialogue platform). It is able to interpret the input modes Speech and Gesture and enables rapid access to the ontological representation of extracted media data like MP3 and video.

More information and video

www.dfki.de/iui/advantilab
<http://tr.im/cometvideo>

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An Intelligent Assistant for the Disabled



On the basis of the Xeno wheelchair made by Otto Bock Healthcare, DFKI is developing and testing intelligent assistants that compensate for the loss of physical and cognitive abilities: the safety assistant applies the brakes as required; the driver assistant avoids obstacles and makes door frame transits easier; the navigation assistant chooses the path or the route autonomously; interaction is facilitated by a head-fitted joystick and natural spoken language dialog, permitting greater and safer mobility.

A whole new range of mobility is possible with a navigation assistant that knows the way or drives the wheelchair autonomously over frequently used routes or can even switch to autonomous control mode if the user is overtired. Safety is increased by the exclusion of danger zones like stairways, curbstones, and roads.

The user can choose a destination and the wheelchair will proceed towards it independently, or – similar to navigation systems for cars – the system will provide a route suggestion and movement can be controlled by the driver. Whereas the fixed route selection insures collision free navigation through the static surroundings, the same is guaranteed by the interactive safety assistant while travelling through a dynamic environment, for example, one with pedestrians.

Interactive communication is provided via natural language or a touch screen monitor so that the user, who may be unable to use a joystick due to motor or cognitive disabilities, will still be able to control the electric wheelchair. The integration of the above-mentioned assistants supports the control of the wheelchair. In the case of the navigation assistant, the route selection is possible via natural language or touch screen communication. If there is any ambiguity or a misun-



derstanding, the system generates a message requesting clarification. The assistants are being developed under the EU Framework Project, SHARE-it (Supported Human Autonomy for Recovery and Enhancement of Cognitive and Motor Abilities Using Information Technologies), of which DFKI is one of eight project partners. The project term lasts from the beginning of 2007 until the end of 2009.



The natural language dialog is being developed as part of sub-project I3 – [SharC] within the special research topic „Spatial Cognition“, SFB/TR 8, of the German Research Foundation (DFG). Selected assistants have just entered into advanced development with an industrial prototype being developed in cooperation with Otto Bock under the new sub-project T1 – [Rolland].



More information
www.ist-shareit.eu
www.sfbtr8.uni-bremen.de

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► **Mobile Autonomous Systems – Innovative Robotic Solutions from Bremen**



The robotics research team managed by Prof. Dr. Frank Kirchner develops mobile robotic systems that are capable of solving complex tasks on land, under water, or in the air. The systems are often designed on the basis of living examples observed in nature: four-, six-, and eight-legged climbing and walking robots, serpentine underwater vehicles and two-armed transport robots resemble natural forms occurring in the environment.

The advantages of innovative materials combine with the models and forms of locomotion that have been proven by years of evolution. The scientists at the Robotics Lab develop solutions for the following application areas: Logistics, Production, and Consumer (LPC), SAR (Search and Rescue), safety robotics, cognitive robotics, underwater and space robotics. The lab implements basic research derived from Prof. Dr. Frank Kirchner's Robotics Working Group at the University of Bremen.



DFKI Department of Robotics designs and implements intelligent, cognitive robotic systems as well as complex, integrated systems for the most diverse applications within the framework of government funded collaborative research projects as well as on behalf of commercial contract research – with the focus always being on the rapid transfer of basic research results to practical applications. A two-armed robotic system built by the

robotics team for the automated handling of non-uniform work pieces will be on display at the BMBF CeBIT stand area (Hall 9, Stand B40). This robot is unique in that it can read data from a digital product memory, for example, size, weight or lifting points of a product. In this way, it achieves a significant time advantage in the identification of relevant object parameters.



More information
www.dfki.de/robotik

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AVILUSplus – Gesture-Controlled Visualization of Process and Product Data

Imagine an innovative, highly specialized component being integrated into factory equipment. Engineers, master workman, and mechanics throughout the factory can discuss what is to be monitored in the manufacturing process. Simply by pointing on a piece of equipment, specific information like data sheets, current process data, repair and disassembly instructions can be locally called up and visualized. For example, the instructions for the next manufacturing step can be presented to the mechanic in a head-mounted display.



DFKI Research Department "Augmented Reality" has implemented a demonstrator on the basis of a pump system that will be demonstrated to the public for the first time at CeBIT 2009. By pointing at the individual parts of the pump, information can be deliberately requested and displayed by making an "open hand" gesture. The role of the head-mounted display is to be performed here by a viewing screen mounted behind the exhibit, which shows the selected data superimposed on the pump. A critical condition for this augmented reality technology is the "tracking" of

real objects, in this case, the tracking of the hand, to obtain information about positioning and movements. The main objective is to improve the marker-free tracking method, especially in terms of reliability.

The hand and finger detection method used in this area of DFKI research serves as the basis for a comprehensive positioning recognition technology. It uses an anatomically correct model of the human hand calculated to 27 degrees of freedom, which in addition to the pure hand position classification, also determines the angles of the knuckle joints. Augmented reality places extreme demands on real time responsiveness all along the processing chain, sometimes to include a mobility requirement for the hardware, which in turn demands a very efficient run time performance from the respective algorithms.

More information
www.dfki.de/av

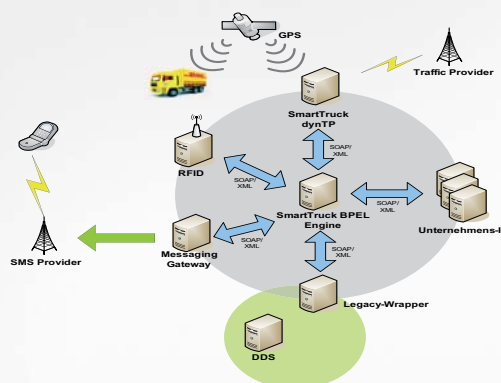
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SmartTruck – Intelligent Logistics for Freight Traffic and Economic Transactions

The aim of the SmartTruck project is to optimize the logistic supply chain for freight transport and economic transactions, especially in terms of the so called "first and last mile" – i.e., from the point of pickup, through the distribution center, to the delivery at the final destination. The project will identify points where new technologies offer the potential for improvements and develop the prototypes to implement the concepts.

Vehicle and telematic data such as vehicle location, freight cargo, and traffic warnings enable reconciliation with transportation planning and scheduling systems, in order to calculate alternate routes and to visualize them for the drivers. Various technologies in the areas of interactive route planning and RFID as well as geo- and telematic data have been integrated to enter, process, and distribute relevant information. SmartTruck has integrated these innovative technologies into a practical transport support system that is being employed in a three-month pilot program by DHL Express Deutschland tested in Berlin.

