NEWSLETTER

GERMAN RESEARCH CENTER FOR ARTIFICIAL INTELLIGENCE

1/2007

Research Labs

DFKI at CeBIT 2007

Two new DFKI shareholders from the DAX 30

Germany
Land of Ideas

Selected Place 2007

Selected Place in the Land of Ideas

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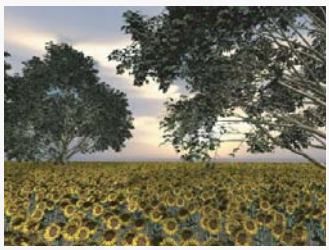
Competence Center of Computer Science is a „Selected Place“ at CeBIT 2007

DFKI, as part of the Competence Center, will fulfill its role as a „Selected Place“ on March 19, 2007 at CeBIT 2007.

The Competence Center was established at the University of the Saarland in 2004 with a grant from the Saarland state government. The center consists of approximately 30 IT and IT related faculty chairs at the university as well as the non-university affiliated research institutes: DFKI, Max Planck Institute for Informatics, and the International Conference and Research Center for Computer Science, Schloss Dagstuhl.

The purpose of the Center, under the trademark „Informatik Saarland“ is to inform business, government, and the public about the research results with the aim of strengthening technology transfer. In presentations and exhibits in the future talk forum in Hall 9, booth A60 and at the exhibit booths of DFKI (B69) and the University of the Saarland (B65), the topics will range from computer graphics and language technologies to cryptography and networked multimedia. The Head of the Language Technology Division at DFKI, Prof. Dr. Hans Uszkoreit will be introducing the COMPASS2008 project, a digital tour guide to be deployed in the Chinese capital (p. 10).



How to get a driver's license in math will be explained with the aid of the eLearning environment, ActiveMath (p. 18) by Prof. Dr. Jörg Siekmann, Head of DFKI Deduction and Multi-agent Systems Division.

Additional information
www.informatik-saarland.de

„Open House“ at the Virtual Office of the Future at DFKI

DFKI-Kaiserslautern is the place to be on 24 April in the „Land of Ideas“. There you will find more than 60 research scientists working on innovative software solutions in the areas of knowledge management, intelligent image understanding, and pattern recognition, visualization and simulation. This is also the planned date of the official opening of the new DFKI office building in Kaiserslautern. The Rhineland-Palatinate State Minister of Education, Science, Youth, and Culture, Doris Ahnen will inaugurate the new building accompanied by the The Lord Mayor of Kaiserslautern, Bernhard J. Deubig, the President of TU Kaiserslautern, Helmut J. Schmidt, the DFKI management and other guests.

The trophy for the „Selected Place 2007“ will be presented in the new „showroom“ by a representative of the initiative „365 Selected Places in the Land of Ideas“ and a representative of Deutsche Bank.

Following the ceremony, guests can enjoy an overview of the technologies and research results of DFKI. An appreciation of the complete innovation cycle at DFKI – from leading edge research to practical applications – will be possible with a series of live-demonstrations. There will also be a lively and understandable presentation of the work of the AI researchers on implementing the „virtual office of the future“: Information and knowledge assistants helping humans to master knowledge-intense tasks. The work place of tomorrow is the semantic desktop, which links e-mails, files, photos, or appointments in a semantic network and independently derives knowledge and processes it beyond the boundaries of one specific application. At the work place of the future, innovative computer systems recognize the work habits and understand the goals of the user and provide relevant information in the current working context.

l.-r. Prof. D. Zühlke; D. Bertram, Deutsche Bank; Dr. W. Olthoff; Prof. A.Dengel; U. Schmidt, Deutsche Bank

Additional information
www.dfki.de/vof

4 of 365 „Selected Places“ in the Land of Ideas

Germany
Land of Ideas
Selected Place 2007

Four times, directly or indirectly, DFKI has been a select place in the land of ideas, and for one day of the year respectively, the ideas and results are presented to an interested public. From among over 1500 entrants, DFKI entered 4 winners with its participation in Saarland's Competence Center of Computer Science, the research carried out at DFKI-Kaiserslautern, the educational joint venture SaarLernNetz, and the SmartFactory. The nation-wide competition „365 Selected Places in the Land of Ideas“ is part of the project initiative „Germany – Land of Ideas“ under the patronage of the Federal President, Horst Köhler.

Additional information www.land-der-ideen.de

SmartFactory^{KL} a „Selected Place 2007“

The „Technology Initiative SmartFactory^{KL} e.V“ is the „Selected Place“ on May 21, 2007.

SmartFactory^{KL} – the intelligent factory of the future – unites companies and research institutes that have agreed to the joint development, use, and distribution of innovative industrial technologies as their common goal. Products and methods are studied and developed in common projects and then thoroughly tested in a demonstration facility. The declared goal of the initiative is the transfer of knowledge to the public domain according to Prof. Dr. Zühlke from the Center for Man-Machine Interaction ZMMI at DFKI. This should serve to sustain the innovative strength and international competitiveness of German industries in the area of machinery and plant construction.

The selection as a special place in the „Land of Ideas 2007“ gives the SmartFactory^{KL} an opportunity to introduce itself to a broad public and in a series of ongoing demonstrations present innovative manufacturing technologies like machine operations and locating per cell phone and wireless networks. The official presentation of the certificate is planned for 3:00 p.m. in the SmartFactory^{KL} in Kaiserslautern-Siegelbach. In addition to the Economics Minister of the State of Rhineland-Palatinate and The Lord Mayor of the Kaiserslautern, well-known representatives from industry will also be on hand to address the assembled guests. Furthermore, the event will provide an opportunity for exchange and interaction between companies, research institutes, and private persons, who have come to get a sneak preview of the factory of the future.

Additional information
www.smartfactory.de

Saarland's Center for Self-Directed Learning, one of „365 Selected Places in the Land of Ideas"

l.-r. M. Heipp; E. Rieder; Dr. S. Reichrath, State Secretary at the Ministry for Education, Culture and Science, Saarland; Dr. J. Burgard

This year on May 23, the regional educational cooperation „SaarLernNetz“ under the lead management of DFKI is the „Selected Place in the Land of Ideas“. The Federal initiative „Germany – Land of Ideas“ honors the innovative continuing education network of The Saarland and its three Centers for Self-Directed Learning located at Saarbrücken, Merzig, and Sankt Ingbert.

The major aim of SaarLernNetz is to bring the concept of lifelong learning closer to the broad public and to facilitate access to the associated infrastructure. The efficient transfer of knowledge and qualifications with the aid of self-learning software and eLearning programs provides for sustainable improvements in the quality of life for educationally challenged groups and persons with emigration backgrounds. The official presentation ceremony is planned for May 23 with representatives of the „Germany – Land of Ideas“ initiative at the Center for Self-Directed Learning in Saarbrücken. Representing all of the locations in Saarland on this date, the downtown Saarbrücken Center will present the entire range of continuing adult education programs.

Additional information www.saarlernnetz.de
www.selbstlernzentrum-saar.de

ArKoS – Cross-Company Cooperation Made Simple...

In October 2006, the „ArKoS – Architecture for Collaborative Scenarios" a project coordinated by the Institute for Information Systems (IWi) at DFKI, was completed after a successful 3-year term. The project benefited from the participation of 30 partners from research and business in the search for innovative solutions to promote collaborative business processes. Here, methods and tools were developed to facilitate cross-company cooperation.

The ArKoS solutions were developed in close cooperation with the construction industry as an initial application domain. Selected collaborative scenarios could be analyzed and tailored approaches, for example, to integrate schedule, budget, and volume planning in a construction project, could be developed. Just recently, the Federal Ministry of Education and Research (BMBF) added ArKoS to its list of successful projects.

The development of new modeling methods and tools for collaborative business process management (BPM) was a key focus of the project. IWi is presenting two of the prototypes at CeBIT: „CollMaP" (Collaborative Model Management Platform) and „CoMoMod" (Collaborative Mobile Modelling Tool). Both enable the organization-wide preparation of business process models. These can be provided to decentrally located business partners to serve as the basis for decision making in collaborative BPM.

When various tools and methods are employed, the management of collaborative business processes proves to be extremely difficult. A lack of know-how regarding the methods and missing IT interfaces increase the coordination costs of collaborative BPM. Decision makers still need a basis for their decision making in the form of collaborative models for the design, implementation, and control of collaborative processes.

The CoMoMod prototype represents the first time that aspects of collaboration have been integrated into business process modeling. The P2P tool allows real time interactions among modelers working at separate organizations on the same model and chat-supported model design. Models can then be stored as XML-based standardized BPMN formats. And, an integrated BPEL engine creates executable code for web services.

Collaborative models such as performance descriptions, organizational charts, or process documentation must be selectively provided to the cooperation partners. Existing tools are inadequate for this task, whereas CollMaP as a web-based model management platform is able to control this access. The platform is decentrally installed at the cooperation partners. It acts as an integration platform for the modeling tools. CollMaP administers on a project basis, the release and publication of collaborative models created by CoMoMod or other third party modelling tools.

Additional information
www.arkos.info

Services offered by DFKI
Project coordination, project management, process consulting, expert planning and implemention of collaborative GPM methods and tools

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TOSCANA – Toolkit for Business Service Management

TOSCANA is a prototype system that supports Service Oriented Architecture (SOA). The design of the toolkit is based on the five phases of Business Service Management.

During the analysis phase, support is provided for the review of business process models in the context of identifying possible business service candidates. This refers to economically practical job bundles that can be provided and executed as web services by software systems and are reusable when deployed with standardized import and export interfaces. Then comes the evaluation of the candidates, which besides the technical aspects, is concerned with the potential economic benefits. In the follow-on design phase, TOSCANA supports the detailed technical and expert design of the services. The implementation phase focuses on a comprehensive definition as well as composition of the services along the business process chain. In the final phase, TOSCANA accompanies the actual execution of the business service with control functions to deliver information about variances from the standard status and data for the continuous development of the business services.

Additional information
www.ccbi.de

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The Grant Assistant for the Saarland

The Saarland state government, in performing its role as a modern service provider provides a number of different types of grants. In the search for the appropriate program, interested parties have had several options available for obtaining the most useful information. However, until now there was no single, comprehensive, and systematic source for information about support services. The aim of this project is to facilitate reliable online research by citizens, companies, and administrators by assisting in the development of a subject matter oriented and technically advanced system concept. The grant assistant will be integrated into the existing service portal Bürgerdienste Saar, to provide targeted access to the diverse information and support services offered by the Saarland government. In addition to designing the grant assistant there is also a project proposal for the implementation of a prototype. This demonstrator will have the functionalities and the ergonomics of the grant assistant and enable research for selected services.

Additional information
http://iwi.dfki.de

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EXPLAIN Authoring Management Platform

The production of online-training media has never been easier. The EXPLAIN platform lets you prepare eLearning content without the technological know-how that used to be required. The web-based authoring management solution was proposed as part of a project funded by the Federal Ministry of Economics and Technology and is designed to support the production processes for learning content and the management of company specific content projects. EXPLAIN enables subject matter experts to effectively and efficiently create their own multimedial learning material or to organize existing raw data in addition to their full time jobs. The platform offers innovative value added services such as libraries, resource pools with offers from certified content providers, a didactic assistant as well as team services for project-related virtual communications. The platform follows the pattern of Web 2.0 design and seeks to integrate existing authoring tools and supports business use with its requirements based design.

