Annual Report for Academic Year 2011 – 2012

Informatik 5
Information Systems

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- **Technical Staff:**
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- **Student Researchers:**

- **Cooperation Partners:**
Overview

Today, the field of Information Systems includes not just structured databases, but at least equally important the semi-structured and unstructured data in the World Wide Web. The Chair Informatik 5 addresses both domains, with the management of so-called metadata (data about data) in the kernel of its research interests. Current major themes include mobile web services and applications including logistics applications, metadata model management, and technology enhanced learning.

In the academic year 2011-2012, the group’s third-party funding again reached close to 3 m€. Large newly acquired projects include the eConnect project by the German Ministry of Economy (BMWi) in which six RWTH research groups collaborate with a consortium of regional energy providers on the ICT infrastructure for smart grids in eMobility. The German Federal Government named eConnect its “lighthouse project in ICT for electromobility”. At the end of the reporting period, a new EU Integrated Project LAYERS in technology-enhanced learning was also approved with a large participation by our group

Members of i5 again took leading roles in the organization and program chairing of international conferences. Yiweh Cao and Ralf Klamma were program co-chairs at ICWL 2011 and ICWL 2012, Milos Kravcik organized the JTEL Summer School, Matthias Jarke a Dagstuhl Seminar on Requirements Management, and several team members led workshops at important national and international conferences. As in the previous year, Dr. Krempels co-organized the 2012 Informatics Summer party, and Dr. Quix the Computer Science-internal championship InfoCup. Another highly visible internal events organized by i5 was the celebration of the 40th Anniversary of Computer Science studies at RWTH Aachen, combined with the award of an honorary doctoral degree to our long-standing cooperation partner Joh Mylopoulos (University of Trento). Last not least, the Informatics department held a colloquium in honor of the 60th birthday of Prof. Matthias Jarke. All in all, a truly party-intensive year!

The personnel at Informatik 5 remains highly international, representing almost 20 different nationalities. Doctoral theses were successfully defended by Yiweh Cao, Jessica Huster, and Xiang Li, the latter with distinction. Our HumTec postdoc Dr. Suki Grandhi accepted a tenure-track assistant professorship in Connecticut, USA. Congratulations are also due to Michael Derntl and Milos Kravcik who received best paper awards at two international eLearning conferences within a couple of weeks. On the occasion of his birthday, Prof. Jarke received the Fraunhofer Medal in recognition of his outstanding services to the Fraunhofer Society of Applied Research which also re-elected him for a second period as Chairman of the Fraunhofer ICT group (Europe’s largest applied research organization in IT) and member of the Fraunhofer Presidential Board. Moreover, he was appointed as one of the two new Fellows of the GI German Informatics Society elected in 2012, and elected as member of acatech, the German National Academy of Science and Engineering.
Research Projects

Research projects at Informatik 5 are organized according to the groups of mobile applications and services, technology enhanced learning and communities, model and data management. Much of our work is linked to the Excellence Cluster “Ultra High-Speed Mobile Information and Communication (UMIC)” under the German Excellence Initiative. More than 20 institutions at RWTH Aachen participate in UMIC, aiming at interdisciplinary design of ultra high-speed mobile information and communication systems. Informatik 5 works closely together with many institutes of electrical engineering, mechanical engineering, architecture, and computer science in two subprojects in the research area of “Mobile Applications and Services”.

Model Management and Data Integration Research

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<th>Mobile and Wearable P2P Information Management in Health Net Applications</th>
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Informatik 5 cooperates with the institute for textile technology (ITA), the Philips Chair for Medical Information Technology (MedIT), Informatik 9 (Data Management and Exploration) and the UMIC research group IT Security. The aim is to develop a P2P network in which patients, doctors, nursing staff, and emergency services have full access to information and services in their mobile work environment. Data about the health status of a patient is collected by a network of sensors integrated in the textile clothes. The data can be reviewed by doctors to consult the patients online, or by the emergency service to improve the diagnosis in an emergency situation.

After a first successful demonstration of the prototype at the Lousberglauf 2011, the team continued the development of the prototype, focusing especially on the quality of the collected data. Several studies have been performed to improve the quality of the ECG signal which is measured by several textile-integrated sensors. The sensor data is sent to a mobile device and can be shared in a peer-to-peer network. Thereby, remote monitoring of the state of runners and more complex data analysis on backend servers is enabled. The work of Informatik 5 focuses on mobile data integration, exchange and visualization. The software has been developed on the Android platform.