The consortium leader for the project is Deutsche Post World Net Technology & Innovation Management. Project partners are the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt, DLR) and DFKI. DFKI has responsibility for the design and implementation of the IT systems for central vehicle scheduling and control in addition to their integration within the vehicle components. Beyond this, DFKI provides project support for requirements specification, new business process design, test management, and software piloting.



DFKI will introduce a software prototype at CeBIT 2009 to illustrate how the SmartTruck software processes individual business transactions within a logistic disposition system and transmits data to the respective components of the system.

More information
www.intelligente-logistik.org/projekte/smarttruck.html
www.dhl-innovation.de/de/projekte/smarttruck.php

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▶ PIPE – Hybrid Added Value in Equipment Manufacturing and Plant Construction



The PIPE project is developing a process-oriented information system for mobile, internet-based support of technical customer services (TCS) for the equipment manufacturing and plant construction sector. Using an interactive mobile application, a PDA or a notebook for example, customer service technicians can receive service information about the facility where they are currently working. Besides static information like texts, images, and

videos, interactive step-by-step manuals will help leading the technicians through the service process. The life cycle of this process-oriented service information takes the center stage of the project. These are being developed, made available for use, and continuously improved in cooperation with the equipment manufacturer, specialized service companies, and TCS users.

The various services corresponding to the information created are taken into account holistically and managed in cooperation with technical product development and the TCS departments. In this way, the traditional technical products and their associated services are integrated into a hybrid product, which the customer services orga-

nizations can then exploit to an optimal extent. A real case study involving sanitation, heating, and air conditioning services is used to illustrate the potential of the system.

The consortium manager for Project PIPE is the Institute for Information Systems (IWi) at DFKI. The following organizations are also members of the PIPE consortium: Vaillant & Co. of Germany, the Association of Plumbing, Heating, and Airconditioning for Hessen, the German Institute for Standardization (DIN Deutsches Institut für Normung e.V.), INTERACTIVE Software Solutions of Saarbrücken, and the Department of Information Sciences at the University of Hamburg.



DFKI will present the mobile application system in its current development phase at CeBIT 2009.

More information
www.pipe-projekt.de

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▶ EXPLAIN – Expert-aided Development Tool Set for the Production of Training Media for the Product Life Cycle at Industrial Companies



Business enterprises today face a complex and resource intensive challenge in the production of digital training media for advanced and continuous education purposes. Despite the growing importance of "eLearning" and "technology-enhanced learning", monetary and human resource constraints still pose obstacles to such in-house development projects. Most companies lack the manageable infrastructure necessary for efficient and effective content-development, one that adapts to the specific training needs and provides adequate support for implementing didactic and technological requirements.

The Web 2.0 based "Authoring Management Platform", known as EXPLAIN and funded by the Federal Ministry of Economics and Technology (BMWi), is such an infrastructure. At CeBIT 2009, DFKI will show that EXPLAIN can be employed both to support operational content development processes as well as for overall content project management.

Other topics presented at CeBIT include intelligent value added services for the integration of existing authoring tools and distributed resource pools comprised of offers

from internal and external content providers, the provision of a didactic assistant for planning and implementing diverse pedagogic scenarios as well as team services for internal project- and cross-company communication and collaboration.

In addition, the market-oriented, advanced development of the EXPLAIN platform will be presented by means of linking the system to commercially available authoring tools (e.g., Dynamic Powertrainer) and Web 2.0 content management platforms (e.g., SLIDESTAR). At the same time this points up the many successful examples of technology transfer from application oriented research prototypes to ready-for-market products in the area of authoring management and content production.

More information
www.explain-project.de

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Agile Business Engineering with PROWIT – Web 2.0 Technologies in the Design of Business Processes

The spread of Web 2.0 technologies into the end-user domain has disclosed a wide range of application possibilities in the area of business process management. The use of Web 2.0 technologies promises a significant improvement in the effectiveness and efficiency of business process management. This is true perhaps, but how can blogs, wikis, mashups, podcasts, etc., which have become so widely accepted in everyday usage, be put to use in the business world?

At the Institute for Information Systems (IWi), analyses have been performed that show the diverse potential of Web 2.0-technologies for the field of business process management:

- ▶ **Definition and Modeling:** Models of business processes can be produced in a collaborative manner.
- ▶ **Implementation:** Blogs can be used to inform people about changes, modifications and innovations at the introduction of a process, videocasts can be used to disseminate multimedia learning content related to changing processes.
- ▶ **Execution:** During performance, communities of all participating individuals are formed for the unproblematic exchange of important information and assignment of outstanding tasks ("process community").

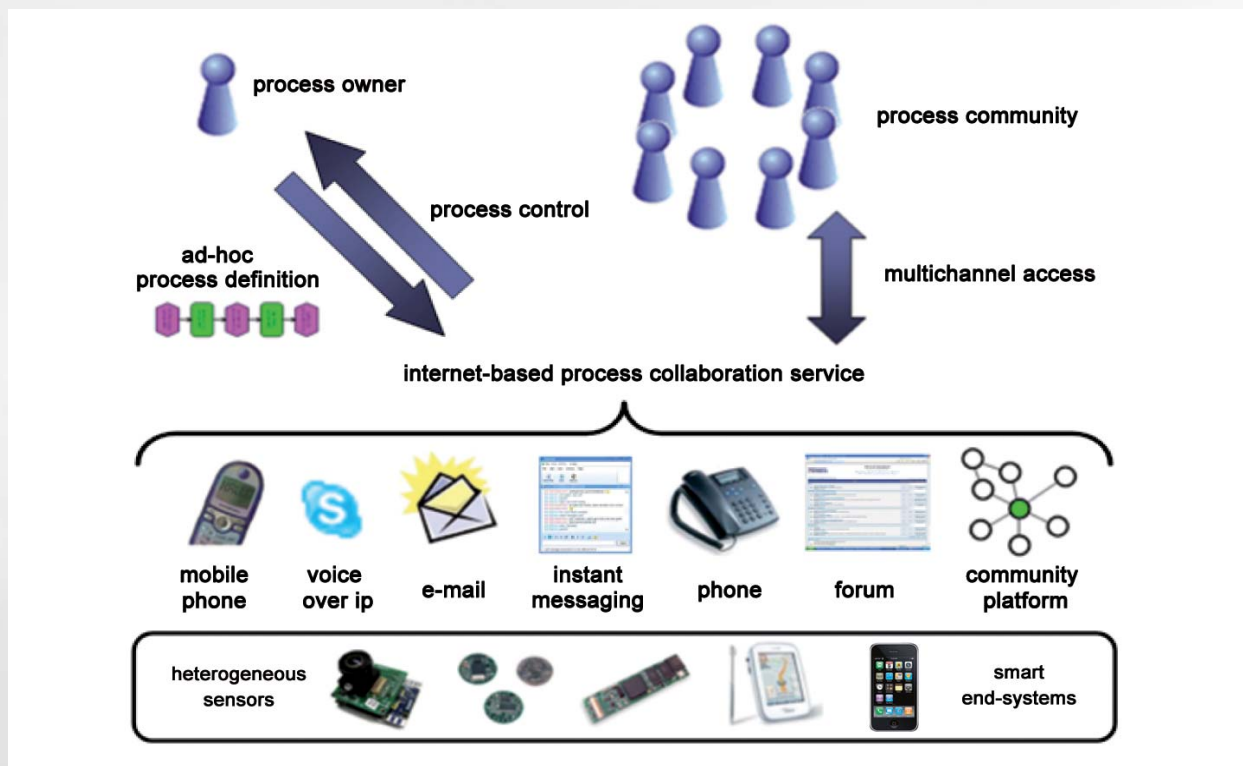
- ▶ **Monitoring and controlling:** Important process figures from different systems can be integrated in a mashup.
- ▶ **Optimization and advanced development:** Staff can evaluate the performance capabilities of existing processes and implement recommended improvements to the model.

