NEWSLETTER DFKI

1/2010

RESEARCH LABS

KNOWLEDGE MANAGEMENT

ROBOTICS INNOVATION CENTER

SAFE AND SECURE COGNITIVE SYSTEMS

INNOVATIVE RETAIL LABORATORY
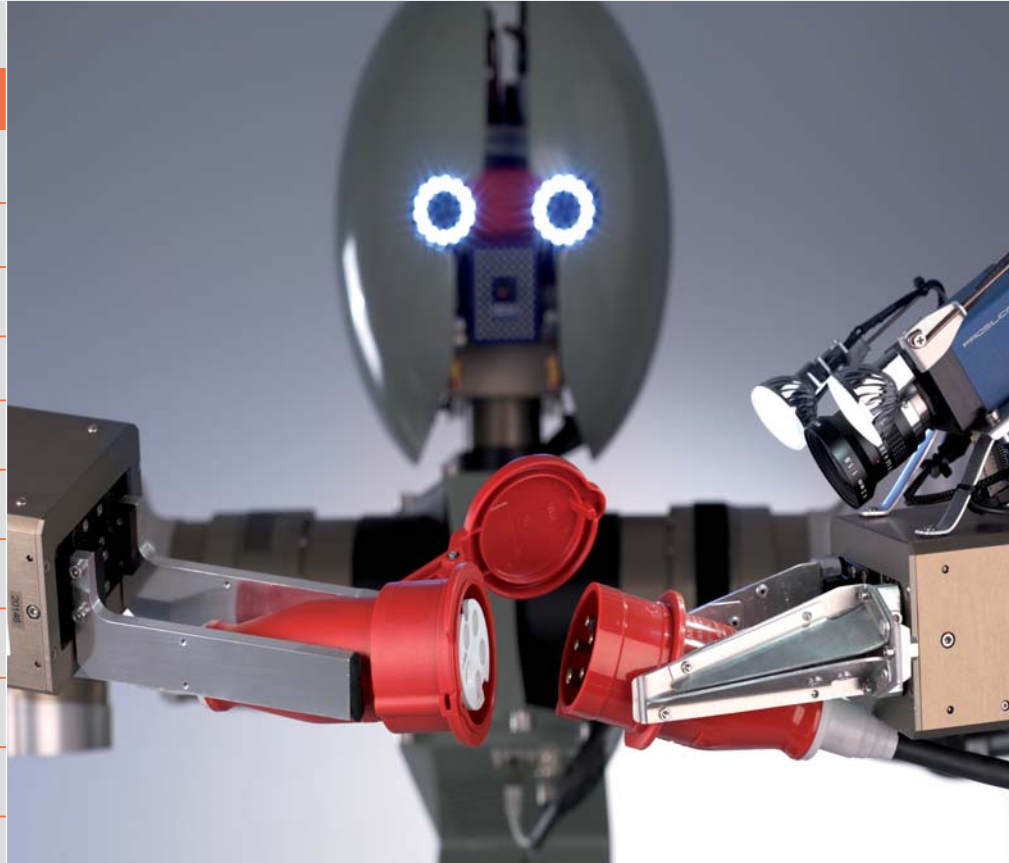
INSTITUTE FOR INFORMATION SYSTEMS

AGENTS AND SIMULATED REALITY

AUGMENTED VISION

LANGUAGE TECHNOLOGY

INTELLIGENT USER INTERFACES

INNOVATIVE FACTORY SYSTEMS

Software Cluster

EIT ICT Labs

DFKI Wins High-Class Research Competitions

New DFKI-Shareholder Intel

DFKI at CeBIT 2010

365 Landmarks in the Land of Ideas 2010

Seeing means understanding: simulated worlds and virtual prototypes

Modeling and simulation allow for virtual prototypes and reliable predictions. Future concepts become more tangible, citizens are better informed before making decisions. Ideas can be developed and discussed as if they were already brought into being.

Projects are being planned - but visualization makes them imaginable: the car of the future, the Saarbrücken city riverwalk, a new plane, the virtual reconstruction of historic places. At the DFKI visualization center, a living lab of DFKI, the latest techniques of computer graphics research are being implemented, tested in real life and made available for the public.

More efficient calculation and simulation methods, the availability of highly parallel hardware, 3D input devices and displays have significantly pushed the use of simulated reality in the industry. At DFKI we're already one step ahead, combining the latest visualization techniques with the methods of artificial intelligence. The realistic depiction of machine behavior as with machines and in traffic or the precise simulation of lightening support the training in non-existing surroundings or in dangerous situations.

DFKI-Visualization Center
Campus D3 2
66123 Saarbrücken
www.viscenter.de

Opening
DFKI-Visualization Center
Day of the Living Lab

November 5, 2010

www.dfki.de/web/aktuelles/ort-im-land-der-ideen

Intel and DFKI Cooperate for the 3D-Internet of the Future

Intel, the world market leader for semiconductors, is now a shareholder of the German Research Center for Artificial Intelligence (DFKI). In December 2009, Intel joined the circle of industrial partners comprising among others BMW, Daimler, Deutsche Messe, Deutsche Post, Deutsche Telekom, EADS Astrium, Empolis, Harting, IDS Scheer, Microsoft Deutschland, SAP and Ricoh.

In May 2009, Justin Rattner, Director of the Corporate Technology Group and Intel Chief Technology Officer, had already visited DFKI for the opening of the Intel Visual Computing Institute (Intel VCI). On December 9, 2009, Joseph Schütz, Director Microprocessor & Programming Research, VP Intel Labs, Intel Corporation signed the contract for the acquisition of a DFKI company stake.

Prof. Wahlster, Joseph Schütz, Minister Dr. Hartmann

"We are excited about the opportunities for networking and collaboration with DFKI's scientists on a broad research agenda, including computational statistics, interface and language technologies, among others," said Joseph Schütz. "There are many research synergies between us, and we are looking forward to working closely with DFKI."

"The acquisition of a DFKI company stake by Intel is proof for the economic and scientific significance of DFKI. It is also a success for the Saarland, once more attesting its vibrancy as a highly attractive region for
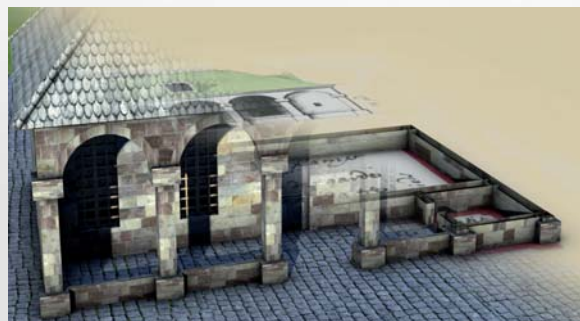
Visualization of the historic fortified city of Saarlouis

Information and Communication Technologies, both nationally and internationally. The interlocking of basic research and application orientation on the campus of Saarland University is a role model. That's why the Saarland supports the expansion of DFKI with a 50% funding of EUR 2.25 million from European structural subsidies, and that's why Intel gets involved with DFKI, and together with the University they bear the Intel Visual Computing Institute," said Dr. Christoph Hartmann, Minister for Economic Affairs and Science of the Saarland.

"We are especially proud of the fact that Intel decided to commit themselves to this innovation alliance with DFKI. For DFKI, Intel as a cooperation and project partner is the ideal complement to the hitherto existing circle of shareholders," said Prof. Wahlster, CEO of DFKI. "DFKI-innovations can now be realized in commercial applications and brought to the consumer market even easier. Joint areas of interests are, among others, visualization and especially the 3D internet of the future, where 3-dimensional worlds can be experienced."
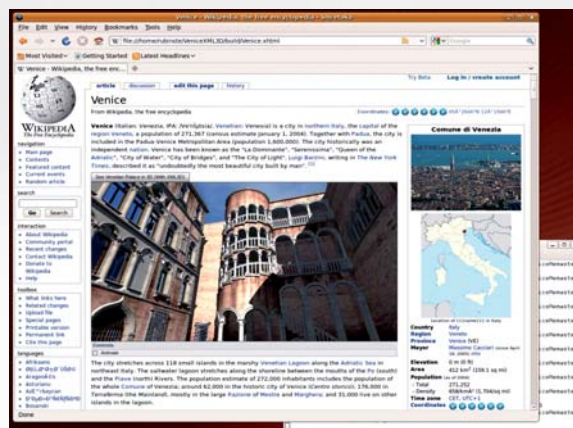
3D Internet in the Firefox Browser

"Together with Intel DFKI wants to further explore the basic technologies for the 3D internet, additionally dynamizing the development in Information Technology. DFKI and Intel employees will work hand in hand at DFKI Saarbrücken," said Prof. Slusallek, head of the research department Agents and Simulated Reality at DFKI and one of the initiators of the Intel Visual Computing Institute.

Rolland – A Safe Wheel Chair with Driving Assistant
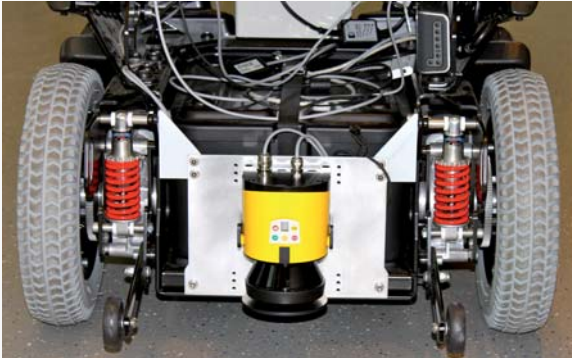
A driving assistant that applies the brakes when approaching an obstacle or maneuvers around it, controlled simply by head movements – based on the Xeno wheel chair developed by Otto Bock Mobility Solutions, DFKI designs and evaluates intelligent assistants to support wheelchair users. For this purpose, Xeno is equipped with laser scanners, rotational sensors for the power drive as well as an onboard computer. The supplemental components are installed in a manner that avoids impairments to the utility of the wheelchair in comparison to its series production cousins.

Rolland checks for potential obstacles fifty times per second and adjusts speed and directional data appropriately. In the event the user wants to approach an object, Rolland does not force a detour but simply slows the chair down.

Besides the standard joystick, the driving assist package also enables the use of a new control device, the so called head-joystick. The wheelchair user can steer by simply nodding the head and, if maneuvering in restricted space, the assistant can take over the fine control. This provides wheelchair users who are no longer able to use a joystick with an alternative to the more uncomfortable chin control.