Additional information
www.explain-project.de

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The Digital Product Memory

After a hard day at the office, stop by the supermarket to quickly pick up everything needed for that romantic candlelight dinner for two. Naturally, a good wine must go with the meal and nowadays, anything goes as long as you like it. But if you have ever tried a heavy Bordeaux with your seafood, you know, that some combinations are better left untried as very few would appreciate that taste.

This is when you could use some help from the digital sommelier, the DFG funded project called BAIR (Buyer Adaption in Instrumented Rooms) ongoing at the Saarland University and DFKI with the aim of providing customers with product information. An RFID chip on each wine bottle knows what wine growing region the bottle comes from and even the producer, what foods it goes well with, and at what temperature it should be served. A multi sensor approach enables ubiquitous access to all relevant product data stored in the digital product memory. The radio label on the bottle combines with movement, light, and temperature sensors to supply situational references for handling the noble beverage. The sensors record if the bottle of champagne or red wine has been shaken and recommend to the buyer that it be left to settle before opening or to decanter before serving.

After selecting the wine and the other ingredients, the meal must still be prepared for timely serving after your guest has arrived. Now is the time for the ambient-intelligence scenario „SharedLife“, which together with the reminders from the digital product memory, offers assistance to the home hobby cook: ingredients equipped with RFID chips and other resources are identified and localized, electronic kitchen appliances provide data to the PC, several cameras document the steps in preparing the various foods. These recordings can be reused as aids to help the user remember or may be passed on to others who want to prepare the same menu. The documentation from SharedLife assists the user with situational information in the preparation of a meal. Furthermore, the system can return to the product memory of the respective ingredients and, for example, provide a warning to prevent you from using old eggs in the wine sauce or inform you of damages incurred during transport.

The digital sommelier and SharedLife are two sample scenarios, which present the complete life cycle for food products from the standpoint of the end consumer: from individual assistance at the store and quality control during transport to final preparation in an intelligent kitchen. The vision of the digital product memory provides an insight of what life may be like in an intelligent environment, where common everyday objects are networked online to interact with and assist human beings.

Additional information:
http://ai.cs.uni-sb.de/bair
www.dfki.de/sharedlife

Services offered by DFKI
Design and evaluation of instrumented environments as well as methods to assist shoppers and to build digital memories

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VirtualConstructor – Interaction with Virtual Humans

Meet the virtual characters Jara and Taron! They live at the Volkswagen car construction lab and are acknowledged car specialists. With their expert guidance, visitors to CeBIT 2007 can build over 800,000 variants of a 3D car puzzle using just ten car parts on the scale 1:5.5 at five different positions on a workbench, whereby only 30 of these variants actually lead to valid car models.

„The complex combination of the latest RFID technology for automated situational awareness and real time animation of virtual humans with coordinated speech synthesis, together with situational dependent dialog planning for edutainment purposes regarding innovative technologies in car industry, represents a novelty in the field of Artificial Intelligence. This interactive installation creates a new dimension in intelligent edutainment" said Prof. Wolfgang Wahlster, Director of DFKI.

The virtual car specialists, Jara and Taron, appear in a life-size projection and comment on the actions being taken by the visitor while offering practical tips on the construction of variant models. Additionally, they can discuss the latest research results in car technologies, e.g., concerning driver assistance and safety systems. The interaction of the presentation agents with their human counterparts gives the visitors the impression of an actual conversation.

VirtualConstructor was developed as a tandem project of DFKI and the VW Autostadt of the Volkswagen Group. It is based on the results of the research conducted under the BMBF funded project, VirtualHuman. This innovative attraction has been a permanent exhibit at the VWAutostadt in Wolfsburg since April 2006.

Additional information
http://vc.dfki.de/
www.autostadt.de
www.virtual-human.org

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BERTI II – Natural Language Interaction with a Virtual Partner

Photo: Deutsches Museum

Visitors to the DFKI booth at CeBIT 2007 can learn about the latest sports results, match locations, and the current national league team standings by talking to Berti. Berti is a virtual character that responds in natural language when addressed.

The system is characterized by its ability to rapidly process a series of complex tasks in real time: animation of photo-realistic characters, intelligent dialog planning with camera angles integrated and dependent on the actual situation, and synchronised output of speech, gestures, and expressions. Berti can also respond appropriately and rapidly to the visitor interrupting him.

Virtual characters are a key technology for intuitive human-computer communication and may soon be as commonplace as mobile phones and TV sets. Innovation in this area of language technology and edutainment builds on the research results of DFKI and the BMBF funded project, VirtualHuman.

Berti can be seen as part of the permanent exhibit of award winning projects for the German Future Prize – the Federal President's Prize for Technology and Innovation at the Deutsches Museum in Munich. Prof. Wahlster received the prize in 2001 for his project „Language Processing Computers as Dialog and Translation Assistants". Berti is the result of a joint venture between Charamel GmbH (www.charamel.de), the VirtualHuman project partner, and Sympalog (www.sympalog.de), a spin-off from Verbmobil.

Additional information
www.virtual-human.org
www.dfki.de/zukunftspreis
www.deutsches-museum.de

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TALK to SAMMIE – Multimodal, Natural Language Interaction on the Move

Navigation systems, onboard computers, climate control units, electronic entertainment – the array of functions in today's automobiles provides comfort but also a confusing diversity of operating elements. The management of all these switches, levers and buttons over and above the actual driving skills can push some drivers to the limits of their cognitive capacity.

Photo: Oliver Lemon

A new multimodal dialog system called SAMMIE (SAarbrücken MultiModal Interaction Experiment) enables intuitive control of the entertainment electronics in the vehicle by means of natural interactive dialogs. SAMMIE responds to spoken language, manual inputs via the iDrive controls, or a combination of both and then sends the appropriate commands to the integrated multifunctional MP3 player. The system adjusts to the context of the dialog and the user behavior in several multimodal respects: it responds both in the spoken language and expands its answers in an information display. SAMMIE operates intuitively at all times; it does not have to learn special language commands and users need not thread their way through a multi-level menu. System behavior is context-sensitive, i.e., the user and the system initiatives alternate according to context; the system tasks adapt speech and graphics to the context and user behavior. The range of action extends from the call up of songs from the mp3 database to the administration of the playback lists. German and English are provided as the dialog languages to such an extent that even a multilingual import or export can be processed, for example, the call up of an English song title in a German language dialog. For security reasons, it is also possible to stop or pause an ongoing output from the system at the push of a button.

SAMMIE is the result of a close cooperation among the scientific partners and the industry partners and was able to transform the research results of the TALK (Tools for Ambient Linguistic Knowledge) project into a prototype of product functionalities. DFKI researchers, in cooperation with TALK project coordinator, Prof. Dr. Manfred Pinkal and his team from the computer linguistics department at the University of The Saarland as well as industry partners Bosch and BMW, have developed SAMMIE to the point of being the showcase scenario for the next generation of dialog systems. SAMMIE is the perfect demonstration of how an early representation of knowledge, originally built from a scientific perspective (here, the dialog modeling of the information state update approach (ISU)), can also excel in meeting what are clearly commercially-oriented requirements.

After multi-level iterations regarding design, planning, implementation, and integration, initial Wizard-of-Oz (WOZ) experiments for data collection were performed and a basis system was developed and evaluated. On the basis of these evaluation results, significant improvements were made to the existing system in the areas of design, functionality, robustness, and speed, which

in turn, lead to the present „Final Showcase" being integrated in a BMW test car using the existing hardware and software components. In the Fall 2006, the next phase of comparative field testing was conducted under real conditions with test persons in and around Karlsruhe in both standing and moving vehicle tests. The analysis of the results was extremely positive with a high rate of task completion.

Additional information
www.talk-project.org

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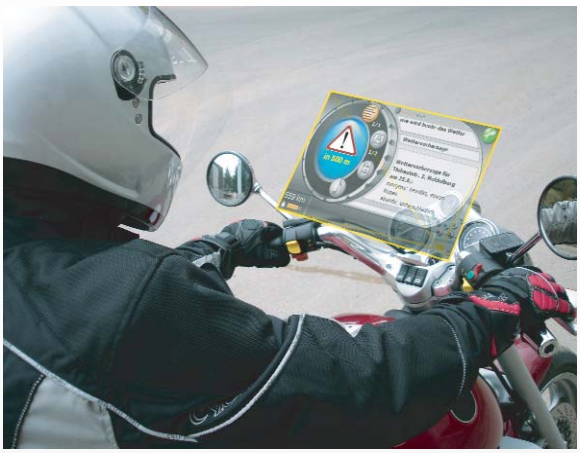
SmartWeb – Car2X-Communication and Intelligent Services for Vehicles



DFKI will present application scenarios of the SmartWeb project at the BMBF booth, B40 in Hall 9. Demonstrations will include intuitive, mobile, and multimodal access to the internet via speech dialogs and the Car2X communication system between a car and a motorcycle featuring for demo purposes, a danger warning.

At the core of the SmartWeb technology is a local multimodal dialog system for motorcycles in which a rules-based, adaptive system has been integrated for the local identification, evaluation, and presentation of the danger. The local dialog system includes a peer-to-peer end point that facilitates the exchange of the danger warning with other vehicles. The simulated ad-hoc communications between various vehicles, for example, a car and a motorcycle, enables the exchange of sensor data from the sender vehicle to the nearby at-risk receiving vehicle. The multimodal broadcast of the warning takes into account the current cognitive load on the driver and is displayed on the vehicle panel and, via Bluetooth, to the driver's helmet. The motorcycle system can link to the SmartWeb server at DFKI in Saarbrücken and process inquiries, for example, about the traffic situation.

Another scenario demonstrates the natural language control of web services in a vehicle. The driver can ask, for example, about the traffic situation, parking lot status, or „speed traps". Users will also be able to call up information about the weather, the events, hotels, or restaurants in the area and, as desired integrate the responses into the navigation system. SmartWeb provides the infrastructure for special application projects for the implementation of new types of value added services in the next generation of internet.

Additional information
www.smartweb-project.org

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dropping knowledge – Changing the World with Questions

Dropping knowledge has set ambitious goals for itself: The aim of this initiative is to kick-off an international dialog in which the most important questions of our time are addressed and possible solutions found. On September 9, 2006 at the „Table of Free Voices" on the Bebelplatz in Berlin, 112 „alternative thinkers" answered 100 questions of importance to mankind. Each respective answer lasted about 3 minutes and has been recorded, both as a video and as text, in a „living library" now available at www.droppingknowledge.org.

INNOVATIVE DISCUSSION PLATFORM FROM DFKI

In order to support the global dialog to the extent required and at the desired level, a new kind of internet platform for the „living library" was developed by DFKI with the aid of state-of-the-art technologies for knowledge and speech processing.

Each contribution in the dialog forum is linked through an ontology with background knowledge and related topics. The semantic web technology continuously reorganizes the content: contributions are automatically classified and assigned to the appropriate topics. Based on user evaluations and access statistics all relevant, widely discussed contributions are kept readily accessible. Additionally, speech technologies such as those that allow the recognition of proper names enable direct access to background knowledge.

The platform is both a search engine and a permanent library at the same time. Users can either perform a full text search or gain access via an intuitive, optical navigation to conduct their research. The system also responds with the appropriate search results to natural language text queries.

In 2007, the web site www.droppingknowledge.org was nominated for the well-known media „Lead Awards" prize in the category web design.