Over the course of the next three years, the BMBF funded PROWIT project will implement these and other possible applications by means of demonstration scenarios. The Institute for Information Systems is cooperating with other prestigious partners such as IDS Scheer AG, IMC Information Multimedia Communication AG, and the "Multimedia Communication"-department of the Technical University of Darmstadt.

In case you are looking for additional information or if you are interested in a pilot application, DFKI-IWi gladly answers your request.

More information
<http://iwi.dfki.de>

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► Commius: E-mail-based Collaborative Business Processes for SMEs



E-mail communication has become an established part of the everyday way of doing business for small and middle-sized companies (SME). Although information and communication via e-mail is to a large extent an unstructured process, it is frequently used for the coordination and implementation of complex business processes.

The aim of the European project Commius (Community-Based Interoperability for SMEs) is to make collaborative business processes as user friendly as possible. Therefore, they have been divided into three corresponding interoperability levels: system, semantic, and process interoperability.

The Commius system will link existing e-mail structures (system interoperability) and, depending on their content (semantic interoperability), enrich incoming e-mails with additional context sensitive information, and it will recommend subsequent steps within the business process (process interoperability). Additionally, simple customizing tools can be used to adjust the type and

level of detail depending on the application domain and the user preferences. This scenario will be demonstrated at CeBIT using a prototype which enables the user to interactively adjust and manage various standard processes, for example, the processing of incoming orders.

Since the Commius solution is specifically tailored to the needs of SMEs, the project is designed to keep start-up and operating costs to a minimum to insure that the solution will be available to the greatest number of users. This basic approach is supported by the project's modular architecture and the open source exchange.

More information
www.commius.eu

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► Talk of the Town with Gossip Galore

The amount of information available via the internet is simply staggering. In order to familiarize with a certain subject and stay proficient in the latest developments, the appropriate online sources have to be found and analyzed. This can be a daunting and very time consuming task given the size and diversity of the internet. Wouldn't it be more efficient if computers could read and analyze the web pages for us and we could ask the computer questions about the topic?



The RASCALLI project at DFKI has created an agent named Gossip Galore. Gossip Galore is a virtual person who hangs out with musicians and rock bands and is well informed about the pop and rock music scene, which means she always has something to say about the latest

rumors. Users can talk to her by entering their questions in a chat box. Gossip Galore is equipped to provide a multimodal response.

The answers are spoken by the speech synthesis system MARY, supported by gestures and – where feasible – supplemented with suitable graphics. For example, it is possible to discover previously unknown links after graphically examining the social network of an artist.

The real strength of Gossip Galore lies in the underlying knowledge base. After modeling the domain, the knowledge base is filled by employing the latest information extraction methods. Information wrapping is used to make a deliberate search of structured or semi-structured web pages like "Wikipedia". The knowledge base is then enriched by a relational extraction system called DARE. DARE learns mapping patterns from linguistic analyses of relational instances with minimal human intervention. Then, using these patterns, relationships are extracted from free text and added to the knowledge base.

More information
www.ofai.at/rascalli

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Innovative Retail Lab: Landmark in the Land of Ideas 2009

Germany Land of Ideas



Selected Landmark 2009

The Innovative Retail Lab operated by DFKI and GLOBUS SB-Warenhaus Holding is one of the "365 Landmarks in the Land of Ideas" each of which will present their ideas to the public on one day in 2009. The "Germany – Land of Ideas" initiative is sponsored by the Federal President. The IRL came out on top of the entries submitted by more than 2000 competitors. The public is invited to learn more about the work of the Innovative Retail Lab (IRL) in St. Wendel, Germany, starting at 11.00 on May 18, 2009.

At the IRL, DFKI is exploring the intelligent services and interactive shopping designs of the future: a shopping list that is customized for the supermarket and checks for current specials; a shopping cart that guides the customer to the desired products and provides recipe suggestions and reminders so nothing is forgotten; a digital "product magnifying glass" that not only informs you about the source, ingredients, or allergens, but also serves as your personal consultant, an emotional character with optional nutrition tips; and even a frozen foods cabinet that knows the current temperature of frozen items and "discusses" the best-before date with the refrigerator at home.

"Located at the headquarters of GLOBUS SB-Warenhaus Holding in the state of Saarland, the IRL Research Lab has an ideal infrastructure that allows DFKI scientists to take an integrated approach to intelligent shopping environments," said Prof. Dr. Wolfgang Wahlster, CEO of DFKI. "My special appreciation goes to Thomas Bruch, head of GLOBUS Holding, for providing this opportunity at his company and making this important contribution towards a meaningful cooperation between the research and business communities."

New forms of intelligent business logistics and customer interaction are being tested in near-reality situations in direct cooperation with practitioners, with home and market areas networked, instrumented, and equipped with sensors and linked to real warehouse data and processes.

Concepts and designs for the digital product memory innovation alliance of the Federal Ministry of Education and Research (BMBF) are also being studied and implemented: The SemProM (Semantic Product Memory) project is working on the key technologies for the "Internet of Things". Products keep their own logs, smart labels give them a memory and support intelligent logistics. Integrated sensors make manufacturing complexities more transparent, supply chain and environmental influences more comprehensible. The producer is supported and the consumer is better informed.

The Internet of Things opens new opportunities in retailing through user friendly interfaces. The "intelligent" products have the potential to go well beyond the pure identification function of today's RFID tags. It includes analysis of data obtained from various embedded sensors (e.g. temperature, brightness, humidity, speed, acceleration, position) and the capture of all relevant product and operational data.

In the Internet of Things, this information can be dynamically exchanged with the surroundings, the users, and with other products.



