The German Research Center for Artificial Intelligence

Prof. Wahlster appointed to Federal Government Research Alliance

The German Federal Minister of Education and Research (BMBF), Dr. Annette Schavan, invited Prof. Wolfgang Wahlster, along with several other well-known figures from the scientific and business communities, to be a member of the “Forschungsunion Wirtschaft-Wissenschaft” (industry-science research alliance) for the current legislative period. Co-chaired by Prof. Dr. Hans-Jörg Bullenger, president of Fraunhofer Institute and Dr. Arved Oetter, industrialist and president of the Stifterverband für die Deutsche Wissenschaft (Germany’s donors’ association for sciences and the humanities), the panel is composed of leading representatives of business and science and aims to provide expert advice regarding the best strategies for Germany to further improve its reputation as a high tech country. The panel will meet six times per year, with the next meeting scheduled for 3-4 November, and receive support from an administrative office jointly funded by the FhG, Stifterverband, and BMBF.

Dr. Schavan convened the panel on June 25, 2006 at the BMBF offices for the initial session of the new circle of advisors. The new panel is to focus efforts on the construction of the major elements of the strategic circle. At the second meeting scheduled for 3-4 November, the first meeting convened on 25-26 August in Kronberg resulted in the following excerpt: “The expansion of the research infrastructure is more easily realized through the PPP model. It is also important to have many German institutions participate by submitting outstanding proposals. The ICT Prize is a measure of their innovative strength, implementation ability, and creativity.”

Deadline for applications is: December 4, 2006. Application forms are available online at www.ict-prize.org/appply.

Additional information www.ict-prize.org

The European Information and Communication Technologies Prize (ICT Prize) formerly the IST Prize, is Europe’s most important award for innovative products and services in the field of information sciences. This invitation for proposals is directed to companies, agencies, and research institutes that are working to bring new ideas to the markets in the form of innovative products and services.

The ICT Prize is organized by the European Council of Applied Sciences, Technologies and Engineering (Euro-CASE), a non-profit organization composed of national academies representing 18 European countries, with sponsorship and support from the ICT Program of the European Commission. The competition is open to organizations from 33 countries.

Approximately 50-70 candidates are nominated from among the numerous applicants. It is from these nominees that the 20 prize winners are selected and given the chance to become one of the three “Grand Prize” winners chosen each year by the ICT Executive Jury.

The ICT Prize involves more than the search for the best European innovations and recognition of entrepreneurial spirit; it also supports companies and institutes in their efforts to market their ideas. This is what makes this prize so significant: while honoring past achievements, it is supporting future success.

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AI Summer Party – Visit to the DFKI-Lab in Bremen

Nearly 300 people made their way to Bremen to participate in the DFKI-Lab’s open house. “The large number of innovative presentations, as well as, the curiosity of the visitors insured this was an unforgettable event,” said Prof. Frank Kirchner, spokesman for DFKI-Lab Bremen.

And, there was a 25 foot tall robot to greet each guest who followed up their trip to the AI symposium at the Bremen Conference Center with a visit to the nearby DFKI-Lab. Two DFKI research groups, Safe and Secure Cognitive Systems and Robotics, together with the Technology Center for Informatics (TZI) and the special research department SFB (SFB-TR8), presented the results of more than 20 projects.

The 29th Annual Conference on Artificial Intelligence was held at the Conference Center Bremen (CCB) on June 17, 2006. AI researchers from across Europe, USA, and Japan gathered to celebrate the golden anniversary of the Dartmouth Conference, held in 1956 in Hanover, New Hampshire, USA and considered as the official beginning of the era of Artificial Intelligence research.

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THE OPTIMIZATION OF BUSINESS PROCESSES WITH THE AID OF ARTIFICIAL INTELLIGENCE

DFKI and Volkswagen Financial Services AG established the Banking Intelligence Services (BIS) Lab at the end of June 2006 in Kaiserslautern.