Furthermore, Informatik 5 organized the International Workshop on Information Management in Mobile Applications (IMMoA) at the International Conference on Very Large Databases (VLDB) in Istanbul, Turkey. Daniela Nicklas from the University of Oldenburg gave an inspiring keynote talk on context modelling and its integration into mobile applications.
The Cooperative Cars (CoCar) project, supported by the German Federal Ministry for Research and Education and Ericsson EuroLabs, tested the suitability of UMTS technologies and their foreseeable extensions (such as LTE) for direct, targeted transmission of traffic data arising from both stationary and vehicle-based sensors. The CoCar project was a part of the research initiative Adaptive and Cooperative Technologies for the Intelligent Traffic (aktiv) led by the German automotive industry. Several partners from telecommunications and automobile industry identified which traffic management and driver assistance applications are suitable for use of this technology.

Informatik 5 cooperated with Ericsson in Aachen and Fraunhofer FIT and develops data models, algorithms and systems for the data processing of CoCar applications. The main focus was on investigating data stream management systems as the core component for data processing in traffic information systems to realize multiple traffic applications. Furthermore, the group studies data (stream) mining algorithms for traffic applications. In 2012, the data stream-based evaluation framework has been extended by a data quality component which enables a continuous monitoring of multiple data quality measures during data processing. This allows not only to produce new traffic information such as queue-end warnings, but also to add a reliability value for this information. Furthermore, countermeasures can be activated if the data quality drops below a certain threshold. For example, if there is not a sufficient number of CoCars to produce reliable traffic messages, additional sources, such as floating phone data or road-side units can be taken into account.

ConceptBase is a multi-user deductive object manager mainly intended for conceptual modelling, metadata management and model management. The system implements the knowledge representation language Telos which amalgamates properties of deductive and object-oriented languages. Since summer 2009, ConceptBase is available as an open-source system under FreeBSD license on SourceForge. In 2011/12, the group focused on continuous improvement of the system and removed several bugs.
Model Management

M. Jarke, C. Quix, S. Geisler, F. Kastrati, X. Li, D. Yankov

Research in model management focuses on the formal definition of structures and operators for the management of complex data models to support applications dealing with the integration, maintenance, and evolution of data models. Based on the generic role-based meta model GeRoMe, the group developed the generic model management GeRoMeSuite which includes support for model management operations such as schema matching, composition of mappings, schema integration, and model transformation.

In 2012, the group worked especially on information extraction methods to extract structured data from unstructured documents. This work is done in the context of the dataspace framework which aims at integrating heterogeneous disparate sources that do not necessarily confirm to a specific schema. In order to tackle the complexity that arises when managing heterogeneous sources, the group has developed a novel search method by extracting semantic associations among entities contained in a dataspace, this way enabling a semantic search over heterogeneous sources. The system is domain independent, and utilizes an open-source knowledge base for extracting semantic classes for the extracted entities. The goal is to provide relaxed search services, enabling users to fulfill their information need even in scenarios when they have little or no knowledge about the underlying sources.

Mobile Community Information Systems Research and Development

B-IT Research School: Mobile to Mobile (M2M) multimedia service provisioning in future mobile networks

M. Jarke, A. C. Muzzamil

Multimedia applications are bandwidth-hungry whereas mobile networks are bandwidth-constrained. Enabling high quality multimedia services over mobile networks is not straightforward, has always been a great concern in this scenario. This dissertation project investigates a fundamental platform for Mobile-to-Mobile (M2M) service networks, where each subscriber device serves high quality multimedia services to other devices on the network with guaranteed Quality of Service (QoS). The proposed mobile platform is envisaged to host future M2M services for the future IP networks, such as the IP Multimedia Subsystem (IMS), which is now seen as an application/service layer in the Long Term Evolution (LTE) and 4G cellular networks.

In 2012, along with multiple architectural enhancements, the mobile platform has been extensively tested with the state-of-the-art Ericsson IMS and Fraunhofer OpenIMS testbeds. Thus, the existing platform is now been able to host and serve multiple M2M multimedia services over the future LTE-Evolved Packet System (EPS).
Within econnect Germany specialized R&D groups are developing applications for sustainable mobility based on electric energy. The objectives of the project are approaches for: smart grids for renewable energy, mobility concepts for urban areas, smart parking for vehicle to grid scenarios, information systems for public transportations, and finally, smart charging for electric vehicles. Informatik 5 coordinates the project activities of the seven participating institutes of RWTH Aachen University. In four scientific workshops with academic and industrial participants, we focused on knowledge acquisition, requirements engineering, and conceptual modelling for mobility concepts in urban and rural areas. In the development process for a new mobility concept for the City of Osnabrück the current public transport situation was analyzed and the city master plan was consulted to detect actual conceptual drawbacks and system operation bottlenecks. Furthermore, near and medium term objectives for urban mobility were defined to improve the public transport infrastructure and mobility efficiency supported by electric vehicles. As the new mobility concept for the City of Osnabrück is based on a higher integration of mobile transport systems, e.g. trains, busses, shared e-bikes, shared e-cars, and redesigned mobility points, e.g. integrated bus, e-bike and e-car station, there is high need to reduce the usage complexity of the new public transportation system. Therefore, representative mobility scenarios were used for use case deduction, requirements analysis for planning and navigation in the new system, and finally, the technical specification of an intuitive smartphone application supporting the user in pre- and on-trip planning and navigation. econnect Germany was awarded as a lighthouse project for electric mobility by the German Federal Ministry of Economics and Technology.
Virtual Campfire aims to provide professional communities such as researchers’ communities for cultural heritage management an advanced framework to create, search, and share multimedia artifacts with context awareness easily and fast. Virtual Campfire has established a research framework for mobile multimedia management with metadata standards and hybrid tagging approaches, cloud computing for mobile multimedia processing and mobile communities, convergence research on mobile and Web 2.0, social network analysis for mobile communities, and prototyping of complex community information systems.