The T2-[Rolland] Project "A Safe Wheelchair with Driving Assistance" is funded by the German Research Foundation (DFG) under the special SFB/TR 8 "Spatial Cognition" research topic.

Project partners
Otto Bock Mobility Solutions
Friedehorst Foundation

More information
www.baall.net
www.sfbtr8.spatial-cognition.de

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CeBIT HALL 9, STAND B40

iWalker – Intelligent Assistant for Wheeled Walkers

Find your own way swiftly and safely – explore unknown paths with confidence: the physical and cognitive abilities necessary for these basic skills are often significantly diminished with advancing age, or the onset of an illness or an accident. DFKI, in collaboration with the Catalonian University of Technology (UPC), is developing an intelligent assistant for rollators to compensate for these deficits.

The intelligent iWalker is a modified standard rollator. Brushless rotor wheel hub motors with electric brakes replace the rear wheels. A laser scanner recognizes obstacles in the path or in the vicinity of the rollator. A Netbook-PC captures the sensor and measurement data from the rotor motors and converts it into action.

The Mobility Assistant is an application of the iWalker project. It brakes one or both wheels, in response to the situation, in order to avoid or come to a stop ahead of an obstacle, for example, when transiting a doorframe. The user senses the necessary direction to be taken in order to avoid the obstacle, but retains full control as iWalker can-

not move independently. However, when a handgrip is released, the rollator will brake itself so as not to roll away. This also reduces the risk of a fall by providing a stable object which the user can hold on to for support with just one hand.

The iWalker is being developed and funded as part of the SHARE-it (Supported Human Autonomy for Recovery and Enhancement of cognitive and motor abilities using information technologies) project, which is under the umbrella of the 6th Framework Program of the European Union (contract no. 045088).

Project partners
University of Technology, Catalonia

More information
www.baall.net
www.ist-shareit.eu

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CeBIT HALL 9, STAND B40

Robot Soccer: The World Champions Are Coming!

Team B-Human from DFKI-Bremen is the reigning world champion in robot soccer! In the Standard Platform League of RoboCup 2009, B-Human thoroughly dominated the other teams at the world championship games in Graz, Austria. In eight matches, the team's scoring ratio was 64:1 – shooting more goals than the other 23 teams combined. The RoboCup is an international initiative to promote research in the fields of artificial intelligence and robotics. The goal of the RoboCup is to promote the development, before the year 2050, of a team of autonomous humanoid robots that is capable of defeating the human world champions in that year. 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 Nao robots selected for this purpose are

produced by the French company Aldebaran Robotics and are equipped with 21 joints: five per leg, four per arm, two in the neck and one in the hips. There are two cameras in the head and ultrasonic sensors in the chest to measure distances. Furthermore, the robot can measure the pressure force under foot and achieves a good sense of balance. "Thinking" is actually done in the head, where a 500 MHz embedded PC integrates the sensor data. At present, a team consists of three robots and the dimensions of the playing field are 6m x 4m.

The software programming for B-Human can be divided basically into four areas: Perception refers to the environmental awareness obtained from the cameras and ultrasonic sensors. This is the part where the ball, field markings and their intersection points, the goal, and the other robots are identified. However, because the aperture angle of the camera is restricted, at any given moment only a partial view of the surroundings is visually processed. The second area is concerned with information storage for modeling this data over time, in order to determine the robot's own position on the field, the position and speed of the balls as well as the position of the opponents. The third task involves the application of this information, in combination with data received via WLAN from teammates, to direct its own behavior, i.e., to decide what the robot is to do at what point in time. Finally, the execution of the defined actions is carried out through actual movements, i.e., the robot runs, shoots, or gets back on its feet if down on the field.

B-Human is a collegiate project managed by the members of the DFKI staff at the Department of Computer Science of the University of Bremen. The course requires students to work for a period of two years on the sub-

ject of robotic soccer and participate in international competitions. B-Human can be seen in contest at the German Opens RoboCup 2010 from April 15-18, 2010 in Magdeburg, and from June 19-25, 2010 at the world championships in Singapore.

There are also two 2-man-teams scheduled to compete at CeBIT 2010. The team that normally competes in the 2-legged Nao League will demonstrate ball control on a 12m² playing field. The Naos from DFKI-Bremen excel at precision ball passing and avoiding collisions with the other players. The result: The players on the B-Human team have no trouble outmaneuvering their opponents and confidently keeping control of the ball.

More information
www.b-human.de

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CeBIT HALL 9, STAND B45

SAMS Verification Environment: Safety Components for Service Robots and Driverless Transport Systems

A guaranty of collision safety is one of the statutory licensing requirements of a service robot and adherence to all applicable safety standards must be verified. SAMS (Safety components for Autonomous Mobile Service robots) is a safety algorithm for calculating speed-dependent safety fields.

The collision safety is provided by means of a touch-free scanning laser that monitors the safety fields. The safety fields' speed dependence, in contrast to currently available static solutions, offers a faster and more effective lane control in which brakes are always applied as late as possible, but as early as necessary.

The key to certification and guarantee for the safety is the formal mathematic modeling of the braking pattern that serves as the basis for the subsequent proof of correctness. TÜV Süd has validated conformity up to a Safety Integrity Level SIL 3 according to DIN EN 61508. For this project, DFKI developed a standards-based environment for the verification of MISRA-C programs which will be presented at Cebit 2010. This is an open-access program and therefore highly interesting for other developers working in safety-critical fields.

By employing formal methods already known in the area of security-critical systems, SAMS is exploring new and exciting territory in the field of robotics, especially service robotics, that promises high profit potentials. The practical results are of immediate use: comprehensive formal verification methods guarantee maximum reliability,

which also enables the verification and certification of other demanding algorithms.

The consortium partners DFKI-Bremen (lead), Leuze Electronic, and the University of Bremen are realizing the SAMS project with funding provided by the Federal Ministry of Education and Research (BMBF) under the government's innovation policy instrument "Service Robotics".

More information
www.sams-projekt.de
www.dfki.de/sks

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B-Catch – Visual Trajectory Analysis

One of the greatest challenges facing the continued development of humanoid robots is accurate hand-eye coordination. B-Catch is a collaborative project with the German Aerospace Center (DLR) to study the motion of several balls thrown in the air at the same time – from the perspective of an observer in motion – and then, to determine the trajectories based on the observed flight paths. The methods developed in the project will be integrated into a humanoid robot that will be employed to catch balls in mid-air. In addition to these technical requirements described in terms of a "sports" application, a deliberate aim of the project is also to address algorithmic issues in real-time image processing.

In addition to the accurate determination of the observer's proper motion, it is also essential for the precise capture of the curved trajectory that the image processing captures the ball exactly in the projected image. An important subgoal of the project is to use the existing knowledge of the flight path properties in order to combine image processing and ball tracking in a common probabilistic approach which promises more reliable ball tracking under difficult conditions. In addition to the dynamics of a ball flying through the air, the dynamics of bouncing, rolling, or stationary balls can also be modeled, and the system is expected to automatically evalu-

ate which model best approximates the observed patterns of motion. This extension makes it easier to recognize the balls proper or to project only trajectories of flying balls.
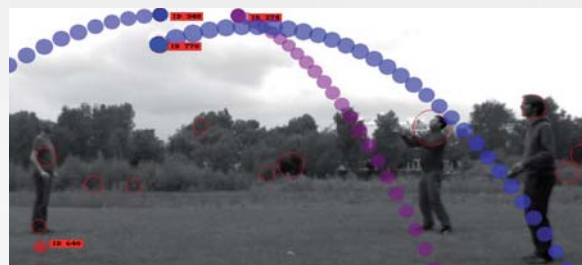
The B-Catch project is sponsored by the German Research Foundation (DFG).

More information
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SeeGrip – New Manipulator System Secures Access to Deep-Sea Resources

The increasing scarcity of raw materials near the earth's surface is sparking a growing interest in the extraction of resources from new sources, located at ever greater depths on the sea floor. The newest generation of oil drilling platforms is already anchored at depths of approximately 2400 meters. So-called Remotely Operated Vehicles (ROVs) have to perform the construction and maintenance of the required pumping systems and the underwater welding of pipelines, as not even deep-sea divers can reach these depths. Also the machines that harvest manganese nodules directly from the sea floor require maintenance and repair that can only be performed by the manipulator systems carried by ROVs and AUVs (Autonomous Underwater Vehicles).

The next generation of underwater grippers is being developed at the Robotics Innovation Center (RIC) of DFKI Bremen in project SeeGrip. These will provide the critical support necessary to accomplish the challenging tasks to be encountered in the future in the offshore industry, as well as in the field of ocean floor research. The SeeGrip underwater manipulator, comprised of mul-

tiple units, is able to perform form and force manipulation tasks that require complex geometries. The integrated tactile sensors provide direct feedback with information about the objects that come into contact with the manipulator. Even under conditions of poor visibility, handling procedures are possible by touch, and better efficiency is achievable when manipulating objects because of the tactile feedback.

Project SeeGrip is funded by the Federal Ministry of Economics and Technology (BMWi) on the basis of a resolution by the German Bundestag.

More information
http://robotik.dfki-bremen.de/en

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CeBIT HALL 9, STAND B45

The Digital Fitness Trainer

Being active and staying fit requires a balanced amount of physical activity in order to maintain vitality and health as we grow older. Fear of injury, or simply the uncertainty about how much we can or should do often limits the training possibilities for the elderly.

The development of a technical assistance system to facilitate and analyze physical activity in a home environment is the aim of the European PAMAP (Physical Activity Monitor for Aging People) project. The elderly will be encouraged in this way to maintain a healthy activity level in their own familiar surroundings. The attending physician is being provided with what he needs for an early diagnosis, as well as with the infrastructure to support in-home therapies.

DFKI will introduce the PAMAP project and the initial findings from the Augmented Vision department to the public at CeBIT 2010. The system demonstrator has been

specially designed to support exercises for the functional rehabilitation of the upper body. Inertial motion sensors attached to the chest and arm supply basic data, which, in connection with a biomechanical model of the upper extremities, "reads" the exercise movements and extracts the relevant parameters like frequency, amplitude, and range. The system then generates feedback based on these evaluations. Similar to a fitness coach, it can provide encouragement to the user, correct the movement, or signal a warning of overexertion and, in this way, teach proper execution of the exercise. Motivation is provided by clever elements on the control panel of the PAMAP demonstrator and a virtual character that mimics the recorded arm movements. Visitors at the CeBIT future parc can test the system.