Banking Intelligence Services Lab employs a staff of four researchers and puts the latest developments in office automation and software technology into practical applications. Besides Volkswagen Financial Services, also joining the team as a technology partner is the Lab opens for Banking Intelligence Services

Institut für Technologie und Arbeit (ITA), directed by Prof. Klaus J. Zink, on the campus of the Technical University of Kaiserslautern.

The opening remarks by Prof. Andreas Dengel underscored the importance of cooperation between the business and research sectors, especially in the development of an intelligent assistance system for knowledge intensive office work. He added: “The establishment of the Banking Intelligence Services Lab at DFKI confirms a successful strategy of actively integrating global companies in the development of innovative software. It can only strengthen the reputation of Kaiserslautern as an internationally recognized center for IT research. We are particularly excited about this joint venture between business, DFKI, and the university and hope the cooperation, which is an outstanding demonstration of the shared competencies of all participants, will lead to further successful projects.”

The development and implementation of forward-looking technologies is the major effort during the initial phase of the partnership. These include intelligent software to improve automated document processing upon entry, or for providing the optimal documents for current work processes, or the development of an interactive information kiosk.

Steel and Chips: DFKI Software Agents support Production Control

Called MasDispo, the DFKI multiagent technology for steel production has been installed at the production control room (Leitstand) at the Völklingen steel works and now supports planning and control activities there. MasDispo calculates an optimal solution for the specified daily targets based on actual data and the production planning figures. It recognizes the dependent relationships in such a way that potential variances or problems in the production processes are recognized early enough to allow corrective actions.

Dr. Klaus Richter, Operations Manager for the steel plant explains: “Because of the strict temperature controls required in plant operations, we have only short time windows in our processes. MasDispo helps us to identify and then avoid potential variances from the production plan in a timely manner.”

“MasDispo has to focus on the short term planning on the basis of daily targets at a steel plant,” said Dr. Klaus Fischer, DFKI project leader. “The goal of an agent based planning system is the optimal utilization of the manufacturing resources at the steel plant.”

The long term objective of the cooperation between DFKI and Saarstahl AG is a totally computer aided supply chain management (SCM): Customer orders dictate the output along the value chain – from the procurement of raw materials to the further processing of the steel in the rolling mills. Prof. Jörg Siekmann, Head of Research Department Deduction and Multiagent Systems explains: “What we want is a complete agent-based supply chain management system that will plan and monitor the flow of materials in the production cycle of Saarstahl AG. Nevertheless, please remember our system is not restricted only for use at steel plants. Agent based platforms can support planning and control to increase productivity and contribute to keeping Germany economically competitive as a steel producer.”

Agent technologies that support the interoperability of business processes are being investigated at DFKI as part of Project ATHENA (Advanced Technologies for Interoperability of Heterogeneous Enterprise Networks and Applications). Here, the integration of agent technologies with service oriented and model driven architectures is the technological focus. The State Ministry of Education, Culture, and Science promotes the application of the ATHENA results to the steel industry under Project AgentSteel. Beyond this, Saarland’s Ministry of Economics and Labor is also planning further activities.

SmartFactory KL – Grand Opening of the Intelligent Factory of the Future

Secretary Englert praised the pioneer spirit of this technology initiative: “This economy needs innovations and impulses from science. The initiative brought to life by Professor Zühlke is an outstanding example of the joint development of new technologies by the user, the supplier and the researcher.”

Prof. Zühlke went on to explain the future developments planned on the premises of the new factory. “We develop and test the use of the so called ‘smarter technologies’, such as those already in use in the consumer goods sector, in an industrial environment – but only those that are at the threshold of practical deployment, for example, the use of real radio networks or intelligent micro-computers. We also examine the use of new hardware, such as the data glove, or RFID chips, or the eye tracker in the development and production processes at industrial plants.”

Additional information
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On October 18, 2006, as sponsor of VOICE Days and Chairman of the VOICE Awards Jury, Prof. Wahlster traveled to Bonn and the former German Parliament building to present the VOICE Awards in conjunction with VOICE Days 2006.