Additional information
www.droppingknowledge.org

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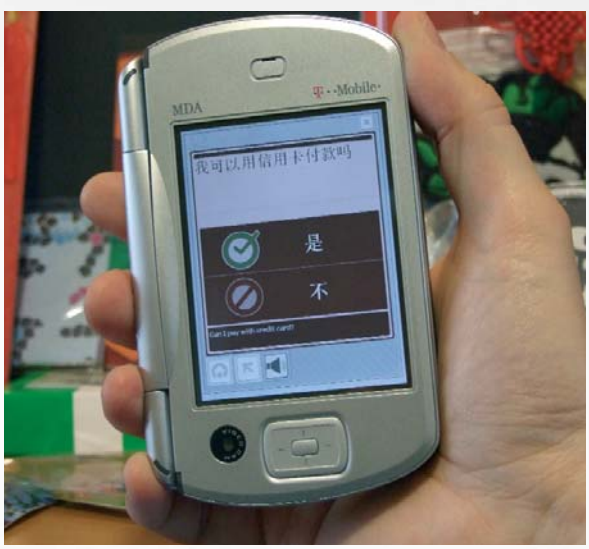
COMPASS2008 – Innovative, Multilingual, Mobile Information Services for the Olympic Games

COMPASS2008 is the digital travel guide for visitors to the Chinese capital and, having already been successfully tested, is being presented by DFKI once again at the Federal Ministry of Education and Research (BMBF) area in Hall 9, A40. The product is the result of a joint German-Chinese project of the same name and only requires a mobile device, such as a PDA or Smartphone, to establish a wireless connection in order to access the multiple information services available on the internet.

This multilingual mobile service assists visitors who do not speak the host language to master many common communication situations, for example, while shopping, at a restaurant, in a taxi, in an emergency, or simply seeking orientation in the Chinese capital. The program was evaluated by test users from several different countries in successful field trials conducted in Beijing during July 2006.

The scenario to be presented at CeBIT 2007 is the „Shopping Assistant", which assists tourists to hold a conversation with local shop owners even if they do not speak the language. The system translates customer wishes into Chinese and says the text aloud. The user



can ask for a certain product or inquire about available payment methods and even haggle over the price. The Chinese partner in the dialog, for example, can enter a selling price and respond with yes or no. The communication potential of COMPASS2008 is not limited to the translation of everyday language phrases; rather, it can intensify the intercultural exchange as demonstrated in the field trials. The test users had a lot of fun with the locals at the stores on their shopping tours.

DFKI-Saarbrücken is the German coordinator of the project. The multilingual mobile services and the multimodal user interfaces were developed at DFKI. Industry partners include: Deutsche Telekom Laboratories, which was very involved in developing and evaluating the field tests with an eye on future market potential and Fraunhofer Institute ISST in Dortmund, which contributed the service platform for the information services. On the Chinese side, the project is managed by the CAPINFO company which will deploy the COMPASS2008 technologies as a „Multilingual Service Supplier" at the Olympic Games 2008 in Beijing. Their research partner is the Chinese Academy of Natural Sciences.

The project is being funded by the Federal German Ministry of Education and Research (BMBF), the Chinese Ministry for Science and Technology as well as the participating companies. The use of the new technologies will not end with the Olympics. The software being developed is designed to be easily expandable for other languages and information content. This is why the industrial project partners see considerable opportunity to exploit the results of the COMPASS2008 project.

Additional information
www.compass2008.org

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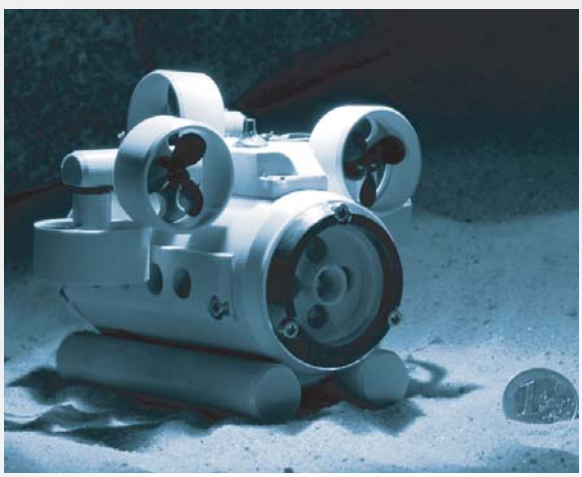
AI – The Outlook in Marine Technology

Exploration of the world's oceans and the ocean floor has barely scratched the surface. One explanation for this is the harsh conditions encountered by scientific instruments when deployed into the depths of the sea. The extreme pressures, the total darkness, the need to communicate via broad band (possible only over cable), and the high logistical costs all complicate the deep sea use of technical systems.

However, over the past few years the use of ROVs (Remotely Operated Vehicles) has become quite common for the purpose of deep sea research and exploration. Most ROVs still require a cable link to the surface ship and are usually controlled by multiple operators. Autonomous systems (AUVs – Autonomous Underwater Vehicles) are not so common and until now, such vehicles have seen only limited use in the area of surveying and measurement tasks.

Man's steadily increasing requirement for raw materials has fueled a greater interest in the exploitation of the ores, oil, and natural gas reserves located under the ocean floors. There is also great interest to learn more about the influence of the oceans on the biosphere as detailed information about the oceans promises to deliver critical data regarding future climate and weather conditions. The employment of the methods of artificial intelligence in the field of marine technology, espe-



cially in the development of autonomous or semi-autonomous systems, is crucial if we are to continue expanding our knowledge of the oceans and for the extraction of raw materials from the world's sea beds. Only with advances in autonomous underwater systems and the associated reduction in the burden on human operators will it be possible to someday work efficiently in the deepest ocean. The aim of the current research projects is to develop the technology to build and maintain entire production centers on the ocean floor with semi-autonomous robot systems.

DFKI Labs has developed the µAUV, a system for evaluating behavior-based controls for autonomous underwater vehicles under conditions that approximate those found at the ocean depths. The µAUV has four active degrees of freedom that allow freedom of movement in all directions. It can recognize underwater obstacles and signal sources through the use of light sensors and LEDs. The combination of light sources and sensors must be controlled just as the underwater acoustic sensors used

in undersea research today and, in this way, can be seen as equivalent from a behavior control perspective. The pressure hull of the µAUV has a length of 12 cm and a diameter of 5.5 cm making it the smallest, fully autonomous AUV in the world.

The µAUV is one of several activities at DFKI in the area of underwater robotics. The development of robust underwater image processing methods, the design of autonomous manipulators and alternative propulsion concepts, such as undulating and oscillating motors, are just a few of the other projects currently underway. As a research center, Bremen offers underwater robotics the optimal connection to industry and research communities in the area of marine technologies.

Additional information
www.dfki.de/robotics

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Intelligent Systems from DFKI for ICT 2020

The future parc at CeBIT 2007 is where the prototypes and ideas for life in the digital world of the future are introduced. In Hall 9, the Federal Ministry of Education and Research in accordance with the guidance for the new research „ICT 2020" will present innovative technologies, demonstrators, and protoypes with applications for the automotive logistics, health, and energy sectors.

DFKI is represented at the BMBF booths at A40, B35, and B40 with Car2X-communication, virtual interactive partners, intelligent services, and multimodal dialog systems for vehicles, digital product memories, an intelligent kitchen, and a multilingual digital City Guide.

At the DFKI booth B69, visitors can learn about the current DFKI projects and research work in the fields of business information systems, knowledge management, language technologies, image understanding, eLearning, multiagent technology, intelligent user interfaces, and robotics. DFKI-Bremen Lab will show how its proto-

type underwater robot can be employed in the ocean depths to control and repair data cables on the sea floor. The pressure hull of the µAUV has a length of 12 cm and an average diameter of 5.5 cm making it the smallest fully autonomous AUV in the world today.

The issues for the new high-tech strategy „ICT 2020" will be discussed at the future talk communication forum (A60, at the center of the research hall). DFKI is participating in speeches and podium discussions in interdisciplinary topics among researchers, scientists, interested guests, and corporate representatives. The forum will be opened on Thursday, March 15 at 11:00 a.m. by Dr. Annette Schavan, Federal Minister of Education and Research. In the opening panel discussion, „The federal government's new high-tech strategy: ICT 2020", Dr. Wolf-Dieter Lukas, Division Head at BMBF, joins Prof. Dr. Hans-Jörg Bullinger, President of the Fraunhofer Gesellschaft, Dr. Jorgo Chatzimarkakis, member of the EU Parliament, Dr. Said Zahedani, Microsoft Deutschland, and Prof. Wahlster.

On CeBIT Friday, March 16, Prof. Wolfgang Wahlster, Jury Chairman, together with EU Commissioner Viviane Reding, will present the European Commission's ICT Prize 2007. The official awards ceremony takes place in the Convention Center (Hall 3A, March 16, 11:00 a.m. – 12:00 p.m.). The € 200,000 Prize is considered the most important European honor in Information and Communication Technology. The three grand prize winners will be introduced at 2:30 p.m. in the future talk Forum of the research hall.

DFKI topics are well represented among the speeches and presentations in the future talk forum. Prof. Dr. Hans Uszkoreit, Head of the Language Technologies department at DFKI, introduces dropping knowledge, a knowledge-based social computing system (March, 16, 2:00-2:30 p.m.) and COMPASS2008, a digital tour guide for the Chinese capital (March 19, 12:00-12:30 p.m.). How to get a driver's license in math will be explained by Prof. Dr. Jörg Siekmann, Head of DFKI Deduction and Multiagent Systems Department, with the aid of the eLearning environment, ActiveMath (March 19, 1:30 -1:50 p.m.).

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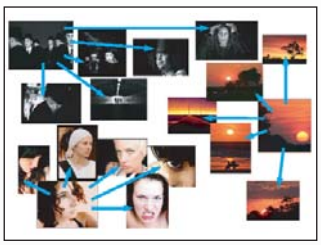
Query by Example – Content Based Intelligent Image Retrieval



Web 2.0 and the popularity of digital cameras have contributed to a rapid increase in the volume of images online, in photo databases, or in private digital albums. Traditional search engines can find image files only by the associated text such as captions, tags, or descriptive labels. The possibility of intelligent image retrieval based on visual content is the focus of development and testing by the Content-Based Image Retrieval department at DFKI. The search, for example, is for partial images or represented objects rather than for keywords or cues located at the periphery of the image.

Based on the open source Image Retrieval Systems FIRE, researchers at DFKI's Image Understanding and Pattern Recognition department have developed a method that enables the identification of similar images within a large database.

In the Query by Example method, a search pattern is first defined simply by clicking through a selection of random images before starting the query. A hand-drawn or a new image can also be used instead of an existing image. The method returns hits with the greatest similarity to the search pattern. Through relevance-feedback – the weighting of individual matches – the results can be further refined. Additionally, the user has the option of sending an image detail to query the system which then searches for images of individual objects.

The work on content-based image retrieval is part of the BMBF sponsored project, IPeT (Image-Based Personal Computing Technologies), where similar methods for video retrieval and general document processing are being developed.

Services offered by DFKI
Support and component development; consulting, design, evaluation and training in the areas of image retrieval, pattern similarity, and object recognition

Additional information
http://iupr.dfki.de

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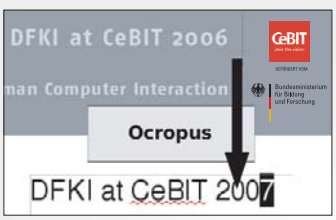
Ocropus – Open Source Layout Analysis and Text Recognition



Ocropus is an adaptive and adaptable Open Source OCR system (Optical Character Recognition), designed for use with desktop applications as well as for the input of large data bases. The system includes state-of-the-art methods of pattern recognition, statistical language modeling, and image processing.