More information
www.pamap.org

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CeBIT HALL 9, STAND B45

Embedded Systems and Digital Assistants –
The SemProM and INTAKT Research Projects

DFKI and its consortium partners provide a technological vision of the future: the Internet of Things, the potential of semantic product memory, and other ideas developed under the framework of the SemProM (Semantic Product Memory) project, funded by the Federal Ministry of Education and Research (BMBF).

Complex everyday routines can be safely and intuitively managed through a combination of digital assistants and embedded systems. The SemProM consortium, headed by Prof. Wahlster, will present the latest findings and current applications at the CeBIT 2010 BMBF stand (Hall 9, B40) under the motto "Ambient Assisted Living 2020". The "Demo Parcours" is the product of a cooperative effort together with the Innovative Retail Laboratory (a joint initiative of DFKI and GLOBUS SB-Warenhaus Holding), and INTAKT (Interactive Avatar Communications Technology), a BMBF consortium project managed by Charamel GmbH.

The CeBIT scenario consists of several stations at which the visitor receives the support of digital assistive systems in the supermarket of the future: from the first moments after entering the store to the moment of consumption – help is there for product selection and check out, and even for care of the products during the trip home. The consumer can interact with goods of various categories with the aid of embedded systems, which proactively inform the shopper about features and proper use by means of multiple media. Virtual characters convey product information in dialog form and their natural manner helps to reduce user inhibitions in using such high-tech systems. The technology is being devel-

oped within INTAKT and integrated in SemProM. Thanks to the use of embedded systems, these computer-aided services fit seamlessly into the normal routines of the consumer. In a customized format, even the individual user profiles are taken into account, for example, personal preferences, allergies, or immediate destination.

Virtual Characters as Sales Consultants

At the first station, visitors encounter an assistive system that uses embedded sensors for activity recognition in a shopping scenario. Virtual characters act as "consultants" and facilitate the shopping process. A merchan-

dise expert informs the customer about the product properties, while a personal digital assistant manages the shopping list directly from the shopping cart and warns the consumer about possible food intolerances. The two assistants communicate with each other and with the customer. The system obtains all information from ontology-based digital product memories. If a product on the list is not stocked by the supermarket, an alternative is recommended.

Mobile Product Information

A mobile shopping assistant is always nearby while the customer is shopping and provides supplemental information via a mobile phone. A special reader identifies the merchandise and through the integration and assessment of product-related services, provides the shopper with information and product evaluations such as the eco-balance or the compatibility of a high-tech

device with the multimedia environment at home. The customized user profile can be adjusted dynamically and set relative to the properties of selected product memories. The operation of the mobile shopping assistant is characterized by minimal interaction. Products are indentified intuitively "at the touch of a button" and the most incisive news is presented in a clear overview, so even senior citizen groups benefit from the mobile shopping assistants.

Easy Checkout

Merchandise is paid for at the checkout without the bother of transferring and repacking. Readers capture the RFID tag data provided on the products and display it on the screen. The actual touch-free payment transaction follows with the car key, which stores credit card data in addition to the shopping list and the personal profile. On the basis of this information, additional services may be added at a later time.

SemProM-Car-Assistant

When the customer packs the groceries into the car, a digital assistant recognizes the products and proactively offers new services. For example, it issues a reminder that a product that was bought has not been put into the car and perhaps was forgotten at the checkout. If frozen goods were purchased, the consumer gets a notice of the latest time of arrival at home, calculated using current traffic and vehicle conditions, so as to avoid endangering the shelf life of the foods. The software to integrate newly purchased electronic products with existing equipment in the car is installed automatically and operation conveniently responds to an intuitive gesture.

Digital product memories increase the transparency of service performance in the workshop: what repair parts were used and invoiced, and whether they meet the vehicle specifications. This guarantees that only those parts that meet the vehicle specifications are actually used. This technology even simplifies the increasingly complex operation of the vehicle comfort functions, like the seat position or climate and ventilation controls. Simple gestures can be used to store personal preferences in the key ring for future application in the vehicle. Complicated control menus will soon be a thing of the past.

SemProM-Scenario in Open Field Testing for the New ID Card

In the healthcare sector, digital product memories assist patients in managing their medications and admonish them of possible dangers. Blister packaging with product memories, in combination with the product memories of other medicines or foods, will introduce a whole new range of services and applications. This simplifies the job of doctors, pharmacists, healthcare personnel, and patients in recognizing and interpreting the potential side effects.

The protection of sensitive data is being guaranteed by means of an innovative role- and authorization concept for different user groups. These are the perfect application scenarios for the new ID card (nPA), and SemProM is one of the first projects to take part in the open application test conducted by the Federal Ministry of the Interior for this technology with a concrete scenario. On that account SemProM makes use of the certified and trusted security concept of nPA in the form of the eID function, guaranteeing the identification of users within a system that manages user roles and their respective access rights for a digital product memory. If a user is recognized as a patient and owner of a blister by the system, they can retrieve sensitive data about their medication and the corresponding dosage advice from the product memory of the blister. If a user is recognized as a doctor or pharmacist, they can access expert information supporting his professional patient advice, e.g. regarding possible medication interaction. The eID-function not only improves the security and adds comfort to the usability of e-business and e-government, but in connection with the SemProM technology also facilitates the development of intelligent everyday-life assist systems for everybody.

More information
www.semprom.org

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CeBIT HALL 9, STAND B40

Product Torchlight: Mobile Product Information Projection

The tremendous advances in the area of miniaturization of mobile projectors in recent years have made it possible to integrate the so called pico-projectors even into mobile telephones.

Product Torchlight, a DFKI application for mobile phones with an integrated projector, enables supplemental information to be projected onto a product. Customers at the super market who are unable to find the desired product can simply stand in the aisle, hold their mobile phone at a certain distance from the shelf, and the integrated projector will pinpoint the desired product by projecting an easily recognized marking directly onto the exact product the customer was looking for. The product recognition relies on the phone's integrated

camera. New product packaging will include an optical marker that can be read by the software.

Product Torchlight does more than just help to locate a certain product. It can also tag products that should not be purchased for example because of allergies or food intolerances. In addition, the application comes with a semantic zoom function, which adjusts the projected information depending on the distance. The closer one is to the product, the more information is projected. At some distance away from the shelf, Product Torchlight projects only a colored point marker; as the distance is decreased, pictograms can be seen and finally, text will be displayed.

At CeBIT 2010 DFKI will demonstrate how a mobile phone with an integrated projector can assist a shopper by accurately pinpointing the exact boxes of cereals that satisfy the taste preferences of the user.

More information
www.innovative-retail.de/en/projects

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CeBIT HALL 9, STAND B45

Dual Reality – From the Smart Home to the Smart City
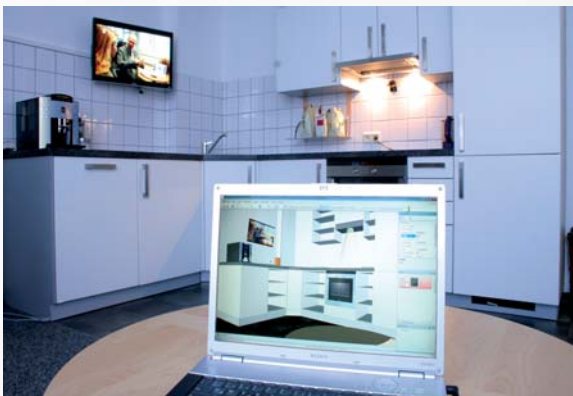
Dual reality models are virtual representations of the real world and at the same time networked with it. Not only do they reflect the appearance of the actual surroundings, but they can also function interactively within it. Such models aid in planning the positions to emplace sensors and actuators, e.g., RFID antennae, light switches or motion detectors, and permit simulation and evaluation prior to the actual installation.

A growing number of central control devices will shape the smart office and the smart home. In the more distant future, the development of smart retail and factory environments or even smart cities will benefit from the networking of real and digital worlds.

A Universal Remote Console (URC) has been developed in the EU Project i2home under the coordination of DFKI. This open, standards-based platform enables interactions with any number of devices and services over a central, customized control interface. The Yamamoto modeling tool enables the 3D representation of building interiors and the advance planning of layouts and instrumentation with sensors and actuators. In combination, these two approaches support an integrated development process for intelligent environments from concept design to realization.

At CeBIT 2010, DFKI will present a dual reality approach using the smart kitchen as an example. Originally developed for planning purposes, this 3D model of a kitchen may also be used as a supplemental user interface for visualization and interaction when construction is completed.
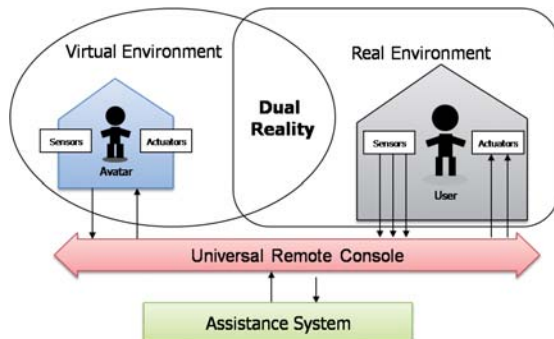
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DiLiA – Digital Library Assistant

Digital libraries provide web-based access to scientific articles on various topics. Most of the time, the data is searchable only using text strings, such as names or standardized key words. If the user is researching for relevant references on an unfamiliar subject, the search is likely to be more laborious than successful.

In the DiLiA project, DFKI is developing methods to expand access to digital data libraries on several levels. DiLiA employs user dialogs to facilitate an interactive search, which efficiently limits the number of potentially interesting documents and indexes the content. The system enables the textual and visual search of results as well as the options of expanding or restricting the search in both modes so as to focus only on the documents relevant to the user. The text sources found are analyzed using deep information extraction methods to uncover cross links and contextual relationships.