Event location on May 18, 2009

"Open House at the Lab"

DFKI GmbH IRL Lab
GLOBUS SB-Warenhaus Holding
Leipzigerstr. 8
66606 St. Wendel

More information

www.dfki.de/irl
www.land-der-ideen.de
www.land-der-ideen.de/MEDIA/12983,0.pdf

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► **KI 2008 – 31st German Conference for Artificial Intelligence in Kaiserslautern**

More than 230 scientists and researchers from around the world came together at the beginning of September for the 31st German Conference for Artificial Intelligence, KI 2008, in Kaiserslautern. The "KI" is the most important conference in the field of knowledge processing in the German-speaking region. In addition to several well-attended workshops and training tutorials, about 20 lectures, 30 poster presentations, and 6 innovative system demonstrators, participants could visit the accompanying exhibit to see the displays of current prototypes, robotic systems, and the latest developments in various areas of Artificial Intelligence. KI 2008 was a tremendous success for DFKI and the Technical University of Kaiserslautern.

In order to make the event even more interesting and to focus resources at TU Kaiserslautern, the 6th Conference for Multi-Agent System Technologies (MATES) was held in parallel to KI 2008. All registered participants were able to conveniently move between the two conferences.



The main program of KI 2008 included five sessions about the topics: "Machine Learning", "Planning", "Vision", "Reasoning", and "Information Retrieval". Three high-class guest speakers further expanded the agenda. Prof. Yuzuru Tanaka reported on his 15 years of research at the Meme Media Laboratory of Hokkaido University in Sapporo. Prof. Michael Wooldridge, University of Liverpool, as a joint speaker for KI and MATES, introduced the social choice theory and its application in the area of multi-agent systems. The presentation by Prof. Randy Goebel, University of Alberta, looked at the difficult subject of reducibility from a new perspective. There was also an industry session immediately preceding the poster and demo display, which enhanced the program with contributions from John Lefor (Microsoft) and Udo Bub (Telekom Laboratories).

2008's traditional conference dinner was held in the city's "Fruchthalle" and coincided with the celebration of the 20th anniversary of the founding of DFKI. Numerous prominent guests representing academics, business, and government joined DFKI for the evening in celebrating 20 years of successful research.



Besides DFKI, the event sponsors included several other notable companies like Microsoft, Deutsche Telekom, SAP, IDS-Scheer, living-e, and Springer Verlag.

Outlook KI 2009

KI 2009 is being organized for the period September 15-18, 2009 by Prof. Bärbel Mertsching of the University of Paderborn.

More information

<http://ki2009.upb.de>



future talk CeBIT 2009



Ideas, Results, Perspectives in IT Research
(Talks will be in German)

The "future talk" venue, located at the future parc (Hall 9, A54), is the key communications forum at CeBIT. More than 100 short lectures, live presentations, podium discussions, and project demonstrations offer excellent insights into the technological standards of the future.

In the context of the opening ceremonies, Prof. Wahlster will join Prof. Dr. Lutz Heuser, vice-president SAP Research, Dr. Wolf-Dieter Lukas, department head at the Federal Ministry of Education and Research (BMBF), Peter Möckel, managing director at Deutsche Telekom Laboratories, Prof. Dr. Dieter Rombach, Director of Fraunhofer IESE, and Dr. Andreas Schuseil, department head at the Federal Ministry of Economics and Technology, BMWi, in a discussion of the Internet of Things and Services, innovative business processes and economic opportunities.

FUTURE TALK PROGRAM
TUESDAY, MARCH 3, 2009 **CeBIT HALL 9, STAND A54**

Opening podium discussion
Future Web
11.45-12.30

From the Internet of Things and Services to innovative business processes

Podium discussion with panel members:
Prof. Dr. Lutz Heuser, SAP AG
Dr. Wolf-Dieter Lukas, department head at the Federal Ministry of Education and Research, (BMBF)
Peter Möckel, Deutsche Telekom AG
Prof. Dr. Dieter Rombach, Fraunhofer Gesellschaft
Dr. Andreas Schuseil, department head at the Federal Ministry of Economics and Technology, (BMWi)
Prof. Dr. Wolfgang Wahlster, DFKI

Moderator: *Reinhard Karger*, DFKI

Innovation alliance "SemProM" - A Digital Product Memory
13.00-13.15

SemProM - Products Keep a Diary
Dr. Alexander Kröner, DFKI

13.15-13.30
Products control their evolution - the intelligent factory of the future!
Florian Flörchinger, DFKI

Informatics Cluster of Excellence
14.20-14.40
Our World in a computer: Simulated reality instead of "Second Life".

Not just pretty pictures: specific planning guidance for various applications in bio-informatics, geo-informatics, city planning and cultural history is made possible by means of the integration of highly detailed and complex 3D-models, numeric simulations, semantic annotation as well as artificial intelligence methods.

Prof. Dr. Philipp Slusallek, DFKI

THESEUS - New Technologies for the Internet of Services
THESEUS Start-ups

15.15-15.25
tiqqer - startup for blog monitoring
Dr. Stephan Baumann, DFKI / tiqqer

15.25-15.35
SemVox - Semantic Technologies and Voice Solutions
Dr. Norbert Pfleger, SemVox

GPS support for real-time vehicle scheduling in logistics
16.40-17.00

Who? Where? Destination? Right now!
Boris Paul, Deutsche Post World Net, Technology & Innovation Management
Dr. Dirk Werth, DFKI

WEDNESDAY, MARCH 3, 2009

Ambient Assisted Living
14.00-14.20

Intelligent Assistants for Wheel Chair Users
 Based on the Xeno wheel chair by Otto Bock: Safety, braking, and driving assistants facilitate the trip; the navigation assistant chooses the path or the route autonomously; a head fitted joystick and natural language dialog facilitate interaction.
Dr. Thomas Röfer, DFKI

THURSDAY, MARCH 3, 2009

Innovations for Space Travel
12.00-12.30

Intelligent Robots for Extraterrestrial Missions
Prof. Dr. Frank Kirchner, DFKI

futureTainment

13.00-13.20
Discover Unexpected Connections
 How computers learn to find relationships by instance
Prof. Dr. Hans Uszkoreit, DFKI

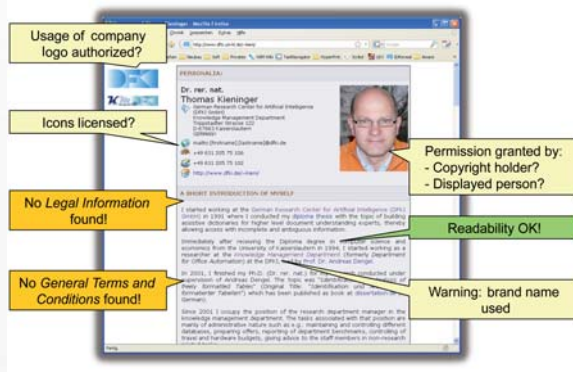
SUNDAY, MARCH 8, 2009

3GT - Girl Geek Get Together
12.30-13.30

3GT- Girl Geek Get Together
Nicole Y. Männl, NY DesignBeratung
Gesche Roy, DFKI / schuehsch.net