Marketable OCR systems can reliably covert analog text sources into machine readable formats, but despite high recognition rates, few can deliver an error-free result. Additionally, the quality of the result depends to a large extent on the quality of the original materials: certain fonts, printer and paper quality, or simple state of the source can all lead to a high error rate that makes further control of the results necessary.

The objective of the Ocropus program is to make a significant contribution to the state of OCR research and associated technologies and to develop a high performance OCR system that is appropriate for general use with desktop applications, digital libraries, and archived documents.

Unlike existing systems, the Ocropus architecture is designed to be reusable and expanded by other research groups. Ocropus is licensed under the Apache 2 license so the first version is programmed for English texts and includes the DFKI layout analysis in combination with the open source OCR system, Tesseract. Contributions from the open source community, especially as modifications for additional languages are welcome.

Ocropus is being developed as part of the BMBF sponsored project, IPeT (Image-Based Personal Computing Technologies).

Services offered by DFKI
Support and component development; consulting, design, evaluation and training in the areas of document image processing, layout analysis, and text recognition.

Additional information
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NEPOMUK – The Social Semantic Desktop

The aim of the NEPOMUK Project – The Social Semantic Desktop is to develop a work environment for knowledge workers that enables and promotes personal information management and communication in social networks.

By deploying the technologies of the semantic web on the individual PC, an unlimited number of existing data sources and applications can be linked and annotated in a flexible and standard manner. The knowledge entered in this way, can then be – taking individual security interests and access permissions into account – communicated and exchanged with other work places.

NEPOMUK is funded under the European Information and Communication Technologies (IST) component of the 6th EU Framework Program. Under the management of DFKI, 15 partners throughout Europe are working on the realization of the Social Semantic Desktop and have integrated technologies such as natural language interfaces, peer-to-peer (P2P) networks, semantic searches, ontology, and other integrative technologies that permit the machine processing of content and exchanges across individual boundaries. Solutions undergo practical testing as case studies in the fields of biotechnology, consulting, industrial R&D, and in community Helpdesks.

In NEPOMUK, a framework with standard interfaces was developed that enables the simple integration of third party software. The core technologies of the project are being further processed under open source licensing. Active open source communities have already made contributions to the processing, employment, and improvement of the project results.

Services offered by DFKI
Technologies of the personal semantic web, methods and tools for collaborative ontology development, individual process-oriented knowledge management

Additional information
http://nepomuk.semanticdesktop.org

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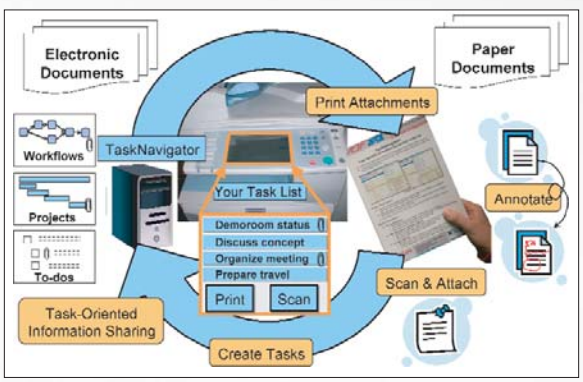
RICOH Demo-Room – Office of the Future

The RICOH Demo-Room is part of the Competence Center, „Virtual Office of the Future" (CC-VOF) at DFKI. In a cooperative project with RICOH, the VOF designs and tests innovative software solutions that effectively support knowledge-intensive work processes.



The RICOH Demo-Room lets visitors experience new methods of operation in the office of the future and, simultaneously, serves as an experimental test lab for new concepts in office procedures. The focus of research is on support to knowledge-intensive office work with a combination of intelligent assistance systems and multi-functional office equipment (Multifunctional Product – MFP) that combines the printer, copier, scanner, and fax in one device. A workflow-assistance system called TaskNavigator helps users to access personal task lists directly at the control panel of the MFP, or to print attached files, enter new tasks, or attach scanned documents directly to the corresponding task.

All actions at the MFP are executed in the context of the respective task being performed by the user: for example, the commonly used scan-to-email functionality is replaced by scan-to-task which not only reduces the load at the email inbox but also reduces the effort to organize documents required for the task-at-hand. The step from paper to intelligent task management is complete.

This task oriented document handling effectively integrates the MFP's as a resource for knowledge intensive processes and, in this way, represents an initial step towards the comprehensive use of such devices to manage knowledge-intense processes in the office of the future.

Services offered by DFKI
Demonstrations for visitors, creative integration concepts for MFPs; planning and implementation consulting

Additional information
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DynaQ – The Next Generation in Desktop Research

DYNAQ Desktop search engines are a practical and widely used tool for finding information stored on your own PC. Unfortunately, they have one of the same disadvantages as the internet search engines: i.e., the search strategy does not match the natural human search pattern. We tend to approach the search for information step by step, continuously narrowing down the search area corresponding to a strategy experts call „orienteering". In other words, we humans find it easier to find a path to our objective than to actually describe the objective in advance. Search engines, in contrast, demand a description of the desired information using key words.

DynaQ provides user friendly, interactive methods suited to the natural search patterns of humans such as the „range slider". You can navigate the search area with a tool similar to a „dimmer" that allows you to control the brightness of a light source – making the room lighter or darker. The user is able to modify the search area by seamlessly applying certain weights to certain search terms.

Furthermore, you can use the slider to sort documents already found according to their relevance to the context of the current search.

Unlike conventional search engines, DynaQ enters and indexes relevant meta-data for the documents, such as author or source and, in this way, facilitates the footnoting of the selected documents.

Services offered by DFKI
Usability studies, joint ventures, partnerships and consulting in the area of user friendly information research.

Additional information
http://dynaq.opendfki.de

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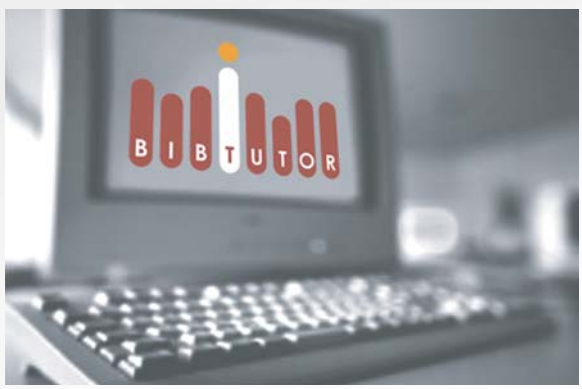
BibTutor – Virtual Librarian Assists with Information Research

Online library catalogs have multiplied the supply of expert literature available for research. However, at the same time, the diversity of search options often poses a difficult problem to the researcher. Inquiries are frequently answered with too many, too few, or sometimes even no response at all – or the search results simply do not meet user expectations.

The new research tool known as BibTutor, selects data pools, proposes search strategies and helpful support in the library search for information. This is possible in part by modern text mining methods that independently find alternatives on the basis of semantic similarities to the ad-hoc search terms entered.

„BibTutor helps the user to formulate the query, suggests relevant data pools, and limits the search area. The system supports advanced searches in the appropriate databases and provides important tips, recommendations and error notices or, proposes alternative search terms", said Prof. Andreas Dengel, Head of the Knowledge Management Department and spokesperson for DFKI-Kaiserslautern.

BibTutor adapts to the individual research situation and takes into account the differences in the chosen databases. The system helps users to help themselves by providing useful support and training. Ideally, the system becomes superfluous, as soon as the user has the know-how and has learned all the tricks of the trade to efficiently perform the research of expert literature.



The web based BibTutor system is available 24 hours a day and is scalable to the individual needs of various libraries.

A limited Beta version of BibTutor and more information is online at www.bibtutor.de

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CASCOM – Intelligent Service Agent for Medical Emergencies

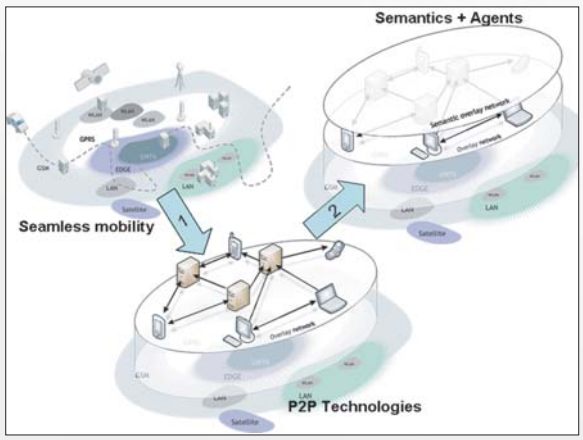
The aim of the CASCOM research and development project is the intelligent coordination of medical services at any time from any location by the innovative integration of technologies from the fields of multi-agent systems, semantic web services, peer-to-peer, and mobile telecommunications.

In the CASCOM project, application-specific services are encapsulated with intelligent software agents that are capable of efficiently solving highly complex tasks in dynamic environments. Application scenarios in electronic trading, tele-monitoring, and health services are examined and have been implemented as prototypes in emergency assistance scenarios. The possibility to safely communicate sensitive personal data – independent of an established stationary infrastructure – opens a whole new range of efficiencies.

This allows, for example, a tourist vacationing in a foreign country to access the data base of the family doctor or insurance agency using a PDA and the personal CASCOM agents in order to pass on information about prior existing illnesses to the local doctors. The medical team is provided with detailed information faster and with much more accuracy than the affected patient could ever report on his own. Expensive and repetitive diagnostic procedures that have already been performed at the patient's home can be avoided and many of the associated risks and costs can be minimized. The information transferred in this way is evaluated to determine whether the patient should be given immediate treatment or whether the decision should be made to transport the patient back to their attending doctor. The networked information sources guarantee that the costs incurred will be covered by the insurers. Emergency medical personnel who answer a call for assistance from a completely unfamiliar patient also benefit from the CASCOM architecture through having access to ad hoc communications and the ability to retrieve relevant data while on the move.

Software agents play an essential role in supporting the user during system operation by helping to locate the relevant services among the numerous sources and composing an appropriate response. Before such a dynamic composition can occur, a semantic description of the services must be available. Another prerequisite to employment is the integration of a trustworthy and reliable security function. Network and service providers must cooperate on a Europe-wide basis to insure mobile users have the access to the services. This is precisely why the CASCOM architecture prefers agent based coordination of services. The underlying processes are kept generic to permit separate uses of the system apart from the medical applications used in our examples.

Since the start, project specifications have defined the following three application scenarios: emergency medical assistance, tele-monitoring, and shopping malls.



The underlying design architecture for the mobile P2P network, the components and methods for the semantic service coordination have all been defined and developed. An integrated demonstrator of the entire CASCOM technology is available online at www.ist-cascom.org as a web demonstrator. The first field trials for the medical emergency scenario are scheduled for the spring of 2007. CASCOM will be presented at CeBIT 2007. Current planning calls for the entire technology to be available as open source in the summer of 2007.

The project is sponsored by the European Commission with funding in the amount of 2.69 million euros. The project term runs from September 2004 to August 2007 with a total of 8 participating partners based in Germany, Finnland, Portugal, Spain, Italy, and Switzerland.

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The Adaptive and Interactive eLearning Environment LeActiveMath

The ActiveMath platform of The Saarland University and DFKI serves as the basis for the development of the LeActiveMath Project – an intelligent, adaptive, and web-based learning environment for mathematics. LeActiveMath is one of the technology enhanced learning projects carried out under the 6th EU Framework Program.