DiLiA offers multi-dimensional access by using the relationships among data of different types. An index is provided of the relationships between the various dimensions, for example, definable search terms, key words, or personal metadata such as research institutes or authors which can be further browsed or searched by the user. Also, integrated within the user interface are information visualization tools like bar charts or interactive maps, which offer alternative views of the results and support the analyses.
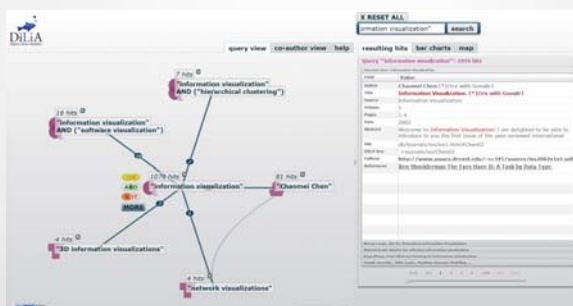
The DiLiA technology focus is concentrated in the areas of information extraction, visualization, and navigation methods. Besides hybrid information extraction based on a combination of metadata and document processing, domain-independent extraction methods for spe-

cialized terms and n-digit relations are being developed. The intelligent user interface on DiLiA provides intuitive multi-modal access, interactive personalized navigation, and adapted visualization techniques.
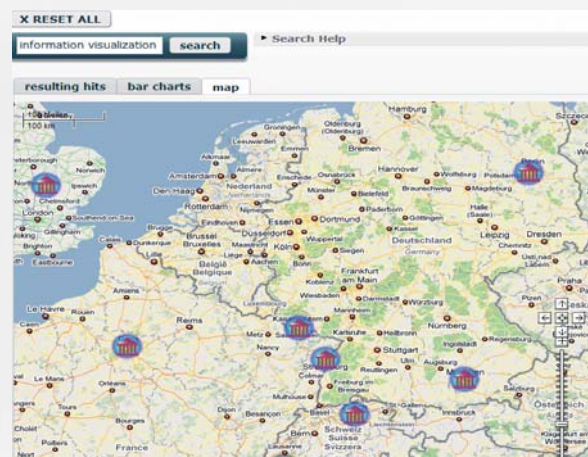
The current prototype integrates approximately 1.1 million data sets consisting of documents, the metadata, and the extracted specialized terms. The implementation design is based on client-server architecture with web-based access.

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BALLView – 3D Cinemas as Interactive Biolabs

With BALLView, 3D cinemas can become interactive pharmaceutical labs. Molecules and their physicochemical properties, as well as complex biological structures like viruses, can be easily calculated and visualized using BALLView. Researchers rely on an accurate and intuitive spatial perception of the molecular geometry and chemical composition for the development of new drugs, the study of biochemical processes, and in various applications in the life sciences, in order to get a precise idea of the spatial form and the chemical structures of the molecules.

So far, a realistic, stereoscopic depiction seemed to be irreconcilable with the comfortable interactivity of a processing application because of the highly complex image processing for both eyes. To this end, bioinformaticians from Saarland University and the University of Tübingen have developed the open-source molecular viewing and modeling tool BALLView. The stereoscopic three-dimensional visualization of molecules and their properties plays a central role in the process. In cooperation with the computer graphics specialists of DFKI and

the chair for Computer Graphics of Saarland University, the latest ray tracing procedures have been incorporated. Using this technique, complex molecules can be rendered and edited in 3D on a screen with realistic lighting effects, combining stereoscopic visualization with interactive real time ray tracing of molecular scenes, leading to improved depth of perception and unprecedented image quality. At CeBIT 2010 visitors can experience such an interactive virtual biolab on a 3D-screen at the booth of Saarland University to learn how drugs like e.g. Tamiflu work in the body.

More information
www.ballview.org

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Collaborative Visualization of Large Data Sets – ImageVis3D

ImageVis3D permits extensive 3D data volumes to be rapidly displayed and modified on small computers or even smart phones – recently, a free application has been made available for the iPhone.

The main application area of the ImageVis3D software so far has been in the field of medicine for the scientific analysis of 3D images, for example, from computer- or magnetic resonance tomography. Scientists and surgeons can use any standard computer to accurately study the human body and evaluate medical problems. It has also been used to modify high-resolution geographic imagery such as satellite photos from Google Earth. Until now the processing of such enormous data volumes was only possible on powerful computers.

Today, even the comparatively small iPhone computer can be used for visualizing images of the human body. The application is available as a free download in

Apple's App Store as ImageVis3D Mobile. The desktop version of ImageVis3D can be easily integrated with other software environments and its component design facilitates a flexible deployment. The software is under further development in the Science Computing and Imaging Institute (SCI) at the University of Utah and at the Interactive Visualization and Data Analysis (IVDA) research lab of DFKI and the excellence cluster Multimodal Computing and Interaction.

More information
http://ivda.cs.uni-saarland.de

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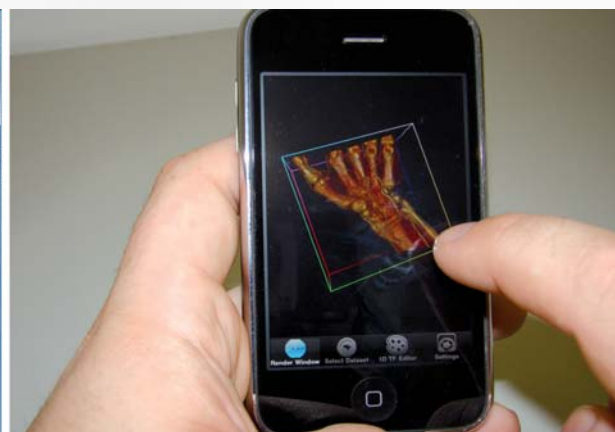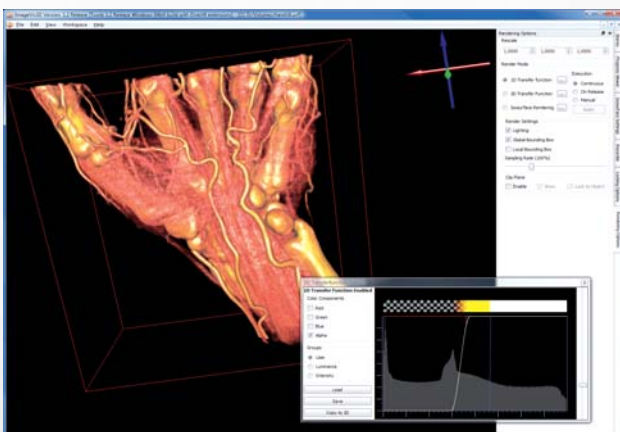
3D for the Internet: Interactive and Highly Realistic 3D Web Browsers
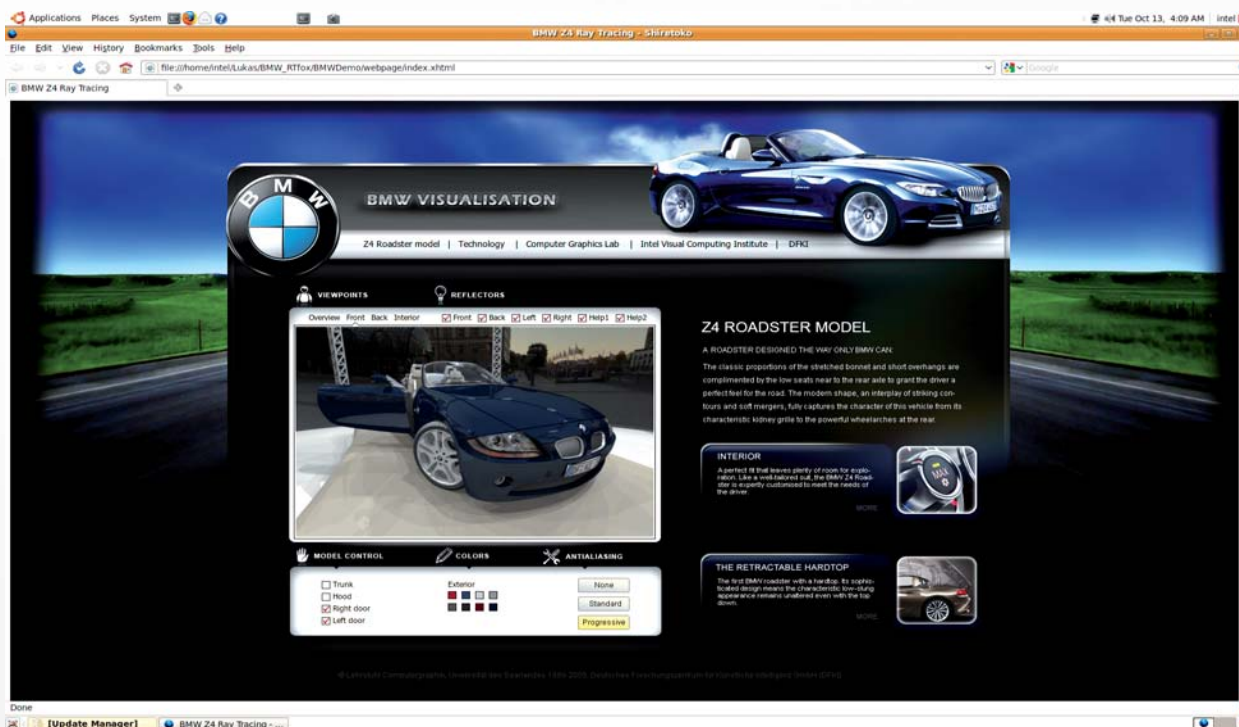
In the future, potential car buyers can take a tour in a virtual new car that has been specifically designed beforehand according to their taste. Gamers can move through three-dimensional online worlds, engineers will have completely new opportunities for jointly working on their products over the internet from different locations, using 3D models – collaborative engineering of 3D products in the industry will be significantly simplified by the use of the innovative scenario description language XML3D. New markets with a multitude of applications for 3D Internet will open up.

XML3D, a 3D internet technology developed at DFKI and the Intel Visual Computing Institute (VCI) at Saarland University, adds 3D capability to the classic HTML. This new web technology is helping to make interactive and highly realistic real-time graphics a standard technology for web browsers.

In contrast to earlier failed attempts such as VRML or X3D, the new XML3D enhances plain HTML with 3D capabilities. In this way, interactive 3D graphics can be embedded directly into any website, just like photos and videos are today – only much more interactive: links in a 2D text can change the 3D scene, show it in a different view, or start an animation. Conversely, clicking a 3D object link could lead to the display of a 2D text description.