The competition for the “Oscar” of the speech technology branch included 72 voice controlled services based in Germany, Austria, and Switzerland. Of these, 42 systems qualified ... language with a computer, without the system needing any prior training to recognize the voice of the respective user.

The annual VOICE Awards, presented this year for the third time, recognized the voice portal 2006 for customer service from T-Mobile Deutschland as the best German language application. The “Best Technical Innovation” went to DHL Package Info and, the “Best Value Adding Service” was judged to be Golfscore from VoiceBusiness.

This year “Best VOICE Campaign” was added to the competition as a new category to highlight the best marketing campaign supported by a telephonic language application. It ... for developers, VOICEContest, was won this year, as in 2005, by Sympalog, however, this time in partnership with Avaya.

Earlier this year, on April 24, 2006, DFKI opened its innovative “Virtual Design Assistant” attraction at the Volkswagen’s theme park, Autostadt where virtual humans assist in solving a three dimensional “Auto Puzzle” and explain the latest technical innovations.

The installation provides visitors to the Autostadt with a very impressive, long lasting memory of their interactions with two photorealistic virtual characters. Using ten automotive parts at a scale of 1:5,5, and five different positions on the designer’s bench, the visitor can produce, with the expert guidance of Jara and Taron, over 800,000 variants of the y-0 puzzle, whereby 30 of these actually lead to a potentially successful model of a future vehicle.

“The complex combination of technologies represents a worldwide first in the field of Artificial Intelligence. The latest RFID technology for automated situational awareness and the real time animation of virtual humans with coordinated voice synthesis, combine with a situation-dependent dialogue designed for a “just for fun” transfer of knowledge regarding innovative automotive technologies. This interactive installation, which is controlled in parallel by three computers, creates a new dimension in “intelligent entertainment”. We are very proud of the fact we were able to use our state of the art research results in Artificial Intelligence as the basis to develop this innovative edu-tainment attraction for the Autostadt and today, inaugurate the operation as a key theme in the new Panorama of Knowledge,” explained DFKI Director, Prof. Wolfgang Wahlster.

Both characters are presented as life size projections and comment on the construction steps taken by the visitor. They provide the user with direct references in the construction of variant models. In addition to the design assistance, the virtual automotive experts discuss the latest research results, for example developments in driver assistance systems, hybrid engines, or alternative fuels. They also offer, on occasion, plans to increase accident prevention measures. Jara and Taron represent the Volkswagen Corporation’s Research and Development department in the Panorama of Knowledge.

The opportunities are fascinating when these virtual humans express themselves - through language and graphics software that seems to breathe life into them. Visitors get the impression that both presentation agents are watching them, understanding and answering them. As the declared experts, the support they give is dependent on the state of the design as they explain the research and technologies in automobile industry and motivate the user to continue.

DFKI partners in this project included: Charamel GmbH, for the design of the two virtual characters and their surroundings, as well as, the University of Augsburg (Department of multimedia concepts and applications) for the component that recognizes the approach and departure of a visitor.

The Idea Park was opened with a gala ceremony. The focus of this event was on the three main themes of the Idea Park: Mobility, Living and Environment, and Creativity. In talking with Günther Jauch, Prof. Wahlster explained the concepts and opportunities of AI. DFKI provided live demonstrations of the eight-legged and lan

An initiative of Thyssentknopp, the “Festival of Ideas” quickly became a highlight at the idea Park created at the Hannover Fairgrounds (20-28 May) under the theme: Discover Technology, Design the Future. Overall, more than 200,000 visitors came to appreciate the exhibits on display on the 30,000 sqm. showroom floor.
The “Selected Place 2006” in Germany on September 22 was DFKI, an honor achieved because of its history of successful innovation. As one of the “365 Selected Places” in the Federal President’s initiative “Germany - Land of Ideas”, DFKI was asked to present its current ideas and research results. The public was invited to visit DFKI and learn more about the ongoing work there, Klaus Bingel, representing the Deutsche Bank, one of the partners in the initiative, explained: “DFKI is an outstanding example of the richness of our country in the area of scientific innovation.”