Program coordination for future talk CeBIT 2009:
Reinhard Karger, DFKI

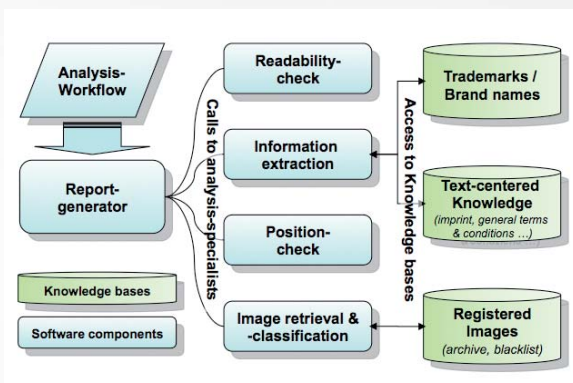
▶ AWARE – Automated Analysis Tool for Checking the Legal Conformity of Web Pages



An attractive photo downloaded from the internet for a homepage, the use of brand names in a text in order to increase the number of hits by the search engines, outdated information in the imprint...

Web pages carry the hidden risk of legal hazards, so that the owners or authors may wind up in the sights of professional admonishers, even when there are no business interests at stake and they are not aware of any wrongdoing on their part.

The AWARE automated assistance system is an analysis tool for checking the legal conformity of web pages, grounded on a web-based, service-oriented architecture. AWARE links web-mining technologies with specific legal expertise to enable a broad community of users to automatically review web pages in the context of legal conformity.



The purpose behind the user assistance software includes checking an internet presence for required content like the imprint, general terms and conditions, or data protection provisions, and also evaluating the content. Image-based retrieval processes can identify the use of images or even parts of images without any manual indexing and with a high hit probability. The images used are analyzed and their

legal status is checked. Possible copyright violations as well as the use of brand names in the text are duly noted. AWARE then produces a comprehensive report that lists all suspect content on the web page in a checklist format and informs the owner of items that require action.

AWARE is an interdisciplinary collaborative project, where legal subject matter experts work together with artificial intelligence scientists. Over the project life cycle – i.e., especially after the project has ended – it should be possible for the legal experts alone to adjust the integrated system to account for any changes in the law. For this reason, system developers have designed an architecture that strictly separates the algorithms and the knowledge based elements.

Other project partners:

- ▶ Europäische EDV-Akademie des Rechts (EEAR)
- ▶ e.Consult AG
- ▶ mineway GmbH

AWARE has been funded for a period of 18 months by the Federal Ministry of Education and Research (BMBF).

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Nepomuk – Semantic Context for Personal Files



Human thinking is associative in nature and is intuitively able to process the interrelationships between diverse information. The human brain connects single elements that it has perceived and memorized simultaneously, which enables humans, for example, to connect conference documentation with the speaker or a scheduled time. Such relationships are often very difficult to represent on a computer.

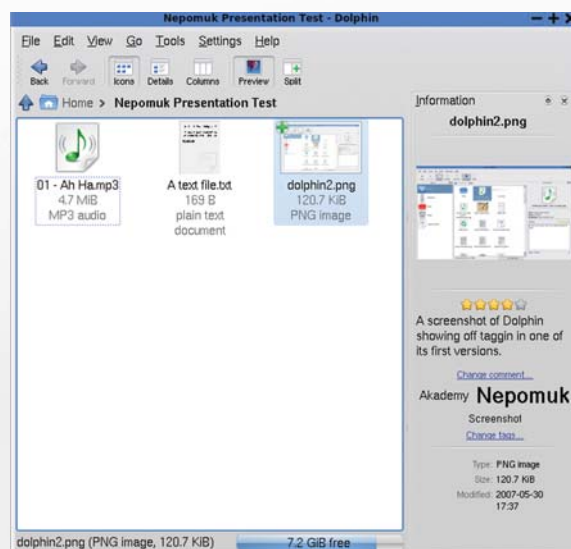
The NEPOMUK project has developed a work environment that supports personal information management with semantic technologies. The hidden knowledge behind the filing system and file content on the personal computer is first automatically transferred to an explicit "Personal Information Model" that links, for example, e-mail with contact data and other files on the hard drive. The user has the option to adjust these models to their individual preferences and work habits at any time. The links created between information and concepts are then used for subsequent filing and searches: content analysis algorithms produce suggestions about how to integrate new documents in the existing personal file system. If at some later time, for example, only the name of a contact person is recalled, the semantic network that has been created can find all associated documents.

Coordinated by DFKI, the EU-Project NEPOMUK was funded for a three-year period and has managed to link current technologies to create a standard, open solutions. Building on the W3C standards for semantic web, RDF and ontology, desktop operating systems are expanded with semantic interfaces to extend the respective linking functions using existing software like MS Office applications and browsers. This is an approach that raises the acceptance level of new technologies and reduces the start-up costs because familiar applications continue to be used. Open standards enable other market participants to offer their own services and programs based on this technology.

The findings are suitable for use with MS Windows, Linux, and Mac OS and are available as open source software. Already, a large part of the NEPOMUK technology has been integrated as standard in the popular KDE user interface for Linux and is now being delivered to millions of users. The open source reference implementation of the indexing software by Aperture.sourceforge.net has been downloaded more than 10,000 times from the internet and, since 2008, it is also part of the "SMILA" initiative of Eclipse.org for semantic indexing in a business environment.

Practical testing of NEPOMUK is being performed in case studies in the fields of biotechnology, consulting, industrial R&D as well as on community help desks, and development is continuing on commercial applications.

The recently established Open Semantic Collaboration Architecture Foundation (<http://oscaf.org>) coordinates additional work on the semantic desktop. DFKI offers customization of the open source software as a commercial service. Currently, the spin-off company "Gnowsis.Com" is being established to facilitate the commercial application of the results for the consumer marketplace and online.



Services offered by DFKI

Customizing the Semantic Web Platform for businesses, desktop and company research, individual process oriented knowledge management, contract research.

More information

<http://nepomuk.semanticdesktop.org>

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Social Media Sharing with ALOE

ALOE is a "Social Media Sharing Platform" developed under the design paradigm of Web 2.0, which will enable users to organize and exchange multimedia resources. Additionally, formal metadata sets of the most diverse formats can be associated with the resources.