A key advantage of XML3D is that it is completely based on existing web technologies, which minimizes the learning curve for web developers and designers. This makes it fast and easy to enhance existing web pages with interactive 3D graphics. Nearly all 3D objects are part of the Document Object Model (DOM) and can be manipulated by every developer via JavaScript. New 3D scene elements can be added as required using AJAX or the design can be modified via CSS.

XML3D has been developed for programmable graphics processors from the ground up. Even the material model, recently developed for XML3D with the portable "AnySL" shader description, relies fully on software-based graphics. In addition to the traditional rasterization method, for the first time, the use of AnySL shaders enables real time ray tracing to produce a still more realistic 3D scene display. After Prof. Philipp Slusallek and his team have made this interactive visualization technique ready for the market in recent years, the big chip producers Intel and Nvidia are advancing and marketing it for their specific hardware. In contrast to traditional methods, shadows and reflections can be visualized physically correct, which makes virtual scenes in movies and computer games appear much more realistic. These technologies enable all users to create high-quality 3D scenes and to publish them on the Internet.

Contact

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Urban Planning in Stereoscopic Virtual Environments

Interactive, spatial visualization of the new „City Riverwalk" in Saarbrücken

At the DFKI Agents and Simulated Reality department, new applications for Virtual Reality technologies are being tested and implemented. A virtual 3D model of Saarbrücken's planned "City Riverwalk" and a virtual reconstruction of the historic fortified city of Saarlouis with its "Vauban fortress" have already been successfully demonstrated. VR applications and visualization technologies can be useful in support of urban planning and serve to improve communications and public relations. Until now, the advantages of immersive, stereoscopic virtual environments have primarily been applied in industrial environments in the area of product development. Today, with the advancement of digitization technologies in design and planning as well as the better availability of detailed 3D models, we can observe an increased interest in the technology by urban planners and architects.

The virtual reconstruction of Saarlouis and its historic military defenses constructed in the 17th century by Sébastien de Vauban, military engineer of King Louis XIV, graphically conveys the history of this fortress town, showing its location, growth, and organization.

The challenge for the DFKI researchers in the "City Riverwalk" project was to integrate the diverse data models from surveyors, city-, landscape-, transportation- and bridge architects and to optimize the model for an interactive presentation in a VR environment. Processes had to be developed that permit the planners to continue the use of their traditional work methods while at the same time generating high-quality three-dimensional models.

The Virtual Reality installation at CeBIT 2010 allows the viewer to move about in the virtual city, quickly gaining an overview and taking in the sites as a pedestrian would in the actual city from various angles and, thanks to the stereoscopic presentation at a scale of 1:1, the viewer can fully appreciate the spatial impact of the model.

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CompanyM – Merging and Monitoring

CompanyM (M represents "Merging and Monitoring – Mix and Control") is a web-mining tool that uses ontology-based information extraction methods to access diversely structured and unstructured information sources about companies and automatically extracts information.
At regular intervals, CompanyM will access and extract information from a specific source and compare it to information already known from that source (monitoring). Any changes are automatically identified and made accessible, for example, to banks or rating agencies, or even regulatory institutions and business journalists.
The updated information is then semantically compared and merged with information from other sources (merging). The data source for CompanyM may be the imprint data published on company web pages, semi-structured annual reports, Wikipedia info boxes, as well as unstructured business publications. The results of the information extraction process are displayed in a shared XML format to provide the basis for mixing the information.
CompanyM has been developed under the framework of the European MUSING project (Multi-industry, semantic-based, next generation business intelligence) and is available as a web service.
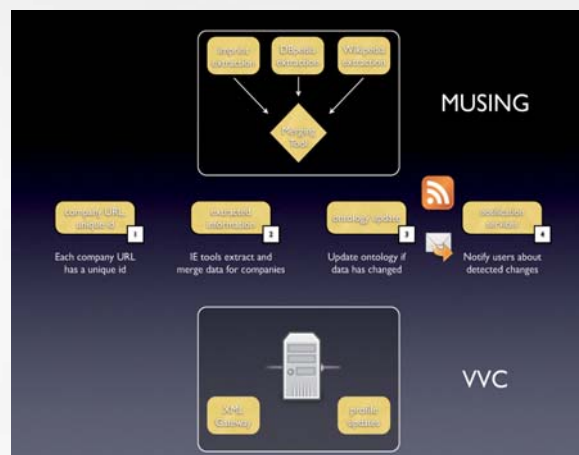
More information
www.musing.eu

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DFKI at CeBIT future talk

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

The "future talk" is the annual major communication forum of the future parc, located at the CeBIT Research Hall 9, stand A30. Lectures, live presentations, podium discussions and project demonstrations provide excellent insight into the technology standards of tomorrow.
In the course of the official opening, Prof. Dr. Wahlster, together with Prof. Dr. Lutz Heuser, Head of SAP Research, Peter Liebhart, CEO TZS, Prof. Dr. Wolf-Dieter Lukas, Director of Information and Communications at BMBF (Federal Ministry of Education and Research), and Prof. Dr. Dieter Rombach, Director of Fraunhofer IESE, will discuss urban management and the Internet of Things and Services in the context of civil safety.

TUESDAY MARCH 2, 2010

11:45–12:30
Keynote discussion
Urban Management – the Internet of Things and Services in the context of civil safety
Prof. Dr. Lutz Heuser, SAP AG
Peter Liebhart, TZS
Prof. Dr. Wolf-Dieter Lukas, Director BMBF
Prof. Dr. Dieter Rombach, Fraunhofer Gesellschaft
Prof. Dr. Wolfgang Wahlster, DFKI

Moderation
Reinhard Karger, DFKI

13:15–13:45
3D Internet: The world in a browser – interactive 3D graphics in Firefox with XML3D
Prof. Dr. Philipp Slusallek,
DFKI / Intel Visual Computing Institute

WEDNESDAY MARCH 3, 2010

12:15–13:00
Book presentation in future talk
"Heinz' Life – Short stories from the comings and goings of a computer" – Author's reading and press conference
Prof. Dr. Lutz Heuser, SAP AG
Prof. Dr. Wolfgang Wahlster, DFKI
other co-authors

THURSDAY MARCH 4, 2010

14:30–15:00
i-You – me too – Understanding everywhere: Mobile solutions for cross culture travelling
Dr. Feiyu Xu, DFKI & Yocoy GmbH

17:00–17:30
Social Semantic Desktop: The next generation – a personal digital memory for knowledge work, e-learning and social contact
Dr. Leo Sauermann, DFKI GmbH & gnowsis.com

SATURDAY MARCH 6, 2010

Future learning: Learning technologies for the classroom – Centre for e-Learning Technology (CeLTech) of the University of Saarland and DFKI

11:00–11:15
Learn maths with bridging courses – how smart computer systems can aid entry to an engineering program
Prof. Dr. Jörg Siekmann, CeLTech & DFKI

11:15–11:30
What am I to study? – Choosing the right courses with the help of intelligent assessments and e-learning
PD Dr. Christoph Igel, CeLTech

11:30–11:45
The 3D World of Medicine: How the internet is making the learning process more vivid for doctors
Dr. Gregor Hohenberg, CeLTech

11:45–12:00
Interview session: Study learning technology in the heart of Europe.
Advanced studies at the eCampus Saar and e-learning in the regional university
*Prof. Dr. Jörg Siekmann, PD Dr. Christoph Igel,
Dr. Gregor Hohenberg*, CeLTech & DFKI

Program coordination and moderation
Reinhard Karger, DFKI

CeBIT HALL 9, STAND A30

DFKI – Core Partner in EIT ICT Labs, the New European Top Cluster for Information Technology

EU Commission President Manuel Barroso is looking forward to the European Institute of Innovation and Technology (EIT), with core partner DFKI, becoming a worldwide icon of European research and innovation policy.

The consortium "EIT ICT Labs" will do world-class research in the area of ICT (Information and Communication Technologies) and, as the premier innovation motor, apply its results to the fields with the greatest impact on society like energy efficiency, healthcare in an aging populace, safety in mobility, and climate protection.
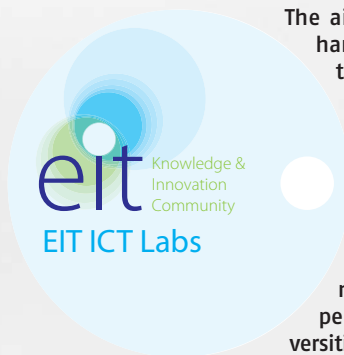
The aim of the concept is to harness the synergies between the topics Education, Research, and Innovation through grants and the systematic expansion of regionally anchored clusters and to strengthen an international network of the best performing institutes, universities, and industrial research centers. The decision criteria used in the selection of the best institutions were excellence, innovation potential, and forward-looking collaboration models. In December 2009, the finalists were announced in Budapest and the first three Knowledge and Innovation Communities (KICs) in Europe were launched. The KICs are highly integrated partnerships of universities, research institutes, and industry. EIT ICT Labs is the new European center of excellence for Information and Communication Technologies, in which five of DFKI's shareholders, SAP, Intel, Microsoft, Deutsche Telekom and Fraunhofer are involved.

As early as March 2007, DFKI Director Prof. Wahlster headed a working group for the EIT on behalf of the EU Commission to prepare a strategy paper on the role of Information and Communication Technology. This paper later became the basis of the solicitation which received a total of 18 competitive consortium bids. The very powerful industry EIT ICT Labs consortium ties up 75% of all European research and development budgets for information systems research, which is more than EUR 20 billion per annum.

Prof. Wahlster of DFKI represents Germany on the board of the new European excellence cluster. Prof. Henning Kagermann, President of acatech e.V., heads the supervisory board of EIT ICT Labs. As the former CEO of SAP AG, he has built up an excellent network in the top-management of the European IT industry.
In Saarbrücken, DFKI is a European core partner and the

The happy winners after the jury's decision in Budapest: l.–r. Dr. Udo Bub (Deutsche Telekom), Prof. Wolfgang Wahlster, Prof. Martti Mäntylä (HITT, Finland)

Max Planck Institute for Computer Science and the University of Saarland are partners in the national cluster, which is coordinated by Telekom Foundation, EICT. A risk capital fund of EUR 100 million has already been established to support the spin-off companies that are expected to emerge from the KICs during their respective startup phases.