Government officials in attendance included three state secretaries, Dr. Susanne Reichrath and Dr. Christian Ege of the Saarland and Secretary Dorothee Stosswinkel for Rheinland-Pfalz. Their presence underscored the importance with which this initiative is viewed by the host federal states.

DFKI presented innovative projects from each of its locations as part of the Open House at DFKI Saarbrücken. The day’s theme was “Rendezvous with computers” and included a large selection of systems and demonstrations. These included:

- **Verbmobil**, the first machine interpreter to take intonation into account and Smartform, the first system to simultaneously process the spoken language and expressions - imagine, for example, controlling your TV using this technology.

- **SmartWeb** lets you search the Internet with spoken queries - the system was demonstrated on a mobile computer but also installed in the Mercedes-Benz and A-Class cars. COMMAS 2008 will assist foreign visitors to get information and help with translation via their mobile devices at the Olympic Games 2008 in Beijing. DynaQ processes interactive queries for document-based, personal information rooms. MiPhone makes it possible to search for music in the Internet using semantic web technology to find the music you like simply by entering your favorite song title.

- The eight legged SCORPION walking robot is used to negotiate difficult terrain, which until now has been impassable for other robots. The robotic snake MEHEN swam in a large pool just outside the DFKI building while transmitting the images seen by its video-eye to a nearby monitor.

- **Virtual Humans** act as artificial quiz masters and others were soccer experts that assist in choosing a lineup for the German national soccer team. **Virtual Constructor** link the real and virtual worlds in a 3D auto puzzle and explain the latest technological innovations.

Numerous visitors and members of the media enjoyed the combination of short lectures and compact live-demonstrations that allowed them to learn about and personally experience many of the concepts in Human Machine Interaction.

Rounding out the day’s highlights at this “Selected Place 2006” was the official ceremony to honor Dr. Bernd Reuse, Head of Division at BMBF, and confer upon him the title of DFKI Fellow.

Minister Schreier made his comments in recognition of the services rendered by Dr. Reuse and their long term impact on the Saarland and, then as a highlight of the day’s events, awarded him the highest scientific honor - the title of Honorary Professor of the Saarland. “His influence demonstrates the forces and the dynamics that can develop when the power of innovative ideas, for political impuse, and management know-how in the research and scientific disciplines, combine to complement each other in a common purpose,” said Schreier.

“The efforts of Dr. Bernd Reuse have resulted in a German informatics landscape dotted with internationally renowned, competitive, and advanced research centers,” said Wahlster. “The new models of cooperation between business and research, such as DFKI, and numerous innovative breakthroughs, have not only contributed to the international reputation of German research, but more importantly, have also helped to create economic value, new companies, and high value, high tech jobs.”
The V-MIA initiative has set ambitious goals for itself: The initiative hopes to inspire a worldwide dialogue that focuses on the most important issues of our time and results in proposals of possible solutions.

At the “table of free voices” at the Bebelplatz in Berlin on September 9, 2006, 112 “alternative thinkers” met to answer 100 essential questions for the human race. Moderators at the event included Nobel Peace Prize laureate Nadir Ali, 2005 Nobel Peace Prize laureate Jody Williams, and civil rights activist Hafsat Abiola. Each of the 112 participants was given three minutes to answer each of the 100 questions. All 11200 statements were then recorded and stored as video and text in the “living library” at dropping-knowledge.org.

**SmartKom - the Book!**

**With contributions by leading scientists in the field, this book gives the first comprehensive overview of the results of this seminal project.**

Wolfgang Wahlster (Ed.)

SmartKom: Foundations of Multimodal Dialogue Systems

Publisher: Springer, Berlin, 2006

€ 80.20

ISBN 3-540-23732-1

**SmartKom is one of the most advanced multimodal dialogue systems worldwide and is a landmark project in the history of intelligent user interfaces.**

The system provides symmetric multimodality in a mixed-initiative dialogue system with an embodied conversational agent. The same software architecture and components are used in three fully operational application scenarios. The theoretical and practical foundations of SmartKom represent a new generation of multimodal dialogue systems that deal not only with simple modality integration and synchronization, but cover the full spectrum of multimodal dialogue.