With ALOE, it is possible to administer user groups and multimedia content, to place bookmarks and tags, and to progressively release resources and metadata (private/public/group). Resources are located through various searches and filter processes, and a ranking of the results is calculated on the basis of various criteria. Besides that, a web-service interface (SOAP) and functional feeds are provided.

The open and generic architecture of ALOE allows the use of formal and statistical descriptions of resources in various applications and contexts as well as user-generated information (like that characteristic for Web 2.0).

In a corporate environment, the ALOE system can be employed as a platform for the implementation of social (Intranet) portals. The system creates an opportunity to integrate existing content and applications; a social component provides the basis for the use of

"collective intelligence" methods, expert locating, as well as for establishing social networks and facilitating collaboration.

ALOE is used as a "Backbone of the Community" service in the European Union funded MACE Project (<http://www.mace-project.eu>) within the framework of the eContentplus program, and serves as the basis of C-LINK (<http://c-link.dfki.uni-kl.de>), a networking tool for conference participants.

More information
<http://aloe-project.de>

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eyeBook – Multimedia Reading

The DFKI eyeBook application successfully implements a context-dependent, interactive, multimedia combination of digital media like sounds or images with traditional text.

An eye tracker analyzes the reading patterns of the user to enable the system to provide the reader with multi-modal, context sensitive feedback related to the point in the text that is currently being read. For example, there may be sound effects, musical melodies, photos or color changes to correspond to the range of emotional context of the text. The type of multimedia feedback is defined over special annotations that are invisible to the user.



At CeBIT 2009, DFKI will be demonstrating several book chapters selected and edited for the eyeBook framework, enriched with multimedia content. In addition, the visitor can experience new applications in the area of entertainment courtesy of an innovative new prototype.

Besides the application possibilities in the entertainment industry and the publishing sector, the Department of Knowledge Management at DFKI is investigating how the application may be transferred to additional scenarios. Language-learning programs, edutainment, or various other types of text based information systems offer an exciting potential for future development.

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MoViMoS – Modular Visual Mobile Search

Digital cameras have almost completely taken over from their analog predecessors. Even the majority of cell telephones now have an integrated, high-resolution camera. The scope and diversity of image data creates broad new challenges in use, administration, and storage. Photos must be quickly located or grouped according to contextual criteria.

Context-based search has been an ongoing topic of research for several years, yet the technology today is only integrated in commercial applications on a case-by-case basis and is not available to the general public. MoViMoS represents a bridge between the prototype lab systems and the commercial deployment of context-based image search.

The core of MoViMoS is an efficient and scalable component design for the image retrieval system. New processes for classification extraction have been integrated with existing context based search methods in the form of separate modules for more efficient similarity-based searches. MoViMoS provides different options for use: travelers can use it as a tourist information system to learn more about photographed points of interest: The users can send photos from their cell phone cameras to the system and obtain feedback about the image context. MoViMoS can also serve as the basis for various other applications with both PC based and mobile user interfaces.

The modular architecture allows for the customization of MoViMoS systems to meet the special requirements of various conditions. A search can be performed for colors, textures or objects and different search results will be



displayed depending on the selected combination of modules.

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Image-based Recognition of Printing Techniques

The quality of modern digital image processing and reproduction technologies has made it quite easy for users to create high quality forgeries of documents using everyday ink jet or laser printers in just a short time. Consequently, an exciting approach to the identification of counterfeits is the ability to detect the process used to create them.

A major challenge in this effort is the discrimination between laser prints and photocopied documents. Both printing principles are nearly identical; they use the principle of an electrostatic charge to transfer the toner. The only suitable difference for analysis of photocopies with direct laser prints occurs at the time of scanning where the sharpness of the copied edges may be compared.

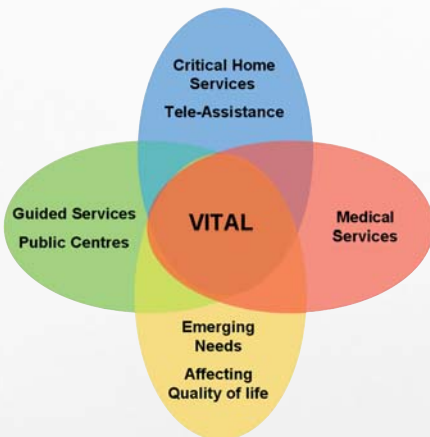
The difference between ink-jet and laser printing prints is much clearer. In an ink-jet print, tiny, often microscopic flecks of ink are left in the spraying process around the area of the printed objects. Additionally, the sharp-

ness attainable at the edges with an ink jet method is significantly less than with the laser print.

A process has been developed using the methods of digital image processing and pattern recognition to differentiate the three print categories: laser, ink jet, and copy. The scanned document is transformed into a frequency space using DCT (Discrete Cosines Transformation), and the result is used as the basis for analysis. In this way, it is possible to identify the underlying print technology of digitalized documents with greater than 90% accuracy using a low-resolution scan of only 400 dpi.

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► **VITAL – Comprehensive Services to Assist the Elderly**



The goal of the European research project VITAL is to develop innovative technologies, platforms, applications, and services that significantly improve the quality of life for senior citizens.

VITAL is intended to go beyond the traditional assistance services and provide support at all times in any location within the framework of an integrated home environment. This includes the use of multimodal user interfaces that will, for example, use speech and gestures to identify the needs of the user and supply expanded audio visual content without greatly



restricting the individual's activities. Almost any end device such as a television or a mobile phone can be

used to insure the availability of agent-based VITAL-services, which include intelligent information services, interpersonal communication assistance, consulting, support, entertainment, and continuing education.

Users can benefit from the use of the VITAL platform in a familiar environment throughout every phase of life without having to change the end device. The appropriate services are selected according to need and can be expanded over time.

The following research fields form the basis for the major VITAL innovations:

- ▶ Agent systems that interactively deliver personalized information and services
- ▶ Speech recognition technologies that enable natural language dialogue with a computer and their automated summarization
- ▶ Intelligent user interfaces based on existing devices that are customized for the needs of the elderly.

VITAL uses state of the art research in the following topics of today's information society: anywhere / anytime computing, intelligent agents technology, true personalization, mobile and TV applications, active systems, natural speech processing, location sensing and advanced video services.

The project falls under the European Commission's Sixth Framework Program and is funded by a total of € 2.9 million for a period from January 2007 to September 2010. There are a total of nine partner institutes and companies participating in the project and located in Germany, England, France, Italy, Portugal, Spain, and the Czech Republic. DFKI is responsible for the project coordination.