The total annual budget for the KIC is initially set at approximately EUR 50 million which is anticipated to increase to about EUR 160 million by 2013, with just 25% to be financed directly by the EIT. DFKI as one of the 23 core partners is represented in two nodes of the EIT ICT Labs: in the European KIC-center in Berlin, represented by the DFKI Berlin project office, and in the national node in Saarbrücken. The German node mainly coordinates the topic Innovation, while Paris focuses on research and Stockholm on Education.

More information
www.eitictlabs.eu

Core Partners
www.eitictlabs.eu/web/page.aspx?refid=5

Associate Partners
www.eitictlabs.eu/web/page.aspx?refid=13

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DFKI – Winner of BMBF "Leading Edge Cluster" Competition

Europe's largest software cluster "Software Innovations for the Digital Enterprise" has been announced one of the winners of the Ministry of Education and Research (BMBF) cluster of excellence competition by Federal Minister Annette Schavan on January 26, 2010.

"The high-performance cluster signals an enormous boost to our three living labs and the rapid practical implementation of outstanding research and puts ICT as the number 1 motor of innovation in the place of the turbo charger for new economic growth," said Prof. Wahlster, head of DFKI. "The excellence cluster will especially strengthen the cooperation between science and the local software SMEs."

For DFKI-Saarland and the associated software companies, this decision by an independent jury means a strengthening of the work on the development of the smart factory of the future, leading to descriptive models of the manufacturing processes, new operational interfaces and retail innovations. DFKI is a member of the strategy board of the software cluster, together with Fraunhofer Institute for Experimental Software Engineering, IDS Scheer AG, IMC Information Multimedia Communication AG, Intelligent Views GmbH, proAlpha Software AG, SAP AG, Seeburger AG, Software AG, and Darmstadt University of Technology. Prof. Wahlster represents DFKI in the cluster strategy board. He also acts as the regional spokesman for the Saarland, alongside Prof. Rombach and Prof. Buchmann for the federal states of Rhineland-Palatinate, respectively Hesse. Joint spokesman for the cluster is Prof. Heuser (SAP). The Innovative Retail Laboratory (IRL), a DFKI "Living Lab" in collaboration with GLOBUS SB-Warenhaus Holding in St. Wendel, is directly involved in the R&D activities of the software cluster. The aim is all about offering companies the chance to transform themselves into fully integrated digital enterprises, instead of employing IT only as a tool for traditional business processes. Future economies and the vitality of a manufacturing and services society will depend on how well businesses succeed in establishing themselves as digital enterprises.

l.-r. Prof. Torsten Eymann, Thomas Feld, Karl-Heinz Streibich, Prof. Dieter Rombach, Prof. Christoph Wamser, Dr. Knut Manske, Prof. Johannes Buchmann, Prof. Wolfgang Wahlster, Gino Brunetti, Michael Kleeberg, Prof. Lutz Heuser, Norbert Eder, Carsten Kestermann

The Objective: Digital enterprises work in highly flexible, internet-based business networks and align their business models and processes accordingly: all data about processes, production facilities, and resources in the actual business environment are available at all times with exact time and spatial resolution for planning, control, and optimization.

The Concept: In six projects, the software cluster is developing the concepts, technologies, and business processes for emergent software – a leap in innovation for enterprise software, which is one of the most important sectors of the German economy. Emergent software dynamically and flexibly combines a multitude of elements from various suppliers to satisfy the highly complex demands of digital enterprises. This software dynamically adapts to the requirements of the marketplace and the business environment, supports complex and dynamic business networks, and contributes to the innovative online services of the future.

The Region: The software cluster radiates from the cities of Darmstadt, Kaiserslautern, Karlsruhe, Saarbrücken and Walldorf.

More information
www.ideen-zuenden.de/en/468.php

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Smart Video Buddy – The Intelligent Video Assistant

Smart Video Buddy analyzes running video programs in real time, automatically understands the content of films and identifies sports like soccer or basketball in a conceptual way. The system associates the analyzed video with other content and suggests clips or broadcasts with a related theme, opens an adaptive news feed, or recommends products related to the running video. The intelligent assistant extends and links video streams making them "smarter".

Video libraries – whether TV archives or private video collections – are growing rapidly throughout the world. There has been a rapid progress – not least thanks to the success of web video portals like YouTube – in everything from passive TV consumption to individual video feeds and more interactive users.

While efficient indexing and search strategies exist for other media, the management of video content still presents additional challenges: because of the lack of key wording or tagging, information is not easy to find and the linking of content is more difficult. Researchers refer to this condition as the semantic gap between the bits and bytes of the video streams on one side and the semantic interpretations of the user on the other side.

At DFKI, the Multimedia Analysis and Data Mining Lab is working on technological approaches to automated understanding of video content. The automatic recognition of objects, locations, and activities, e.g., "Eiffel tower", "beach", or "soccer" is possible using statistical analysis of videos. The descriptive features of a scene like color, texture, and motion are extracted and assessed using statistical learning methods. The system is able to use this information to determine the probability of occurrence for the different semantic content.

Application Scenarios

This approach presents a series of interesting fields of application:

Search: One of the core applications is to search video data bases. The input of a key word, for example, "soccer", lets the system find the corresponding scenes – entirely without any previous manual indexing.

Networking and advertising: An automated understanding of the concepts in a running video scene supports deductions regarding the user's interests. This enables intelligent technologies to develop "on the fly", i.e., while watching, the recommendations for other videos, web content, or commercials.

Content filtering: Another application is the detection and filtering of offensive or even illegal content, e.g. violent or pornographic scenes.

More information
http://madm.dfki.de
http://madm.dfki.de/smartvideobuddy

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CeBIT HALL 9, STAND B45

Smart Video Buddy automatically identifies a running program as "soccer" and suggests – based on this information – suitable news and related products to the user

Text 2.0 – When Text Knows It Is Being Read
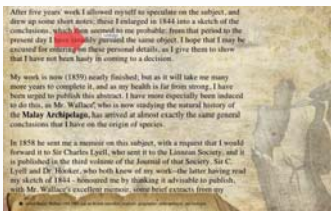
Imagine reading a text, and the passage you're reading triggers the matching sound effects, background music, accompanying pictures and additional information. Silent text is being transformed into a multifaceted composition, and the progression is solely determined by the view and the concentration of the viewer. The reader isn't a passive consumer anymore, but actively controls the events.

Text 2.0 can do even more than that: it supports the reader, changes, adapts to the circumstances, helps whenever it is needed and reduces information in cases where their display is not necessary. Text 2.0 is a prototype and vision of how the perception of texts and documents on digital media will change.

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. The viewing position of the reader on the screen is being determined by the integrated eye-tracker.

At CeBIT 2010, DFKI will be demonstrating Text 2.0 by the example of an excerpt of Charles Darwin's "On the Origin of Species", enriched with typical augmented reading elements like spontaneous translations, intelligent footnotes, automatic bookmarks and natural-language communication. Supplemented with multimedia feedback, selected chapters from "Dracula" or "The Little Prince" also become augmented text.

More information
http://text20.net

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Social Media Miner – Web 2.0 Trend Recognition for Companies

Opinion-forming processes are no longer solely a phenomenon of traditional media like newspapers, radio, and television. Today, the World Wide Web also plays an important role. The advent of web 2.0 generated even greater numbers of users who contribute online content. They express their opinions in blog articles and write product evaluations in e-commerce platforms and exchange thoughts in discussion boards.

In the context of their innovation processes and customer communications, commercial companies recognize that they need to maintain a constant awareness of what is being said in online domain discussions (e.g., about a product or a person). However, because of the volume of information available in web 2.0, it is very time and cost intensive to read all the relevant entries. Social Media Miner (SMM) provides partially automated support for the company's market researchers so they do not lose sight of what is happening in the domain: they can gain an overview of the discussion topics and recognize emerging trends at their earliest stage.

SMM does this by pooling blog articles for specified domains from various search engines. Through a combination of algorithms taken from Social Network Analysis (SNA) and text mining, the categories can be defined within the domain and the most influential blogs per topic are prompted for recommended reading. Social
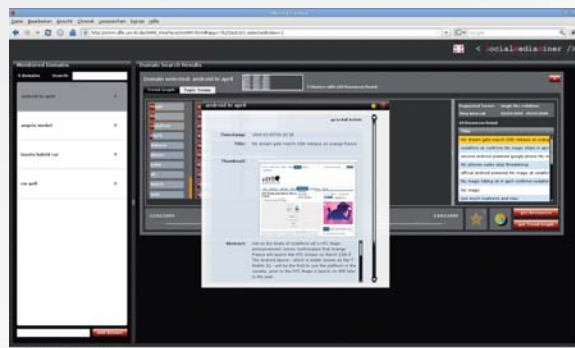
Media Miner is funded by the Investitionsbank Berlin (IBB) within the framework of the EU ProFIT program, and the industry partner is trommsdorff + drüner innovation + marketing consultants GmbH.

More information
http://socialmediaminer.wordpress.com

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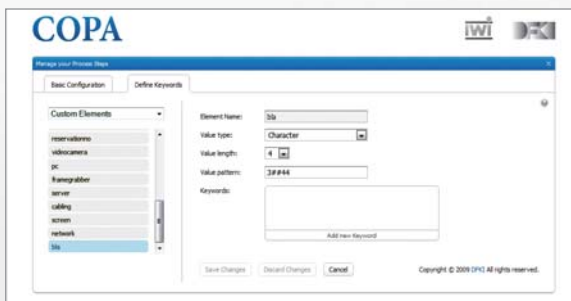
The aim of the European project Commius (Community-Based Interoperability for SMEs) is to make collaborative business processes as user friendly as possible. Therefore, they have been divided into three corresponding interoperability levels: system, semantic, and process interoperability.