Currently, LeActiveMath is being evaluated in multiple classrooms at various schools and universities by nearly 800 students located in Germany, Great Britain, and Spain.

LeActiveMath pursues a moderate constructionist learning approach and is based on well founded principles from the didactic and cognitive sciences, such as the PISA subjects. LeActiveMath stimulates participative learning and self-discovery and influences motivation and the learning process in a positive way. The system benefits from semantic representation of knowledge in a variety of ways, e.g., on request, LeActiveMath actively prepares individual courses that are adjusted to the level of knowledge, the objectives, and the situational context of the student.

LeActiveMath also includes a broad selection of tools: dynamic tutorials guide students through their individual learning paths; cleverly designed tasks provide comprehensive feedback options; an open learning model permits students to access an evaluation of their performance; a user interface to a computer-algebra system facilitates complex calculations. It is also possible to integrate other tools such as the concept mapping tool at a reasonable cost.

The system is multilingual and interdisciplinary, which means it can also be deployed in subjects other than mathematics.

Additional information
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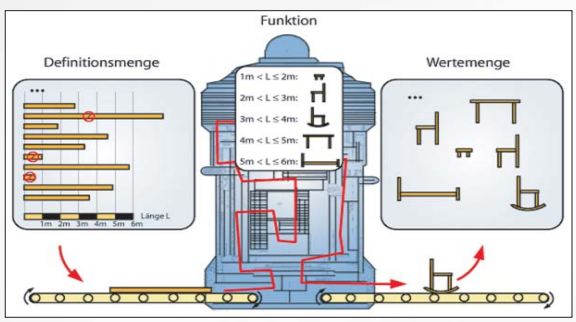
ActiveMath-EU: Distribution of ActiveMath

Under the ActiveMath-EU project, fundamental services were developed, the community was expanded, and new contacts with existing networks were established – all with the aim of promoting the learning environment called ActiveMath. Now in the follow-on project, LeActiveMath, educational partners in Germany, Hungary, The Netherlands, France, and The Czech Republic are all active participants.

The purpose of the follow-on project is to promote the stronger utilization of Open-Source Distribution of ActiveMath. Activities include the establishment of a community platform for collaboration with Wikis, distribution lists, weblogs, etc., more publicity for proven applications and methods, and new manuals and instructions for educators and students. Furthermore, ActiveMath will be integrated into well-known open-source learning systems so that student-teachers in the partner countries will be able to participate in intensive ActiveMath courses.

The ActiveMath platform, with its high quality content for differential calculation, is already available in



German, English, and Spanish. Future plans include translation into other languages (Czech, Hungarian, Dutch, and French) and the development of new types of tasks. Content and tools borrowed from other projects is also being integrated. The project will contribute to the decision-making processes of the committees on standardization, IMS-QTI and W3C Math.

Additional information
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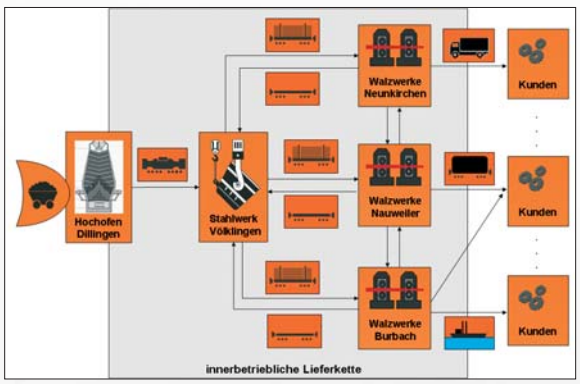
MAS-Dispo XT – Multi-agent Technology for Steel Production



DFKI, in a project with Saarstahl AG has jointly designed, developed, and implemented MAS-DISPO XT, a planning and scheduling system to manage the complex supply chain at the modern steel plant. Flexibility and rapid reorganization are essential criteria for production planning and control in dynamic environments such as those commonly found in the steel industry. A lack of transparency in operational and material planning can lead to significant problems in production and in the management of the flow of materials.

MAS-Dispo XT is the advanced version of a joint DFKI-Saarstahl planning and scheduling program developed for the steel plant's production processes. The earlier version was successfully deployed and implemented at the beginning of 2006. The long term plan is for MAS-DISPO XT to provide a complete planning, production and control system to manage the intricate supply chain in the production of steel. At the core of the MAS-DISPO system is a short range planning function for the steelworks based on the daily planning targets. The job of the planning unit is to determine the optimal utilization of the steel work aggregate and manufacturing resources. In the event of an irregularity in the processes, the planning and scheduling system facilitates a rapid return to standard manufacturing operations. The system is installed at the control room and supports the planning and control of the steel mills by calculating an optimal solution for the specified targets of a daily program. Selectable criteria are considered in conjunction with continuously updated data received from the mills and then compared to the calculated planning figures, such that any variance is recognized early enough to allow timely corrective actions to be taken.

The priority of the current development phase, which lasts until the Fall of 2007, is the interplay in steel production that occurs after the rolling process with the subsequent manufacturing steps such as annealing or surface treatments.

Services offered by DFKI
Generic, agent-based solutions in support of planning and control systems for the steel industry

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DFKI Interview Roland Vogt

Roland Vogt heads the IT Security Testing Center at DFKI, where IT products and systems are independently tested on the basis of international Common Criteria for IT Security Evaluation.

What do you see as the application potential in your research?
Today, AI systems are characterized by the processing of complex data in multimodal networked infrastructures. IT security aspects frequently play a key role in discussions about the relilability of intelligent systems and independent testing is an important marketability factor.

When did your interest in artifical intelligence begin and how have AI processes changed since that time?
The formal logic in deductive systems has been a big part of my work since the end of the 1980s. I remember, at the start of my work at DFKI, the use of formal methods in security models was limited to a few individual applications. Today, security certification is a standard requirement for secure systems and products.

What are the greatest challenges and opportunities for AI systems today?
In a multimedia information society, AI systems hold the promise of a dramatic improvement in the quality of individual adaptive services. The greatest challenge now is how to provide user security to the wide range of technical possibilities.

What do you enjoy doing when you are not working as a research scientist?
I am a friend of good music and even try to make it myself.

Are there parallels to your professional life?
The interpretation of good music requires great care and precision and these same qualities are needed to obtain good results in the evaluation of IT security.

What are your current projects?
My current work is focused on software development support to the City of Hamburg in programming a digital pen voting system scheduled for employment in the elections of 2008.

Final Event of the Informatics Year – Science Year 2006 in Berlin

Photo: Informatikjahr

At the festivities marking the end of the Informatics Year – Science Year 2006 at the berliner congress centrum (bcc) on December 18, 2006, Prof. Dr. Wolfgang Wahlster, delivered the keynote address on the topic of „The semantic challenge in informatics".

In his speech about the role of semantics in informatics for mankind, Prof. Wahlster bridged the successful Informatics Year 2006 and the Year of the Humanities 2007.

The key to the semantic turning point and the greatest challenge in the future for informatics is adapting information technology to human needs. Here, this does not refer to an interaction through complicated artificial languages with keyboard and mouse, rather the cooperation of software systems in everyday situations with speech and gestures in a future „informatics for humans".

In the World Wide Web, the turning point in semantics leads from the syntactical web, with its information overflow through the reduction of text files to mindless patterns of letters, to a highly precise response behavior that places meaningful relationships as the central focus.

In Web 3.0, the common objects of daily life are networked online forming an „Internet of things" - from mobile phones to cameras, from cars to shopping carts. Humans will not be aware of the digital network that surrounds them - it will simply be there, as an all-around intelligence.

The conclusion of the speech by Prof. Wahlster emphasized the necessity of the Year of Information Technologies and highlighted the role of information technology as a cross-sector technology, a motor for innovation, and catalyst for economic growth.

The complete text of the speech is available online (in German only) under the
www.dfki.de/pressemitteilungen.

Two new DFKI shareholders from the DAX 30

Since October 2006, Deutsche Post World Net AG (DPWN) has been an industry partner of DFKI. The share purchase by DPWN makes a lot of sense in the context of the impressive „DFKI Innovation Roadmap", which is intended to insure the early integration of the needs of the DPWN customers into future IT development. On the other hand, Deutsche Post World Net as a global logistics company opens new and exciting fields of application for DFKI. For example, multiagent systems, speech dialog systems, robots, and SmartLabels have an extraordinary potential in the field of logistics.

Deutsche Post

In February 2007, DFKI expanded the circle of shareholders to include BMW Group Research and Technology. The fully owned subsidiary of BMW AG is planning to cooperate with DFKI Labs on bilateral as well as publicly funded projects. The partnership will also include the exchange of masters and doctorate candidates as well as a visiting scientist program. The internet of the future and its importance to wireless applications will play an important role in joint projects of the future. An important challenge here will be the use of semantic technologies for the content-related communication between

BMW Group

vehicles and the transportation infrastructure. Furthermore, the joint development of the next generation of multimodal dialog interfaces for driver assistance systems should succeed in integrating all cognitive senses of the driver and take account of his actual load capacity in the context of an actual driving situation.

News in brief

THE SCIENTIFIC ADVISORY BOARD OF DFKI

The Scientific Advisory Board (SAB) of DFKI regularly advises and evaluates ongoing projects and new project applications at DFKI.

The SAB meets at least once each year – most recently at the Saarbrücken location in February 2007 – to hear presentations and review the progress especially, of ongoing BMBF projects as well as to consider new project applications.

l.-r. Prof. H. Bunke, Prof. C. Freksa, Prof. R. Goldman, Prof. A. Bundy, Prof. N. Jennings, Prof. D. Scott, Prof. O. Stock

THE INNOVATION TRIANGLE

Within the framework of the German EU Presidency, the States of Rhineland-Palatinate, The Saarland, and the Free Hanseatic City of Bremen invited DFKI to the Rhineland-Palatinate delegation in Brussels to make a presentation. This presentation included Scorpion, an eight legged walking robot from DFKI-Bremen Labs and the COMPASS2008 system, a multilingual, digital travel guide for visitors to the Chinese capital city of Beijing.

l.-r. Dr. P. Zangl, European Commission; Prof. W. Wahlster; Dr. S. Graul, EADS-Astrium

„GOLDENE ENTE" FOR PROFESSOR WAHLSTER

The Landespressekonferenz Saar (LPK-Saar) has honored Prof. Wolfgang Wahlster with the highly respected „Goldene Ente" Award. At a ceremony held in December 2006, members of the LPK presented the prize in recognition of the open communication style of the DFKI Director. One of the major reasons given for the choice was the fact the internationally respected scientist was always willing to take the time to explain his research to the public in an understandable manner. The „Goldene Ente" is awarded each year by the LPK to a person or group that has demonstrated an exceptional degree of cooperation with the media. Previous winners of the award include the Prime Minister of Luxemburg, Jean-Claude Juncker and Saarland's Minister President, Peter Müller.

PROF. DR.-ING. DETLEF ZÜHLKE ELECTED TO ADVISORY COUNCIL OF GMA

The head of the Center for Human Machine Interaction (ZMMI) has been elected for an additional three year period to the Council Board of the VDI/VDE-Society for Measurement and Automatic Control (GMA). This association represents approximately 13,000 members in the area of automation technology in Germany, Austria, and Switzerland. Prof. Zühlke was also elected to the delegates assembly of the VDE Association for Electrical, Electronic & Information Technologies as well as the Scientific Advisory Board of the VDE-ITG.