The result of four years of intensive research in a large multimodal dialogue project involving 12 partners from academia and industry, SmartKom is one of the most advanced multimodal dialogue systems worldwide and is a landmark project in the history of intelligent user interfaces.

The exhibit attracted many high level visitors. Prof. Wahlster explained the system to Dr. Annette Schavan, German Minister of Education and Research. Also, Kapil Sibal, India’s Minister of Science and Saarland’s Economics Minister, Dr. Hampeger Georgi were there and were impressed with what they observed at the DFKI booth.

**DFKI Joint Venture V-MIA at Hannover Messe 2006**

DFKI introduced the V-MIA initiative to visitors at the Federal Ministry of Education and Research stand at the Hannover Messe 2006. The Lighthouse Project (Leuchtturmprojekt) is a scientific-technical cooperation between India, this year’s official national partner at the Hannover Messe, and Germany.

V-MIA is an application oriented language technology project with the goal of implementing a multi-lingual telephone dialog system. The project is a component of the Indian government’s roadmap strategy for the research intense field of multi-lingual, knowledge based language technology. Funding for the Indian project partners is provided by the Ministry of Science and Technology (DST) and the Ministry for Information Technology (DST) of India.

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**Prof. Wahlster presents Hermes Award at Hannover Messe 2006**

Scheduled as part of the opening festivities at the Hannover Messe (April 25-28, 2006), Prof. Wolfgang Wahlster presented the Technology Prize of the Deutsche Messe AG with a value of 100,000 euros, to „Hartling Mitronics.”

Present at the award presentation, also known within the sector as the “Innovation Oscar,” were German Federal Chancellor Dr. Angela Merkel, and India’s Prime Minister Dr. Manmohan Singh. High ranking guests also included Dr. Annette Schavan, Federal Minister of Education and Research and the minister-president of Lower Saxony, Christian Wulff.

The „Hermes Award” this year was presented for a revolutionary new RFID transponder, which uses 3-D antenna technology that allows the transponder to be employed for the first time ever in the vicinity of metals and liquids. The transponder has a range of more than five meters and comes with a casing well suited for industrial and extreme environments.

„Hartling’s passive transponder series, HARfids, represents a real breakthrough in that it paves the way for new fields of application under the topic of ambient intelligence”, said Prof. Wahlster in explaining the jury’s decision.

**dropping knowledge – Changing the World with Questions**

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**AN INNOVATIVE INTERNET PLATFORM FROM DFKI**

„In order to support the global dialogue to the widest extent while maintaining the necessary depth, we created a new kind of internet platform. The dialogue forum is linked to a knowledge base that “knows” cross connections and background data for thousands of topics,” explained Prof. Hans-Ulrich, director of language technology at DFKI and member of the supervisory board of dropping knowledge. „The semantic web technology continuously reorganizes the content: The ever current assessments and the number of retrievals by users let the system ‘learn’ the relevant importance of the individual content.”

The platform is a search engine and a library all in one: Users can either perform a full text search or gain access via an intuitive, optical navigation to conduct their research. Even natural language text queries will return results.

www.droppingknowledge.org
Dr. Ansgar Bernardi is the deputy director of the Knowledge Management department. He joined DFKI in 1990 starting out in the department of intelligent engineering systems, which later became part of the knowledge management area.

The focus of his work is on the development of decision support systems in the context of individual and corporate knowledge management.

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

The goal oriented handling of information in a quickly changing context by flexibly assembled teams will increasingly come to influence our working world and living conditions.

The work of our research department has the potential to give the people in this challenging environment the ability to be more creative and more effective.

DFKI employs a very employee-centric business model: the traditional, rather flat hierarchical structure is evident in the acquisition and performance of projects and promotes individual responsibility and employee flexibility.