The Commius system will link existing E-mail structures (system interoperability) and, depending on their con-

tent (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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CeBIT Visitors Recommend... myBoothfinder

myBoothfinder helps trade show visitors find a particular booth at the CeBIT 2010 future parc and simultaneously gives them an opportunity to evaluate the exhibitor's trade show presence. The user can also access and use the comments and recommendations of other visitors for example in order to find their favored exhibits.

myBoothfinder facilitates the search for a specific booth at the future parc or, based on individual interests, it will recommend the appropriate booths. For this purpose, user preferences are stored in a personal profile that is used to generate custom recommendations. myBoothfinder also lists other users with similar interests, so the visitor is able to focus on their experiences, and by these means, pursuing the social-community-concept, a "follow me" function is offered. Any visitor that has an internet-capable cell phone (mobile) can use the interactive mobile web service. There is

no need to install additional software – just visit the URL http://myboothfinder.dfki.de.

myBoothfinder is a customized and context-aware search and recommendation engine and illustrates the technologies being developed in the uService and m:Ciudad projects. The BMBF uService project focuses on application in the sports, fitness, and health sectors while the m:Ciudad project studies mobile search and recommendation services for the tourism and leisure branches. Unlike the national uService, m:Ciudad is funded under the 7th Framework Program of Research of the European Union.

More information
http://myboothfinder.dfki.de

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BauVOGrid – A Grid-Based Platform for Virtual Organizations in the Construction Industry

Success-oriented planning and construction requires a powerful network of member companies. Teamwork can be substantially supported through the efficient use of appropriate information technologies and the creation of Virtual Organizations (VO). Innovative real-estate developers expect their contractors and sub-contractors to employ such construction-specific, cross-company information systems both in the planning as well as in the actual building and use phases in order to assure professional decision making.

The BauVOGrid project develops an expandable construction community solution. The goal is to use virtual organizations to improve structuring, functioning, and operations in the construction sector via a flexible and reusable infrastructure. This is being achieved by a hybrid grid- and web-service-based platform that enables a controlled representation of role-based responsibility/authorization structures. It provides fast configuration and management of both global VO processes and local company-specific processes according to the VO responsibility structure. Information from different sources is integrated and supplied in a fast, flexible and secure manner to the headquarters and also remotely, at the construction site.

In addition, the mobile on-site capture of processes and process/product data improves the basis for faster and more efficient decision making while keeping the local staff involved. The focus is on fault (errors and omissions) management, which plays a key role in the building cycle – from construction to facility management. In addition to the VO management portal, platform development employs process-focus to link a mobile device equipped with an integrated RFID-based locator and pattern recognition to a central fault and media management system. Data exchange is based on harmonized XML schemas. In 2009, the first operational tests for facility management were successfully demonstrated at the new Rudolf Harbig Stadium in Dresden. The planning is underway for the first operational implementation.

The Institute for Information Systems at DFKI is joined in the BauVOGrid consortium by the following members: Institut für Bauinformatik at the Dresden University of Technology (project coordinator), Fraunhofer FIRST (Institut für Rechnerarchitektur und Softwaretechnik), IDS Scheer, SEIB ITC, TransMIT Gesellschaft für Technologietransfer mbH, RIB Information Technologies in addition to the large, commercial construction firms of Bilfinger Berger and BAM Deutschland.

The mobile application system in its current stage of development can be seen at CeBIT 2010 along with the component methods of process-based integration of different fault management services – from the concept stage to the instantiation of a workflow management system.

More information
www.bauvogrid.de

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▶ PROWIT – Web 2.0 in Business Processes

Internet-based communication- and cooperation services, especially Web 2.0-applications, offer broad potential for the optimization of business processes. The PROWIT project (Process-oriented Web 2.0-based Integrated Telecommunication service) intends to test and evaluate these opportunities.
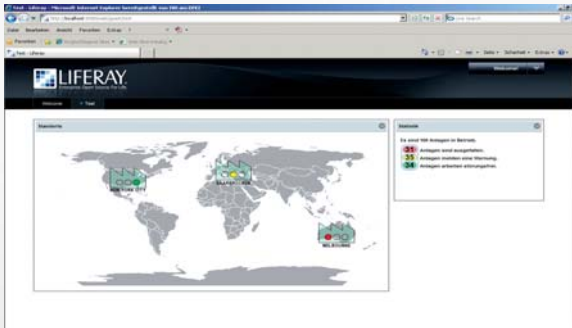
Based on a Process Collaboration Platform (PCP), communication- and cooperation services shall be brought together in order to allow the process participants to communicate in a timely, result-oriented and context-based manner. The PCP facilitates access on documented process knowledge and a co-operant expansion of the knowledge basis relevant for the process community. The platform-integrated software and hardware sensors, e.g. in intelligent mobile terminal devices, make it possible to automatically retrieve contextual information from the process participants, supporting communication adjusted to the respective situation.

Application scenarios by means of which the PCP is being developed and tested in the PROWIT project originate from the areas of Supply Chain Management (SCM), Hybrid Value Added and IT Service Management. This ensures the flexible versatility in different contexts, additionally fostered by the choice and usage of external application scenarios.

At present, PROWIT peculiarly investigates an application scenario of Hybrid Added Value, in which products and their related customer services are combined. Machines delivered to a customer's manufacturing are being sold together with a service package that comprises the surveillance and the warranty of functionality of a machine by monitoring, early reactions on foreseeable outages and the short-dated

reaction on unforeseeable problems. In such cases additional dynamic and unforeseen emergency situations can occur that affect the timely and correct handling of the service process, like the drop out of communication networks, problems of accessibility, or faulty operations and reaction by the staff. PROWIT intends to make failure dynamics manageable using Web 2.0 technologies. For this reason, a prototype based on the open source system Liferay is being developed.

Additionally, centrally stored data used for cooperation with suppliers will be maintained in Wikis, social tagging and bookmarking functions ensure the retrieval of documents critical for the process, responsibilities can be inquired searching the documentations of the process community. Escalations of production problems can be performed context-based and timely using integrated communication technologies like VoIP, Instant Messaging, or mobile telephony.

The PROWIT project has started in January 2009 and will run for 3 years. It is funded by the Federal Ministry of Education and Research (BMBF) under the identification FKZ 01BS0833.

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

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*Niels Boye is a physician, specialist in internal medi-
cine, endocrinology, and health informatics. He is
working in the Central Management Unit of the
European Ambient Assisted Living (AAL) Joint
Programme.*

**DFKI: Mr. Boye, what's the objective of the AAL Joint
Programme?**

Niels Boye: The aim of the program is to develop and
implement innovative technology to allow the elderly to
stay socially connected and for compensation of disabil-
ities of a mental, cognitive or physical nature, thus
allow them to live independently in their homes. A sec-
ondary aim is to strengthen European research and
competitiveness in AAL-technology. The AAL Joint
Programme can be considered the first of its kind in this
area. It's co-funded by the 23 member states of the Joint
Programme and the European Commission. About 40%
of the amount of money comes from the EC and the
other 60% come from the member states – in call 2. In
practice this means that the single national agency
responsible for the national part of the program gets a
40% "bonus" on top of their own investment – and
international ranking and benchmarking in addition.

**DFKI: Palpably, what kind of technology could con-
tribute to live a self-determined life as long as possi-
ble?**

Niels Boye: The technology we use so far is not mature
enough. We're focusing on the control of vital functions,
which is good for medical care, but we don't have sen-
sors for someone who can't find their things at home or
forgets to shut off the stove or the water. Additionally,
most of the technology that is being built now won't fit
in an elderly person's home and therefore people won't
use it. This program aims at developing the technology
needed to change this.

**DFKI: How do you aim to find out how this technology
will be accepted by the elderly?**

Niels Boye: Usability research has a large stake in the AAL
Joint Programme. Field tests and a proof of concept are
mandatory. The program is demand-driven and user-
sensitive. The buzz word here is Participatory Design.
Actually we demand that the research consortia include
user organizations and end-users.

**DFKI: What are the main barriers for adapting existing
technologies for the AAL-scenarios?**

Niels Boye: There are a lot of technologies that appear to
be suitable for elderly people, but they are not blending
into the elderly's homes or their everyday life and they
are not easily usable. These technologies still need
ripening, maybe not in the technical sense, but in the
societal and social sense of technology. It has to become
much more user-friendly. Another major problem is that

*Dr. Jan Alexandersson, head of the Competence Center Ambient
Assisted Living at DFKI and MD Niels Boye*

the systems are still far too expensive to be incorporat-
ed into every elderly's home.

**DFKI: When will these advanced technologies be avail-
able for the target group?**

Niels Boye: There already are Smart Homes today, but we
still need to adjust Smart Home technology to the rest of
the environment of the elderly, and we need models on
top of it that make it possible to sense and interpret the
signals coming from the elderly. Parts of the technology
exist, they are not really fitting together, but soon they
will – in around ten years probably. We are hurrying,
because the age groups with a high birthrate are now
approaching our target age.

**DFKI: What are the particular prospects of the AAL Joint
Programme?**

Niels Boye: It would be an utopian dream to have com-
puters taking care of elder people who have never used
a computer before, so that's not what we are aiming at.
It will take a while before our technology is mature
enough for this particular social application, but there is
a very chance in the program: researchers can see that
they do innovation with a difference. They can really lay
the grounding for a good life of elderly people. You can't
do innovation for the sake of innovation in this pro-
gram.

More information
www.aal-europe.eu

CeBIT 2010 Premier for the Centre for e-Learning Technology

CeLTech
Centre for e-Learning Technology

Saarland University and DFKI collaborate on "Learning Technologies"

Effective on January 1, 2010 the Competence Center Virtual Saar University and the DFKI Competence Center for e-Learning will work even more closely together: CeLTech – Centre for e-Learning Technology is the new umbrella brand under which the activities of the University of Saarland and DFKI will be combined, i.e., applied basic research as well as application development and services in the area of learning technologies, teaching, learning, and testing software. Professor Dr. Jörg Siekmann and Dr. Christoph Igel, as co-directors of CeLTech, will have responsibility in the coming years for the buildup of the new center.

The aim is to establish an institution with an international profile that is without peer in Germany before the end of 2012, where basic research in the life long learning process is conducted and future technologies for

educational issues are developed; also, where development projects from day care facilities, schools, and universities to advanced training in a business environment can be followed and realized, as well as other projects in the context of non-profit organizations, commercial chambers, and associations. For CeLTech, the cooperation with IT-companies and educational institutions is as natural as networking with prestigious national and international work groups. The result is that more than a dozen independent labs will be established, each with a different special focus in the three divisions of CeLTech: "Research & Development", "Life-Long Learning", and "Consulting & Services".