More information
www.ist-vital.org

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Imprint

Issue 23, February 2009, ISSN 1615-5769

Published by: German Research Center for Artificial Intelligence GmbH (DFKI)
 Editorial staff: Heike Leonhard, Michael Bruss, Christof Burgard, Ute Ihlenfeldt, Reinhard Karger, Franziska Martin, Helga Riedel, Gesche Roy, Udo Urban
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 Photos: DFKI, unless otherwise noted.
 Layout, Graphics: Christof Burgard; Production: One Vision Design; translated by Glenn Peach
 Responsible: Heike Leonhard, Corporate Communications
 Responsible for the translation: Michael Bruss, Corporate Communications
 Frequency of publication: Semi-annual, Newsletter online: www.dfki.de/newsletter

3-D Simulation for Architects: Building to Fit the Natural Surroundings

Nowadays, more and more buildings are no longer being drafted on a drawing board, rather, they are a product of computer-aided design software. What is still missing so far is a realistic, interactive presentation of the new construction in its future setting. Computer scientists in Saarbrücken have now developed a visualization technique that enables architects to show complex models of their building designs perfectly fitted into the landscape.

In order to simulate landscapes in a realistic fashion on the computer, the Saarbrücken team draws on data provided by the land registry offices. This information is supplemented by photos and topographic data produced with airborne laser scanners employed in aircraft and using the standard five measuring points per square meter, which guarantees for a highly accurate data base. This data are then integrated by computer to create virtual towns and cities in a 3-dimensional countryside. Then, on the monitor or a stereoscope projection screen, buildings can be manipulated in 3-D representations – rotated, turned, circumnavigated, and even explored from the inside. In the event that the design of the new construction is unattractive with the surroundings, or shade is cast onto the neighbor's garden, it can be modified quickly with a click of the mouse. Thanks to the three-dimensional and true-to-nature representation of the environment, the architects and landscape planners of the future need not worry about expensive plaster models.



The basis for such exact imaging is the so called real-time ray tracing, an interactive visualization technology, which Prof. Philipp Slusallek and his team have made ready for the commercial market over the past few years. As a result, new virtual worlds have been opened for designers, in which mirroring, reflections, and light refraction can all be created with great realism. The graphic design programmers have created a perfect model of the Saarland University campus for a presentation at CeBIT 2009, fitted with the new building for the department of informatics as well as the planned annex to the DFKI building into their future construction sites. Visitors



to the trade show can interactively explore the campus with 3-D glasses on a large viewing screen.

In another research project, the Saarbrücken scientists are working on ways to integrate semantic information into the virtual maps. Local communities have data bases, e.g., route plans, traffic signs, sewerage systems or even trees, which until now have been shown only as symbols on the 3-D maps and have not reflected the actual geometry. In this context, new methods of visualization are needed to make this data available in a 3-D presentation. Using semantic input it will be possible, for example, to show the effect of historical changes to buildings over decades in a time lapse display – for a virtual journey through space and time.



More information and photos
<http://graphics.cs.uni-sb.de/vc>
www.informatik-saarland.de

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► Competence Center eLearning – Getting Involved with the Region

The federal state of Saarland is a pilot region for the "Companies for the Region" program, a CSR (Corporate Social Responsibility) initiative of Bertelsmann Foundation. Companies participate within their regions with projects in the areas of education, integration, and employment.

On February 4, 2009, Elke Rieder and Andre Günther represented DFKI's CcEL – Competence Center eLearning at the national conference and the official ceremonies for the "Companies for the Region" initiative in Berlin. As part of the ceremonies, participating companies presented position papers on the subject of social engagement to Peter Müller, President of the Federal Council (Bundesrat) and Minister President of Saarland. In his opening remarks, Peter Müller emphasized the importance of joint acceptance of responsibility: "In Saarland, we overcome barriers between governmental policy and business by focusing our commitments in order to attain common goals that serve both public weal and business interests."

CcEL introduced the "New Technologies in the Classroom" project as part of the conference agenda. Under the direction of Ralf Zastrau, Chairman of the Board of nanogate AG, CcEL developed an "Information and Contact Exchange" for schools, companies, and institutions of higher learning. Here, opportunities and offers of cooperation like internships, eLearning classes, or "Lab Days" can be announced. CcEL itself placed one specific offer in the Info and Contact Exchange: a low-level introductory course called "3-Steps to e-Learning".

The next presentation of major projects by businesspeople, schools, kindergartens, and other institutions throughout Saarland will take place under the framework of the "Summer of Science" scheduled for the period June 20–26, 2009 in Saarbrücken. Among the exhibits this week, CcEL will present the "Self Learning Center Saar", (SelbstLernZentren Saar).

CcEL strives to strengthen the ties between schools and businesses, but is also active in establishing networks and forging closer cooperation among research, educational institutions, and companies. The educational network "SaarLearnNet" (SaarLernNetz) was created eight years ago under the direction of Dr. Josef Burgard and has operated and expanded steadily ever since. Over the past three years, three new institutions for continuous education have been established in Saarland: the Self Learning Centers at Saarbrücken, Merzig, and St. Ingbert. As a result, a new type of learning – self-paced learning – has attained a place of special importance in the region. Students determine on their own when, where, and how long they learn, with the support of professional learning consultants if necessary.

CcEL thinks of itself as a pilot development and test platform for educational technologies and as a transfer facility that introduces new technologies in the field of education and makes them accessible to a wide public. CcEL provides an opportunity to all interested parties to test the learning technologies it develops on selected target audiences and to test them in a variety of different educational contexts.

Background:

Liz Mohn, Vice Chair of the Executive Board of Bertelsmann Foundation, founded the "Companies for the Region" initiative in March 2007. The aim of the initiative is to actively support the various corporate activities and introduce them to a broad public. Bertelsmann Foundation supports the regional CSR network, "Partners in Social Responsibility" to assist businesses to bundle and network their local involve-



Minister President Peter Müller and the Saarland delegation

ment. Saarland was chosen as one of three pilot regions. The theme of Saarland's business community "Youth, technology, and career!" operates under the motto: "Invest in the future – Embrace technology!" The partners in social responsibility receive additional support from Saarland's Ministry of Economy and Science.

More information

www.saaarlernnetz.de

www.unternehmen-fuer-die-region.de

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SemVox, one of the DFKI spin-off companies, will be using its ODP framework to demonstrate a new generation of natural language dialog systems at CeBIT 2009. SemVox has created a sample application called FlexMedia to demonstrate the performance capabilities of ODP (Ontology-based Dialog Platform) technology and to give visitors a preview of the future of entertainment. FlexMedia provides the user with an innovative, multimodal interface to any media content such as film or music.

Supported by the ODP framework, semantic processes intuitively and naturally allow access to even the most complex functions. The user only has to speak his wishes out loud, for example, "Play the album 'Kind of Blue' by Miles Davis" or "Recommend an action film".

The system interprets this input, executes the desired action and, in the process, even considers the user's

SemVox – Natural Interaction

personal taste and preferences in music or film. In this totally new way, FlexMedia successfully and in a totally novel way brings together information from online-sources, like shop systems or information services, with local media content, in order to create the next generation entertainment platform.