DFKI RESEARCHER WINS IT AWARD

Benjamin Horak, Department of Knowledge Management was honored at the „IBPM Conference – Information & Business Process Management" with the IBPM Award 2007 in Cologne last January. His doctoral thesis, „ConTag – A Tagging System linking the Semantic Desktop with Web 2.0" earned him the top prize in the category DMS (Document Management Systems).

Publications

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

S. Agne; C. Reuschling; A. Dengel
DynaQ – Dynamic Queries for Electronic Document Management. In: 10th IEEE International Enterprise Distributed Object Computing Conference Workshops (EDOCW-2006), October 15–20, Hong Kong, China, IEEE, 2006.

H. Ali; C.H. Lampert; T.M. Breuel
Satellite Tracks Removal in Astronomical Images. In: J. F. Martínez-Trinidad; J.A. Carrasco Ochoa; J. Ariel; J. Kitt (Eds.). Progress in Pattern Recognition, Image Analysis and Applications. 11th Iberoamerican Congress in Pattern Recognition (CIARP-2006), November 14–17, Cancún, Mexico, Pages 892–901, LNCS 4225, Springer, 2006.

A. Ankolekar; P. Buitelaar; P. Cimiano; P. Hitzler; M. Kiesel; M. Krötzsch; H. Lewen; G. Neumann; M. Sintek; T. Tserendorj; R. Studer
SmartWeb: Mobile Access to the Semantic Web. In: Proceedings of the Demo Session at the 5th International Semantic Web Conference (ISWC-2006), November 5–9, Athens, GA, USA, 2006.

I. Aslan; M. Schwalm; J. Baus; A. Krüger; T. Schwartz
Acquisition of Spatial Knowledge in Location Aware Mobile Pedestrian Navigation Systems. In: Proceedings of the 8th international Conference on Human Computer Interaction with Mobile Devices and Services (MobileHCI-2006), September 12–15, Helsinki, Finland, Pages 105–108, ACM International Conference Proceeding Series, Vol. 159, ACM Press, 2006.

D. Aumer; K. Leyking
Realisierung eines kompetenzbasierten Weiterbildungsmanagements für dezentrale Vertriebsorganisationen. In: Zeitschrift für eLearning, Vol. 1, No. 2, Pages 6–16, StudienVerlag, 2006.

S. Autexier; C. Benzmüller; A. Fiedler; H. Lesourd
Integrating Proof Assistants as Plugins in a Scientific Editor. In: M. Kohlhase. OMDOC – An Open Markup Format for Mathematical Documents [version 1.2]. Pages 309–312, LNAI 4180, Springer, 2006.

S. Autexier; D. Dietrich
Synthesizing Proof Planning Methods and ømega-Ants Agents from Mathematical Knowledge. In: J.M. Borwein; W.M. Farmer (Eds.). Proceedings of the 5th International Conference on Mathematical Knowledge (KM-2006), August 11–12, Wokingham, England, Pages 94–109, LNAI 4108, Springer, 2006.

S. Autexier; C. Sacerdoti-Coen
A Formal Correspondence between OMDoc with Alternative Proofs and the $\bar{\lambda}\mu\tilde{\mu}$-Calculus. In: J.M. Borwein; W.M. Farmer (Eds.). Proceedings of the 5th International Conference on Mathematical Knowledge (MKM-2006), August 11–12, Wokingham, England, Pages 67–81, LNAI 4108, Pages 67–81, Springer, 2006.

T. Avgustinova
Language Family Oriented Perspective in Multilingual Grammar Design. Linguistic International, Vol. 17, Peter Lang – Europäischer Verlag der Wissenschaften, 2007.

T. Avgustinova
Grammarical Relatedness of Slavic Languages Taken Seriously. In: Proceedings of the 5th Formal Approaches South Slavic and Balkan Languages – Dedicated to the 75th Anniversary of Prof. Jordan Penchev (FASSBL-2006), October 18–20, Sofia, Bulgaria, Pages 19–22, 2006.

S. Bartsch; F. Kirchner
Robust Control of a Humanoid Robot Using a Bio-Inspired Approach Based on Central Pattern Generators, Reflexes and Proprioceptive Feedback. In: Proceedings of the IEEE International Conference on Robotics and Biomimetics (ROBIO-2006), December 17–20, Kunming, China, Pages 1547–1552, IEEE, 2006.

N. Basselin; A. Kröner
From Personal Memories to Sharable Memories. In: M. Schaaf; K.-D. Althoff (Eds.). Hildesheimer Informatikberichte. Lernen – Wissensentdeckung – Adaptivität (LWA-2006), 14th Workshop on Adaptivity and User Modeling in Interactive Systems (ABIS-2006), October 9–11, Hildesheim, Germany, Pages 21–26, 2006.

U. Basters; M. Klusch
RS2D: Fast Adaptive Search for Semantic Web Services in Unstructured P2P Networks. In: I. Cruz et al. (Eds.). Proceedings of the 5th International Semantic Web Conference (ISWC-2006), November 5–9, Athens, GA, USA, Pages 87–100, LNCS 4273, Springer, 2006.

J. Baus; R. Wasinger; I. Aslan; A. Krüger; A. Maier; T. Schwartz
Auditory Perceptible Landmarks in Mobile Navigation. In: Proceedings of the 10th International Conference on Intelligent User Interface (IUI-2007), January 28–31, Hawaii, USA, Pages 302–304, ACM Press, 2007.

F. Bergenti; C. Cáceres; A. Fernández; N. Fröhlich; H. Helin; O. Keller; A. Kinnunen; M. Klusch; H. Laamanen; A. Lopes; S. Ossowski; H. Schuldt; M. Schumacher
Context-aware Service Coordination for Mobile e-Health Applications. In: H. Stormer; A. Meier; M. Schumacher (Eds.). Proceedings of the European Conference on EHealth (ECEH-2006), October 12–13, Fribourg, Switzerland, Pages 119–130, LNI P-91, Gesellschaft für Informatik (GI), 2006.

S. Berkovsky; L. Aroyo; D. Heckmann; G.-J. Houben; A. Kröner; T. Kuflik; F. Ricci
Predicting User Experiences trough Cross-Context Reasoning. In: M. Schaaf; K.-D. Althoff (Eds.). Hildesheimer Informatikberichte. Lernen – Wissensentdeckung – Adaptivität (LWA-2006), 14 th Workshop on Adaptivity and User Modeling in Interactive Systems (ABIS-2006), October 9–11, Hildesheim, Germany, Pages 27–31, 2006.

P. Buitelaar; P. Cimiano; A. Frank; S. Racioppa
SOBA: SmartWeb Ontology-based Annotation. In: Proceedings of the Demo Session at the 5th International Semantic Web Conference (ISWC-2006), November 5–9, Athens, GA, USA, 2006.

C. Cáceres; A. Fernández; H. Helin; O. Keller; M. Klusch
Context-Aware Service Coordination for Mobile Users. In: P. Cunningham; M. Cunningham (Eds.). Exploiting the Knowledge Economy: Issues, Applications and Case Studies, Part 2, Information and Communication Technologies and the Knowledge Economy, Pages 1672–1679, IOS Press, 2006.

P. Chikova; K. Leyking
EXPLAIN – Eine web-basierte Authoring Management Plattform. In: LERNET-Report, Nr. 19, Pages 8–10, 2006.

P. Cimiano; A. Frank; U. Reyle
UDRT-based Semantics Construction for LTAG – and What it Tells us About the Role of Adjunction in LTAG. In: Proceedings of the 7th International Workshop on Computational Semantics (IWCS-2007), January 10–12, Tilburg, The Netherlands, 2007.

S. Decker; J. Park; L. Sauermann; S. Auer; S. Handschuh (Eds.)
Proceedings of the Semantic Desktop and Social Semantic Collaboration Workshop (SemDesk-2006), located at the 5th International Semantic Web Conference (ISWC-2006), November 6, Athens, GA, USA, Series CEUR-WS, Vol. 202, Online-Proceedings, 2006.

T. Declerck; P. Buitelaar; M. Alcantara; M. Labský; V. Svátek
Adding Semantic Metadata to Audio-Video Material by Automatic Analysis of Complementary Sources. In: Proceedings of the 3rd International Conference on Visual Information Engineering (VIE-2006), September 26–28, Bangalore, India, 2006.

S. Denne
Verifying Properties of (Timed) Event Driven Process Chains by Transformation to Hybrid Automata. In: M. Nüttgens; F.J. Rump; J. Mendling (Eds.). EPK 2006 – Geschäftsprozessmanagement mit Ereignisgesteuerten Prozessketten, 5. Workshop der Gesellschaft für Informatik (GI) und Treffen ihres Arbeitskreises WI-EPK, November 30 – Dezember 1, Vienna, Austria, Pages 157–176, Series CEUR-WS, Vol. 224, Online-Proceedings, 2006.

A. Dengel
Six Thousand Words about Multi-Perspective Personal Document Managment. In: Proceedings of the 10th IEEE International Enterprise Distributed Object Computing Conference Workshops (EDOCW-2006), October 17, Hongkong, China, CD-ROM and Online Proceedings, IEEE, 2006.

R. Engel
SPIN: A Semantic Parser for Spoken Dialog Systems. In: Proceedings of the 5th Slovenian and 1st International Language Technology Conference (IS-LTC-2006), October 9–10, Ljubljana, Slovenia, Online-Proceedings, 2006. http://nl.ijs.si/is-ltc06/proc/

N. Fernández; L. Sauermann; L. Sánchez; A. Bernardi
PIMO Population and Semantic Annotation for the Gnowsis Semantic Desktop. In: S. Decker; J. Park; L. Sauermann; S. Auer; S. Handschuh (Eds.). Proceedings of the Semantic Desktop and Social Semantic Collaboration Workshop (SemDesk-2006), located at the 5th International Semantic Web Conference (ISWC-2006), November 6, Athens, GA, USA, Series CEUR-WS, Vol. 202, Online-Proceedings, 2006.

P. Fettke
State-of-the-Art des State-of-the-Art. Eine Untersuchung der Forschungsmethode „Review" innerhalb der Wirtschaftsinformatik. In: Wirtschaftsinformatik, Vol. 48, No. 4, Pages 257–266, Vieweg, 2006.

P. Fettke; P. Loos (Eds.)
Reference Modeling for Business Systems Analysis, IDEA Group, 2006.

P. Fettke; J. Zwicker; P. Loos
Using UML for Reference Modeling. In: P. Rittgen (Ed.). Enterprise Modeling and Computing with UML, Pages 174–206, Hershey, 2006.

A. Frank; H.-U. Krieger; F. Xu; H. Uszkoreit; B. Crysmann; B. Jörg; U. Schäfer
Question Answering from Structured Knowledge Sources. In: Journal of Applied Logic, Vol. 5, No. 1, Pages 20–48, Elsevier, 2007.

A. Frischauf; P. Libbrecht
DVI2SVG: Using the LATEX Layout on the Web. In: TUGboat, TUG-2006 Conference Proceedings, Vol. 27, No. 2, Pages 197–201, TeX Users Group (TUG), 2006.

P. Gebhard; K. H. Kipp
Are Computer-Generated Emotions and Moods Plausible to Humans. In: Proceedings of the 6th International Conference on Intelligent Virtual Agents (IVA-2006), August 21–23, Marina del Rey, CA, USA, Pages 343–356, LNAI 4133, Springer, 2006.