More information
http://celtech.info

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Insiders Technologies – M@king Documents Work...

Insiders Technologies GmbH in Kaiserslautern specializes in innovative solutions and products for intelligent document processing and business process optimization. The core competence of Insiders Technologies is "content comprehension" – recognizing and understanding the content of the entire multichannel range of inbound documents. Close cooperation with leading research facilities like DFKI and the Fraunhofer institutes provides a fertile environment for the growth of highly innovative products.

The cooperation of Insiders Technologies with DFKI has produced an intelligent e-mail management platform that recognizes the growing importance of e-mail as an accepted form of business correspondence and goes beyond mere responding and filing. The majority of companies today use e-mail as the preferred means of

communication both in B2C as well as B2B environments. This acceptance gives in- and outbound e-mails the qualities of a business letter. The efficient processing of incoming e-mails by intelligent technologies is the key to cost efficient and service oriented design of business processes.

The business performance of Insiders Technologies was honored once again in 2009: The software company was awarded the "Great Prize of the Small Firm Sector" by the Oskar-Patzelt-Foundation. The prize is awarded to small- and middle-sized companies deserving special recognition for business achievement and especially those firms that demonstrate excellence in the interests of sustainability.

More information
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GNOWSIS.com – Helping People Remember

GNOWSIS
HELPING PEOPLE REMEMBER

DFKI spin-off company Gnowsis.com develops and provides innovative solutions for personal information management. The interchange, structuring, and organization of information are cumbersome work, considering that data is stored in various applications which have no direct connections. Information may be available at our fingertips, but we often don't know where to look. This results in unproductive time being spent on searching for information rather than doing productive work.

Based on web 2.0-technologies, the semantic desktop provided by GNOWSIS.com is a personal information model designed to deliver ready-to-use data in a simple and efficient manner. The system communicates with, and links information stored in various office applications. The existing data is processed and "understood" by the system using semantic text analysis. Links between related data are generated automatically in addition to the suggestion of new relations and tags. The product, just as in human thought, is a network of projects, appointments, documents, websites, contacts, and to-dos.

GNOWSIS.com is a partner in a strong knowledge network: the software is being developed further together with DFKI and commercially implements the results of the NEPOMUK European Integrated Project. At the European Semantic Technology Conference 2009, the company won the 3rd prize of the international Innovation Seed Camp and is supported by the INiTS.at incubator in Vienna, Austria.

More information
www.gnowsis.com

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i-You – Me Too: Fun and Success in China With an iPhone

Communication in China is quite a challenge for tourists, business travelers, and long-term guests, because very few Chinese speak English, let alone German. Conventional dictionaries and guidebooks require time and patience to flip through the pages and they cannot talk. The electronic successors, smart phones and PDAs, may be handier, but can only read pre-programmed words and phrases.

Yocoy Technologies, a spin-off company of DFKI based in Berlin, is introducing a mobile software which allows for much more freedom of expression, even whole conversations can be conducted. The iPhone App i-You gives travelers the ability to freely enter a sentence or to create one using preloaded components, in German or English, and let them translate and read aloud flawlessly. The Chinese partner in the conversation then selects the appropriate answer from a list of prompts displayed in his language. If the user is attempting to say something that is hard for him to say even in his own language or is having difficulty in explaining something, pictures can be added to the conversation. Travelers who use i-You can pose questions, make comments, formulate complaints, give compliments, flirt, bargain, or just make small talk. The current version of i-You is a client-side application and is independent from mobile networks or an internet connection. A web-based version is in development.

A software prototype has been successfully tested under various field conditions, including the Olympic Games in Beijing. A German-Chinese team develops the product for multiple mobile platforms, and i-You will be available as an iPhone App before the opening of the World EXPO in Shanghai. The team at Yocoy is currently working on combining the language ability with comprehensive information about the country, culture, and places of interest, in this way offering real intercultural communications. Additional foreign language versions are in development, too.

More information
www.yocoy.com

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DFKI Interview: Dr. Dirk Werth

Dr. Dirk Werth is head of the Business Integration Technologies Group at the Institute for Information Systems at DFKI.

What is your work incentive at DFKI?
I brought my project with me when I came to DFKI in 2003. That gave me a certain independence right from the start and I could develop own ideas – something which is very important to me. You can add to this the innovative atmosphere that exists at DFKI as well as our clear focus on application oriented prototype research.

Have the research topics changed since your arrival at DFKI?
In the beginning, research was dominated by the large organizational topics (for example, BPM and ERP). Today's focus is on the staff and employees as the critical success factor. This thematic shift is clearly visible in our projects.

Did the business crisis of 2009 have an effect on your work?
Yes and no... Our cooperation with commercial companies is much closer now. Some of them were hit rather hard by the crisis, which also affected our cooperative projects. Nevertheless, 2009 was a very good year. We were able to achieve our goals and experienced double digit expansion. This result, of course, is only possible with an outstanding team and I want to express my appreciation to them here.

How do the ideas for a new project come to you?
I have the best ideas when jogging. After a few kilometers, the head is free and I am able to really reflect on things. Decision making is easy and new ideas abound. Sadly, I usually forget much of it before I have the chance to write it down. Now I really look forward to the "Lifelog" being developed at DFKI.

What are the most important future challenges?
Our collaboration with the business community was greatly intensified over the past year. More than 40% of our resources originated directly from these relationships. I think this is the proper path to take. Application oriented research must always strive to find a timely introduction into the market. For example in 2009, we developed "SmartTruck" together with DHL and introduced intelligent delivery vehicles into actual operations on the streets of Berlin. That is my idea of real innovation!

Introducing: The Association of Friends and Supporters of DFKI

The Association of Friends and Supporters of DFKI e.V.

The Association of Friends and Supporters of the German Research Center for Artificial Intelligence (VFFDFKI e.V.) was founded as a non-profit organization in 1998. The aim of the organization is to support research and development in the field of Artificial Intelligence and, in particular, to strengthen and promote the growth and the research activities of DFKI.
The current focus of the group's activities is on the creation of a social network, especially to offer former employees the chance to keep up their contacts to DFKI and other alumni.
In its 20 year history, DFKI has produced more than 800 alumni. The research center was an important stepping-stone to a successful professional career for many of them. The association offers alumni a selection of continuing education possibilities and a network of valuable contacts in addition to the opportunity to track the various career patterns of other alumni, which are impressive proof of the success of DFKI and illustrate why the institute is so attractive to its current and future staff.

The annual meeting in 2009 was planned to coincide with the opening ceremony activities for DFKI Bremen and the inauguration of the Bremen Ambient Assisted Living Lab (BAALL). In September, the organization sponsored the first alumni meeting at DFKI Kaiserslautern. The agenda focused on interesting lectures by the alumni presenting their current projects and on a workshop on the topic "From the Internet of Things to the Internet of Services to Intelligent Business Processes". A special highlight of the event was the visit to the SmartFactory^{KL}, where the technologies for the factory of the future are being developed.
The association's annual meeting in 2010 will be held in conjunction with the opening of the new visualization center at DFKI Saarbrücken.

More information about the activities of VFFDFKI e.V.
www.dfki.de/vffdfki

Visit at SmartFactory^{KL}

News in Brief

Prof. Dengel Named Honorary Professor of Osaka Prefecture University

Taketoshi Okuno, President of the respected Japanese university, acting on a resolution of the faculty of Computer Science and Intelligent Systems, has appointed Prof. Andreas Dengel, site spokesman for DFKI Kaiserslautern and member of the management board as an honorary professor of Osaka Prefecture University. He has been honored in recognition of his many years of service and contribution to the joint development of education and research, scientific and academic exchanges, and support to the enduring partnership between Osaka Prefecture University (OPU), the University of Kaiserslautern, and DFKI.

SmartFactory[KL] Successful in T-Mobile "SME Innovation Prize" Competition

The technology initiative SmartFactory[KL] has been honored in the competition for the German "SME Innovation Prize 2009 – Integrated Solutions" by T-Mobile. This prize highlights forward looking solutions in the field of integrated communications and the optimization of

Prof. Detlef Zühlke, Dr. Rüdiger Dabelow, Ines Heck

business processes. The SmartFactory[KL] projects to improve service and maintenance processes convinced the jury of experts from T-Mobile. SmartFactory[KL] – the intelligent factory of the future – unites companies and research facilities dedicated to the development, application, and deployment of innovative manufacturing technologies. In these community projects, visionary products and methods are developed and tested at a demonstration facility in Kaiserslautern-Siegelbach. Chairman of the technology initiative is Prof. Detlef Zühlke, head of Innovative Factory Systems at DFKI.

DFKI Launches Competence Center for Ambient Assisted Living (CCAAL)

The aim of the new competence center is the establishment of a department-, project- or site-overarching structure that documents AAL activities of DFKI, increases transparency, identifies synergies, and promotes DFKI in the area of AAL. In the process, the international research agenda will be taken into account and the appropriate topics and solutions shall be integrated into the DFKI research roadmap. The competence center serves as an independent partner in all matters pertaining to AAL, across different technological approaches. Dr. Jan Alexandersson, Senior Researcher in the department of Intelligent User Interfaces has been appointed to head the new center.

Outstanding Student Paper Award for Sebastian Germesin

Sebastian Germesin of the DFKI Research Department Intelligent User Interfaces and Theresa Wilson of the University of Edinburgh, School of Informatics, obtained

the Outstanding Student Paper Award at the International Conference on Multimodal Interfaces (ICMI 2009) for their paper on "Agreement Detection in Multiparty Conversations". The two researchers are studying the automatic recognition of consent or denial in meetings with multiple participants.

Publications

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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.

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With a projected overall annual budget in 2009 of EUR 29 million, the previous year's record result was surpassed. Currently, DFKI has 372 employees and 311 student assistants. The circle of DFKI industrial partners comprises among others Daimler AG, Deutsche Telekom AG, SAP AG, IDS Scheer AG, Empolis GmbH, Microsoft Deutschland GmbH, Deutsche Post AG, BMW AG, Deutsche Messe AG, EADS Astrium GmbH and Ricoh Ltd. By acquisition of company stakes, Bremen University, Harting KGaA and Intel Corporation joined the circle in 2009.

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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 110 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. January 2010 marked the most recent review of DFKI in the 5-year evaluation circle by the Federal Ministry of Education and Research (BMBF). 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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