More information
www.semvox.de

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Rüdiger Dabelow

Rüdiger Dabelow is the head of the Center for Human-Machine Interaction at DFKI and manager of the technology initiative SmartFactory^{KL}.

What do you see as the application potential of your research?

The potential of the individual Information and Communication Technologies (ICT) that is already widely established for the home and office environment

is now being exploited for the production environment. For example, on the basis of wireless communication in combination with positioning systems, an entirely new range of solutions in equipment operations will be realized

When did your interest in artificial intelligence begin and how have AI processes changed since that time?

During my college studies, I already got in touch with simulation tools used as decision aids in production planning and scheduling systems. Now, agent-based AI approaches are being used in automation technology where they contribute to the creation of flexible networks of autonomous, self-organizing components.

What are the challenges and opportunities for AI systems today?

Efficiency is the key word today, especially in the area of industrial production. AI systems help to design resour-

DFKI-Interview: Rüdiger Dabelow

ce efficient processes and facilitate the safe operation of ever more complex production systems.

What do you enjoy doing besides working as a research scientist?

Outdoor sports like walking, climbing, or snowboarding are relaxing and balance out my professional activities.

Do you see any parallels to your professional life in this regard?

Yes, from time to time, I also face exciting challenges in my leisure time that I find can be mastered with perseverance, skill, and the joy of discovery.

What are your current projects?

Besides my responsibilities in the SmartFactory^{KL}, I also work on the SemProM (Semantic Product Memory) project.

News in Brief

FROM THE KNOWLEDGE MANAGEMENT DEPARTMENT

Prof. Dr. Andreas Dengel, Head of the Knowledge Management department at DFKI, is a member of the working group for the evaluation of social and economic data of the *Wissenschaftsrat* (German Council of Science and the Humanities) as an external expert. The *Wissenschaftsrat* is an advisory body to the federal and the state (*Länder*) governments on issues regarding the content and organizational development of scientific, research and university sectors.

Dr. Thomas Roth-Berghofer is a research scientist assigned to the Knowledge Management department at DFKI. He has been appointed to the editorial staff of the book series "Lecture Notes in Informatics (LNI)" published by the "Gesellschaft für Informatik" (GI), where he will serve for a term of three years in the GI "Artificial Intelligence" department.

FROM THE CENTER FOR HUMAN-MACHINE-INTERACTION (ZMMI)

In July 2008, Prof. Dr. Detlef Zühlke, Director of ZMMI, was invited to be a guest speaker at the plenary session of the 17th World Congress of the International Federation of Automatic Control (IFAC), where he has been chairman of the Coordinating Committee 4 (Mechatronics, Robotics, and Components) since 2008. In November 2008, Prof. Zühlke was the keynote speaker at the MESA International 2008 Plant-to-Enterprise Conference in Prague. At both events, the ZMMI SmartFactoryKL was presented to a broad audience and Prof. Zühlke provided an overview of current projects.

FROM THE INTELLIGENT USER INTERFACES LAB



l.-r. Dr. Raymond Perrault, Director of the Artificial Intelligence Center at SRI International; Prof. Derek Corneil, Department of Computer Science, University of Toronto; Prof. Wolfgang Wahlster; Dr. Seamus O'Shea, Vice-president (Academic) and Provost, University of Lethbridge; Prof. Dr. Richard E. Taylor, Stanford University; Prof. Randy Goebel, President and CEO of iCORE; Prof. Dr. Eric Georg Manning, Computer Science, University of Victoria; Dr. James Gosling, Chief Scientist, Vice President Sun Microsystems; Annette Trimbee, Deputy Minister of Advanced Education and Technology; Prof. Ian Blake, Electrical and Computer Engineering, University of Toronto; Prof. Simon Kasif, Biomedical Engineering, Boston University; Terry Ross

IRAC (Informatics Research Advisory Committee) is the advisory committee to the Canadian government's iCore (Informatics Circle of Research Excellence) program. The iCORE was created to foster the expansion of competence in the field of informatics in the Province of Alberta, Canada, for example, by the award of grant funding to outstanding professors or students. The council, composed of a select group of scientists and industry experts from around the globe, advises iCore on issues concerning the future direction of research. Prof. Wahlster was appointed to the council in 2004. In January 2009, IRAC met in Palo Alto, California.

ACCEPTANCE OF THE MARKUP-LANGUAGE EMMA BY W3C

On February 10, 2009, EMMA – Extensible MultiModal Annotation, after having been significantly advanced by the Intelligent User Interfaces Lab at DFKI, was officially published by W3C (World Wide Web Consortium) as a new standard markup-language (XML) for multimodal access to the Web. This global standard was promoted by DFKI through projects like SmartWeb and THESEUS.

The EMMA standard plays a major role in the development of rich mobile applications, where it simplifies the adaptation of more input and output modes in mobile scenarios. For example, mobile telephones are currently capable of speech or text input. EMMA will make it easier to develop applications that interpret natural language, handwriting, or gestures as the input mode or even combinations of all three.

For more information about EMMA, see: www.w3.org/TR/emma

„QUANTUM INTERACTION“ SYMPOSIUM AT DFKI IN SAARBRÜCKEN

The global research effort in the field of quantum physics in recent years has not only achieved major advances towards quantum computing in a future quantum internet. It has also found application in the research and development of other scientific disciplines like biology, sociology, cognition, micro economics, artificial intelligence and information retrieval.

The international symposium series, "Quantum Interaction" (QI) provides a common forum for the presentation and discussion of current findings from the interdisciplinary study of quantum-based methods and applications in the various fields of scientific research. Following successful conferences at Stanford (USA) and Oxford (UK), the third international QI-2009 symposium will be held from March 25-27, 2009 at DFKI Saarbrücken.

More information about:
Symposium QI-2009 is available online at:
www.dfki.de/~kluschi/qi2009.



WE ARE PLEASED TO PRESENT THE FOLLOWING PARTIAL LISTING OF OUR STAFF'S RECENT SCIENTIFIC PUBLICATIONS

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Kaiserslautern Site

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.

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DFKI GmbH is managed by Professor Wolfgang Wahlster (Chairman and CEO) and Dr. Walter G. Olthoff (CFO).

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DFKI project office Berlin

as well as the associated Center for Human-Machine Interaction (ZMMI) (Prof. Dr.-Ing. Detlef Zühlke).

The official opening of the DFKI project office Berlin in 2007 signals the further expansion of existing partnerships within

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



Saarbrücken Site

With an overall annual budget in 2008 of more than € 27 million, the previous year's record result of € 23 million was surpassed. Currently, DFKI has 338 employees and 307 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.

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 more than



Bremen Site

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 2008. 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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