H. Hagen; A. Kerren; P. Dannenmann (Eds.)
Visualization of Large and Unstructured Data Sets. In: Proceedings of the 1st Workshop of the DFG's International Research Training Group Visualization of Large and Unstructured Data Sets – Applications in Geospatial Planning, Modeling, and Engineering, June 14–16, Dagstuhl, Germany, Lecture Notes in Informatics, Seminars Series, Vol. S-4, Bonn, GI-Edition, Gesellschaft für Informatik (GI), 2006.

C. Hahn; B. Fley; M. Florian; D. Spresny; K. Fischer
Social Reputation: a Mechanism for Flexible Self-Regulation of Multiagent Systems. In: Journal of Artificial Societies and Social Simulation (JASSS), Vol. 10, No. 1, 2007. http://jasss.soc.surrey.ac.uk/10/1/2.html

D. Heckmann
Ubiquitous User Modeling. Dissertationen zur Künstlichen Intelligenz, DISKI 297, AKA/IOS-Press, 2006.

D. Heckmann
Situation Modeling and Smart Context Retrieval with Semantic Web Technology and Conflict Resolution. In: T.R. Roth-Berghofer; S. Schulz; D.B. Leake (Eds.). Modeling and Retrieval of Context, Pages 34–47, LNAI 3946, Springer, 2006.

H. Holz; O. Rostanin; A. Dengel; K. Maeda; T. Suzuki; K. Kanasaki
Task-based Process Know-how Reuse and Proactive Information Delivery in TaskNavigator. In: Proceedings of the ACM 15th Conference on Information and Knowledge Management (CIKM-2006), November 6–11, Arlington, VA, USA, Pages 522–531, ACM Press, 2006.

M. Homik; E. Melis
Using Blogs for Learning Logs. In: Proceedings of ePortfolio2006 (ElfEL-2006), October 11–13, Oxford, UK, CD-ROM Proceedings, 2006.

K. Hübner
Symmetriesignaturen für bildbasierte Anwendungen in der Robotik. Dissertation, Universität Bremen, 2006, BISS Monographs, Bd. 24, Logos Verlag, 2006.

D. Hutter
Formal Security Policies for the Web. In: Proceedings of the 1st International Conference on Information Security and Computer Forensics (ISCF-2006), December 6–8, Chennai, India, Pages 259–268, Allied Publishers Pvt Ltd., 2006.

D. Hutter; M. Klusch; M. Volkamer
Information Flow Analysis Based Security Checking of Health Service Composition Plans. In: H. Stormer; A. Meier; M. Schumacher (Eds.). Proceedings of the European Conference on EHealth (ECEH-2006), October 12–13, Fribourg, Switzerland, Pages 59–70, LNI P-91, Gesellschaft für Informatik (GI), 2006.

D. Hutter; M. Volkamer
Information Flow Control for Distributed Usage Control. In: 4th International Workshop for Technical, Economic and Legal Aspects of Business Models for Virtual Goods (VirtualGoods-2006), December 13–15, Leeds, UK, Pages 192–195, Firenze University Press, 2006.

S. Jain; S. Lange; S. Zilles
Towards a Better Understanding of Incremental Learning. In: J. L. Balcázar; P.M. Long; F. Stephan (Eds.). Proceedings of the 17th International Conference on Algorithmic Learning Theory (ALT-2006), October 7–10, Barcelona, Spain, Pages 169–183, LNAI 4264, Springer, 2006.

P. Kärger; C. Ullrich; E. Melis
Integrating Learning Object Repositories Using a Mediator Architecture. In: Innovative Approaches for Learning and Knowledge Sharing. Proceedings of the 1st European Conference on Technology Enhanced Learning (EC-TEL-2006), October 1–4, Crete, Greece, Pages 185–197, LNCS 4227, Springer, 2006.

Y. Kassahun; M. Edgington; J. de Gea; F. Kirchner
Exploiting Sensorimotor Coordination for Learning to Recognize Objects. In: 20th International Joint Conference on Artificial Intelligence, (IJCAI-07), January 6-12, Hyderabad, India, Pages 883-888, Online-Proceedings, 2007.

Y. Kassahun; M. Edgington; J. de Gea; F. Kirchner
Towards a Multimodal Sensorimotor Coordination Based Object Recognition System. In: Proceedings of the IEEE International Conference on Robotics and Biomimetics (ROBIO-2006), December 17-20, Kunming, China, 2006.

F. Kaufer; M. Klusch
WSMO-MX: A Logic Programming Based Hybrid Service Matchmaker. In: Proceedings of the 4th IEEE European Conference on Web Services (ECOWS-06), December 4-6, Zurich, Switzerland, IEEE CS Press, Pages 161-170, 2006.

M. Kipp; K.H. Kipp; A. Ndiaye; P. Gebhard
Evaluating the Tangible Interface and Virtual Characters in the Interactive COHIBIT Exhibit. In: Proceedings of the 6th International Conference on Intelligent Virtual Agents (IVA-2006), August 21-23, Marina del Rey, CA, USA, Pages 434-444, LNAI 4133, Springer, 2006.

S. Klink; K. Kise; A. Dengel; M. Junker; S. Agne
Document Information Retrieval. In: B. B. Chaudhuri (Ed.). Digital Document Processing: Major Directions and Recent Advances. Advances in Pattern Recognition Series, Springer, 2007.

M. Klusch; A. Gerber
Evaluation of Service Composition Planning with OWLS-XPlan. In: Proceedings of the IEEE/WIC/ACM International Conference on Web Intelligence and International Agent Technology (WI-IAT-2006), December 18-22, Hongkong, China, Pages 117-120, IEEE, 2006.

M. Klusch; A. Gerber
Fast Composition Planning of OWL-S Services and Application. In: Proceedings of the 4th IEEE European Conference on Web Services (ECOWS-2006), December 4-6, Zurich, Switzerland, Pages 181-190, IEEE CS Press, 2006.

M. Klusch; K.-U. Renner
Fast Dynamic Re-Planning of Composite OWL-S Services. In: Proceedings of the IEEE/WIC/ACM International Conference on Web Intelligence and International Agent Technology (WI-IAT-2006), December 18-22, Hongkong, China, Pages 134-137, IEEE, 2006.

B. Krieg-Brückner; H. Shi
Orientation Calculi and Route Graphs: Towards Semantic Representations for Route Descriptions. In: M. Raubal; H.J. Miller; A.U. Frank; M.F. Goochild (Eds.). Geographic Information Science. 4th International Conference (GIScience-2006), September 20-23, Münster, Germany, Pages 234-250, LNCS 4197, Springer, 2006.

C.H. Lampert; O. Wirjadi
Anisotropic Gaussian Filtering Using Fixed Point Arithmetic. In: Proceedings of the 2006 International Conference on Image Processing (ICIP-2006), October 8-11, Atlanta, GA, USA, Pages 1565-1568, IEEE, 2006.

K. Leyking; P. Chikova; L. Lehmann
Technology-Enhanced Learning Meets CIM - Integrated Content Development Processes. In: C. Rensing (Ed.). Proceedings der Pre-Conference Workshops der 4. e-Learning Fachtagung Informatik der Gesellschaft für Informatik (GI) (DeLFI-2006), September 11-14, Darmstadt, Germany, Pages 43-50, Logos Verlag, 2006.

K. Leyking; P. Chikova; G. Martin
Learning Management: A Business-process Driven Perspective. In: Proceedings of the 2nd International Conference on Professional Training Facts, November 15, Stuttgart, Germany, Fraunhofer Institut für Arbeitwirtschaft und Organisation (FhG-IAO), Online-Proceedings, 2006.

K. Leyking; F. Dreifus; J. Ziemann; A. Martin; D. Werth
Business Service Management. In: The Modern Information Technology in the Innovation Processes of the Industrial Enterprises. Proceedings of the 8th International Conference (MITIP-2006), September 11-12, Budapest, Hungary, Pages 155-160, 2006.

P. Libbrecht; C. Brooks
Publication of Distributed Linked Content. In: Proceedings of the 1st Doctoral Consortium in Technology Enhanced Learning (at ECTEL-2006), October 2, Crete, Greece, Pages 21-32, 2006.

P. Libbrecht; E. Melis
Methods to Access and Retrieve of Mathematical Content in ActiveMath. In: A. Iglesias ; N. Takayama (Eds.). Proceedings of the 2nd International Congress on Mathematical Software (ICMS-2006), September 1-3, Castro Urdiales, Spain, Pages 331-343, LNCS 4151, Springer, 2006.

M. Löckelt; N. Pfleger
Augmenting Virtual Characters for More Natural Interaction. In: S. Göbel; R. Malkewitz; I. Iurgel (Eds.). Technologies for Interactive Digital Storytelling and Entertainment. Proceedings of the 3rd International Conference on Technologies for Interactive Digital Storytelling and Entertainment (TIDSE-2006), December 4-6, Darmstadt, Germany, Pages 231-240, LNCS 4326, Springer, 2006.

P. Loos; P. Fettke
Zum Beitrag empirischer Forschung in der Informationsmodellierung. In: Peter Loos, Helmut Krcmar (Eds.). Architekturen und Prozesse. Strukturen und Dynamik in Forschung und Unternehmen, Pages 33-50, Springer, 2007.

P. Loos; H. Krcmar (Eds.)
Architekturen und Prozesse. Strukturen und Dynamik in Forschung und Unternehmen. Springer, 2007.

T. Matheis; B. Simon; D. Werth
Process-Based Performance Measurement of Networked Businesses. In: Exploiting the Knowledge Economy: Issues, Applications and Case Studies, Part 1, Pages 20-27, IOS Press, 2006.

T. Matheis; B. Simon; D. Werth; P. Loos
Framework for Collaborative Performance Measurement. In: The Modern Information Technology in the Innovation Processes of the Industrial Enterprises. Proceedings of the 8th International Conference (MITIP-2006), September 11-12, Budapest, Hungary, Pages 81-86, 2006.

E. Melis; G. Goguadze
Representation of Misconceptions. In: Kinshuk; D.G. Sampson; J.M. Spector; P. Isaias (Eds.). Proceedings of the International Conference on Cognition and Exploratory Learning in Digital Age (CELDA-2006), December 8-10, Barcelona, Spain, Pages 208-214, IADIS Press, 2006.

E. Pecourt
Sharing Knowledge in Virtual Environments. In: S. Göbel; R. Malkewitz; I. Iurgel (Eds.). Proceedings of the 3rd International Conference on Technologies for Interactive Digital Storytelling and Entertainment (TIDSE-2006), December 4-6, Darmstadt, Germany, Pages 187-192, LNCS 4326, Springer, 2006.

T. Pederson; H. Pinto; M. Schmitz; C. Stahl; L. Terrenghi (Eds.)
Sonderforschungsbereich 378 - Resource-Adaptive Cognitive Processes, Memo Nr. 86: Modelling and Designing User Assistance in Intelligent Environments (MODIE 2006), September 12, Espoo, Finland, in Conjunction with the 8th International Conference on Human Computer Interaction with Mobile Devices and Services (MobileHCI-2006), Saarland University, 2006.

N. Pfleger; J. Schehl
Development of Advanced Dialog Systems with PATE. In: Proceedings of the 7th International Conference on Spoken Language Processing (INTERSPEECH2006 - ICSLP), September 17-21, Pittsburgh, PA, USA, Pages 1778-1781, ISCA, 2006.