What are the greatest challenges and opportunities for AI systems today?

We are on the verge of being able to or, rather having to, model and facilitate extremely complex scenarios and interactions. The challenge is to take the complexity required to produce useful results and make it easily manageable for the people who work with it.

What do you enjoy doing when you are not working as a research scientist?

I am married to a practicing veterinarian and have two very energetic young children. There is never a dull moment. Also, a percentage of my leisure time is devoted to singing in a choir.

What are your current projects?

I am responsible for NEPOMUK, a large EU project that deals with the topic of “Social Semantic Desktops”. In addition to that, I am frequently involved in joint ventures with industry.

What is the special position of DFKI within Private-Public-Partnerships? What makes it unique?

Mutual respect and a joint sense of responsibility will continue to form the basis of the unique DFKI culture and the new works council will continue to honor that philosophy”, said Stefan Winterstein, the new head of the works council.
News in brief

Order of Merit of the Federal Republic of Germany for Prof. Wahlscher
On August 28, 2006 Prof. Wolfgang Wahlscher received Germany’s prestigious Cross of Merit First Class (Bundesverdienstkreuz 1. Klasse), which was presented in the state chancellory in Saarbrücken by Saarland’s minister-president Peter Müller. Prof. Wahlscher was selected for the honor in recognition of his successful work in the development of artificial intelligence and the benefits to the Saarland University.

The Long Night of Informatics
DFKI participated in the first “Long Night of Informatics” organized and held in Saarbrücken. The historic courtyard of the Stadtgalerie served as the backdrop for the introduction of a variety of interesting research results and prototypes. DFKI presented Project Zams – 40 Million Coaches, as well as, COMPASS2008 – Comprehensive Public Information Services system for the Olympic Games 2008 in Beijing to curious onlookers.

CeBIT 2006 – Steamtalks: 60 Minutes Future
DFKI brought together the movers and shakers as well as the critics of national image campaign “Du bist Deutschland” (You are Germany). Lars Corfs (Fischer-Appelt Communication and press officer, “Du bist Deutschland”), Johnny Haeusler (Dowow Director, Speckblick Verlag), and Stefan Kuether (press spokesman, Google Deutschland) discussed the controversial topic “Du bist Blogging”. The panel was moderated by Reinhard Karger, Head of DFKI Corporate Communications.

Diplomats and Statesmen visit DFKI
Again this year, DFKI was honored to welcome many high ranking visitors from foreign governments. Included among our guests were: ambassadors from Canada, Italy, Denmark, and the Philippines, as well as, the deputy minister-president of Korea. They were able to gather information about the current state of research during their visit to the German Demonstration Center for Speech and Language Technology.

Kiyoshi Sakai visits DFKI
August 28, 2006 DFKI Kaiserslautern welcomed Kiyoshi Sakai, Member of the Board and CTO of RIKEN Ltd. Ms. Sakai was provided with information about the current development of the “Virtual office of the future”. He was pleased with the results of the joint venture between RIKEN and DFKI. The return visit by an important member of the RIKEN top management provides a significant incentive to extend the excellent cooperation into the long term.

New competence center established: Human Centered Visualization
A new competence center has been established under the name, Human-Centered Visualization (HOV) and has the job of performing application oriented, research and development in the zone where information visualization, human machine interaction and artificial intelligence intersect. The research and development effort will concentrate on the following three topics: Information visualization, graphic interaction, and intelligent visual presentation. The head of the competence center is Prof. Achim Ebert.

DFKI at the IFA 2006 in Berlin
DFKI presented systems and prototypes at this year’s International Consumer Electronics Fair in Berlin (IFA - September 1-6, 2006) as part of the Technical Sciences Forum. The focus was on the language technologies for the Olympic Games in Beijing 2008 – COMPASS 2008, and the system called TaxiNavigator, an intelligent and to knowledge based work process. Sharing the DFKI stand were drooping knowledge and ROMHE2B with a mixed reality interface.

German Research Center for Artificial Intelligence
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