N. Reithinger; P. Gebhard; M. Löckelt; A. Ndiaye; N. Pfleger; M. Klesen
VirtualHuman - Dialogic and Affective Interaction with Virtual Characters. In: Proceedings of the 8th International Conference on Multimodal Interfaces (ICMI-2006), November 2-4, Banff, Canada, Pages 51-58, ACM, 2006.

M. Romanelli; D. Sonntag; N. Reithinger
Connecting Foundational Ontologies with MPEG-7 Ontologies for Multimodal QA. In: Poster and Demo Proceedings of the 1st International Conference on Semantics and Digital Media Technology (SAMT-2006), Athens, Greece, December 6-8, Pages 37-38, 2006.

O. Rostanin; C. Ullrich; H. Holz; S. Song
Project TEAL: Add Adaptive e-Learning to your Workflows. In: K. Tochtermann; H. Maurer (Eds.). Proceedings of the 6th International Conference on Knowledge Management (I-KNOW-2006), September 6-8, Graz, Austria, Pages 395-402, 2006.

T.R. Roth-Berghofer; M.H. Göker; H. Altay Güvenir (Eds.)
Advances in Case-Based Reasoning. Proceedings of the 8th European Conference (ECCBR-2006), September 4-7, Fethiye, Turkey, LNAI 4106, Springer, 2006.

L. Sauermann; G. Aastrand Grimnes; M. Kiesel; C. Fluit; H. Maus; D. Heim; D. Nadeem; B. Horak; A. Dengel
Semantic Desktop 2.0: The Gnowsis Experience. In: I. Cruz et al. (Eds.). Proceedings of the 5th International Semantic Web Conference (ISWC-2006), November 5-9, Athens, GA, USA, Pages 887-900, LNCS 4273, Springer, 2006.

C. Seel; B. Simon; D. Werth
Business Rule-enabled Process Modelling. In: P. Cunningham; M. Cunningham (Eds.). Exploiting the Knowledge Economy: Issues, Applications and Case Studies, Part 1, Pages 36-43, IOS Press, 2006.

C. Seel; B. Simon; D. Werth
Rule-enhanced Business Process Modelling. In: The Modern Information Technology in the Innovation Processes of the Industrial Enterprises. Proceedings of the 8th International Conference (MITIP-2006), September 11-12, Budapest, Hungary, Pages 193-198, 2006.

F. Shafait; A. Hasan; D. Keysers; T.M. Breuel
Layout Analysis of Urdu Document Images. In: 10th IEEE International Multitopic Conference (INMIC-2006), December 23-24, Islamabad, Pakistan, CD-ROM Proceedings, 2006.

M. Siebert; P. Smits; L. Sauermann; A. Dengel
Increasing Search Quality with the Semantic Desktop in Proposal Development. In: U. Reimer; D. Karagiannis (Eds.). Proceedings of the 6th International Conference on Practical Aspects of Knowledge Management (PAKM-2006), November 30 - December, 1, Vienna, Austria, Pages 279-290, LNCS 4333, Springer, 2006.

J. Siekmann; C. Benzmüller; S. Autexier
Computer Supported Mathematics with ømega. In: Journal of Applied Logic, Vol. 4, No. 4, Pages 533-559, Elsevier, 2006.

D. Sonntag; R. Engel; G. Herzog; A. Pfalzgraf; N. Pfleger; M. Romanelli; N. Reithinger
Smart Web Handheld - Multimodal Interaction with Ontological Knowledge Bases and Semantic Web Services. In: Proceedings of the 1st International Workshop on AI for Human Computing (AI4HC-2007) in Conjunction with IJCAI-2007, Hyderabad, India, January 6, Pages 115-122, 2007.

D. Spenneberg; A. Strack; H. Zschenker; F. Kirchner; J. Hilljegerdes; S. Bosse
Control of a Bio-inspired Four Legged Robot for Exploration of Uneven Terrain. In: Proceedings of the 9th Workshop on Advanced Space Technologies for Robotics and Automation (ASTRA-2006), November 28-30, Noordwijk, The Netherlands, ESA-ESTEC, 2006.

D. Vanderhaeghen; P. Loos
Collaborative Management of Process Models in Enterprise Networks. In: M. Martínez; R. Scherer (Eds.). Proceedings of the 6th European Conference on Product and Process Modelling. eWork and eBusiness in Architecture, Engineering and Construction (ECPPM-2006), September 13-15, Valencia, Spain, Pages 87-92, Balkema - Proceedings and Monographs in Engineering, Water and Earth Sciences, Taylor & Francis, 2006.

D. Vanderhaeghen; P. Loos
Distributed Model Management Platform for Virtual Enterprise Networks. In: Proceedings of the 7th IFIP TC5 WG 5.5 Working Conference on Virtual Enterprises (PRO-VE-2006), September 25-27, Helsinki, Finland, Pages 507-514, Series IFIP International Federation for Information Processing , Vol. 224, 2006.

W. Wahlster; A. Dengel
Web 3.0: Convergence of Web 2.0 and the Semantic Web. In: Technology Radar Feature Paper, Edition II/2006, Pages 1-23, Deutsche Telekom Laboratories, 2006.

P. Walter; D. Werth
Managing Collaborative Business Process Lifecycles with Peer-To-Peer Technology. In: The Modern Information Technology in the Innovation Processes of the Industrial Enterprises. Proceedings of the 8th International Conference (MITIP-2006), September 11-12, Budapest, Hungary, Pages 185-191, 2006.

P. Walter; D. Werth
P2P- Based Performance Measurement of Networked Businesses. In: P. Cunningham; M. Cunningham (Eds.). Exploiting the Knowledge Economy: Issues, Applications and Case Studies, Part 1, Pages 1115-1123, IOS Press, 2006.

N. Weber; P. Buitelaar
Web-based Ontology Learning with ISOLDE. In: Proceedings of the Workshop on Web Content Mining with Human Language at the International Semantic Web Conference (ISCW-2006), November 6, Athens, GA, USA, 2006.

D. Werth; K. Leyking; F. Dreifus; J. Ziemann; A. Martin
Managing SOA through Business Services - A Business-oriented Approach to Service-Oriented Architectures. In: Proceedings of the 2nd International Workshop on Engineering Service-Oriented Applications: Design and Composition (WESOA-2006) in Conjunction with 4th International Conference on Service Oriented Computing (ICSOC-2006), December 4, Chicago, MA, USA, Pages 5-17, 2006.

J. Ziemann; K. Leyking; T. Kahl; D. Werth
SOA Development Based on Enterprise Models and Existing IT Systems. In: P. Cunningham; M. Cunningham (Eds.). Exploiting the Knowledge Economy: Issues, Applications and Case Studies, Pages 83-98, IOS Press, 2006.

S. Zilles
An Approach to Intrinsic Complexity of Uniform Learning. In: Theoretical Computer Science, Vol. 364, No. 1, Pages 42-61, Elsevier, 2006.

C. Zinn
Bootstrapping a Semantic Wiki Application for Learning Mathematics. In: S. Schaffert; Y. Sure (Eds.). Semantic Systems. From Visions to Applications. Proceedings of the SEMANTICS-2006 Conference, November 28-30, Vienna, Austria, Pages 255-260, Austrian Computer Society, 2006.

C. Zinn; O. Scheuer
Getting to Know Your Student in Distance-Learning Contexts. In: Innovative Approaches for Learning and Knowledge Sharing. Proceedings of the 1st European Conference on Technology Enhanced Learning (ECTEL-2006), October 1-4, Crete, Greece, Pages 437-451, LNCS 4227, Springer, 2006.

DFKI – Simply Innovation

Kaiserslautern Site

The German Research Center for Artificial Intelligence (DFKI GmbH), with facilities in Kaiserslautern, Saarbrücken and Bremen, is the country's leading research center in the area of innovative software technology for commercial application. 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 nonprofit organization by several renowned German IT companies, the Fraunhofer Gesellschaft and a large-scale research facility. 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.

Because of the increasingly short cycles of innovation in the field of information technology, the lines between research, application related development, and conversion to products are becoming blurred. This is why DFKI projects typically include the entire spectrum from basic application-based research to market and customer oriented development of product functions.

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

Projects at DFKI are organized under one of the following six areas of research:

- Image Understanding and Pattern Recognition (Director: Professor Thomas Breuel)
- Knowledge Management (Director: Professor Andreas Dengel)
- Intelligent Visualization and Simulation Systems (Director: Professor Hans Hagen)
- Deduction and Multiagent Systems (Director: Professor Jörg Siekmann)
- Language Technologies (Director: Professor Hans Uszkoreit)
- Intelligent User Interfaces (Director: Professor Wolfgang Wahlster)

Also integrated within DFKI are the Institute for Information Systems (IWi) directed by Professor Peter Loos, and the Center for Human-Machine Interaction (ZMMI), under the leadership of Professor Detlef Zühlke. The new DFKI-Lab Bremen is host to the research groups Robotics and Safe and Secure Cognitive Systems directed by Prof. Kirchner and Prof. Krieg-Brückner.

DFKI-Lab Bremen

The purpose of the DFKI Transfer centers listed below is to make the scientific results of DFKI research available to commercial applications:

- AICommerce – Intelligence for eBusiness
- SISO – Towards Secure Software
- smartLab – Intelligent Assistance
- TransLect – Language Technology at Work

There is a broad concentration of technological and technical know-how at the DFKI competence centers and the purpose is to manage important scientific problems in the following subject areas:

- Computational Culture
- eLearning
- Human Centered Visualization
- Semantic Web
- Language Technologies
- Virtual Office of the Future

Saarbrücken Site

With an overall annual budget in 2006 of more than € 21.0 million, the the previous year's record results of € 18.1 million were surpassed and once again a positive annual net profit was reported. The circle of DFKI industrial partners including DaimlerChrysler AG, Deutsche Telekom AG, SAP AG, IDS Scheer AG, Bertelsmann AG, and Microsoft Deutschland GmbH, has been expanded by Deutsche Post World Net (DPWN) and BMW AG. Six out of the 30 DAX companies are now DFKI shareholders.

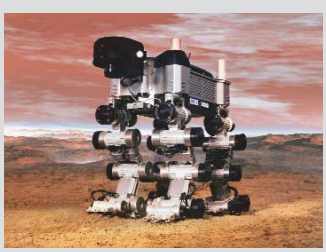
All work is organized under projects that have a clear objective and are scheduled to last for a specific period of time. This leads, among other things, to patented solutions, prototypes, or new or improved product functions. At the present time, there are more than 69 ongoing projects. Project progress is checked once a year by an independent, international group of respected experts. In addition to the BMBF grants for large, joint research projects substantial contracts from business enterprises could also be acquired in 2006. 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 referenced as the recommended structure.

December 2004 marked the 5-year review of DFKI by the Federal Ministry of Education and Research (BMBF). The evaluation is complete and the results are positive. 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 and in XtraMind Technologies GmbH (Saarbrücken).

Intelligent Solutions

for the
Knowledge Society

- Knowledge management and document analysis
- Intelligent P2P platforms
- E-Learning and e-Government
- Development of provably correct software
- Information extraction
- Intelligent web-retrieval and web services
- Multiagent systems and agent-technology
- Multimodal user interfaces and language understanding
- Intelligent visualization
- Image understanding and pattern recognition
- Usability Engineering
- Intelligent robotic systems
- Intelligent product search, data mining and text mining
- Safe and secure cognitive systems
- Organizational memory and user modeling
- Semantic web and Web 3.0
- Ambient intelligence and Assisted living
- Intelligent solutions for safety and security
- Driver assistance systems and Car2X communications



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