In 2012, Virtual Campfire has been further developed by: 1) a framework and infrastructure for mobile cloud computing, 2) distributed user interfaces on different mobile devices, and 3) social network analysis methods for mobile community exploration. Within the context of this project, Yiweh Cao completed and successfully defended her dissertation.

Cloud computing envisions the notion of delivering software services and customizable hardware configurations to public access, similar how public utilities (electricity, water, etc.) are available to the common man. The cloud abstracts infrastructure complexities of servers, applications, data, and heterogeneous platforms, enabling users to plug-in at anytime from anywhere and utilizes storage and computing services as needed at the moment. The goal of our mobile multimedia cloud (i5Cloud) is to provide infrastructure as a service (IaaS) and platform as a service (PaaS) for diverse services and applications in the domain of (mobile) multimedia and large-scale social network analysis.
A dissertation project by D. Kovachev investigates possibilities to augment the capabilities of weak mobile devices and develop middleware that can seamlessly offload the computing and storage of mobile applications into the cloud. Cloud computing technologies have been emerging recently as a solution to scalable on-demand computing storage resources that can be accessed via the Internet. The never ending strive for increasing mobile processing power and more data, clouds can be the best possible solution to augment the mobile execution platform. Furthermore, due to changing conditions in the mobile environments, context-awareness can play crucial role in delivering mobile services with best performance. This work is supported in part by the B-IT Research School.

**BIT Research School: Community-centered Semantics for the Detection of Faked Multimedia**

*M. Jarke, R. Klamma, K.A.N. Rashed, H. Kosch (U. Passau)*

The dissertation project by Khaled Rashed investigates the possibility of combining the power of Web 2.0 techniques and community approaches with capabilities of content-based similarity search and retrieval with the to facilitate fake multimedia detection by means of providing semantics for faked multimedia search and retrieval. To realize these objectives, a study of the social aspect by means of trust built-up over time is coupled to concepts such as incentives engineering and collective intelligence to facilitate fake detection. Gaming with a purpose is used to overcome the cold-start problem. A trust-aware media quality profile is proposed to provide helpful metadata for classifying the media. The combination of content based multimedia and social interaction (trust, rates, and multimedia reputation) can be used as service to provide metadata able to infer semantics of multimedia in term of forgery. During the year 2012, an algorithm called MHITS to rank users’ expertise in online web-based collaborative fake media detection systems has been developed. We integrate SumUp, a Sybil-resilient algorithm; into MHITS algorithm as a robust ranking strategy. This work is supported in part by the B-IT Research School.

**Research in Technology-Enhanced Learning**

**EU Network of Excellence GALA: Games and Learning Alliance**

*M. Jarke, R. Klamma, M. Derntl, M. Kravcik, A. Hannemann*

GaLA gathers the cutting-the-edge European Research & Development organizations on Serious Games, involving 31 partners from 14 countries. Partnership involves universities, research centers, and developer and education industries. The GaLA motivation stems from the acknowledgment of the potentiality of Serious Games (SGs) for education and training and the need to address the challenges of the main stakeholders of the SGs European landscape (users, researchers, developers/industry, educators). GALA aims to shape the scientific community and build a European Virtual Research Centre aimed at gathering, integrating, harmonizing and coordinating research on SGs and disseminating knowledge, best practices and tools as a reference point at an international level. The other key focuses of the project are: the support to deployment in the actual educational and training settings; the fostering of innovation and knowledge transfer through research-business dialogue; the development high-quality didactics on SG by promoting and supporting courses at Master and PhD level.

During the second year of the project, i5 had four major work items. First, the collaboration in the Technical Committees and Special Interest Groups carried fruits, and findings were submitted and published at different conferences (e.g. AIIDE 2012, VS-GAMES 2012) and
journals in collaboration with consortium partners. Second, results of the 2nd GaLA Alignment School in Carcavelos, Portugal, workshop track on “Interactive Storytelling” will be used as input to GaLA’s new Serious Games MSc curriculum. Third, in collaboration with GaLA partner Cyntelix we co-chaired a highly successful workshop on “Pedagogically Driven Serious Games” (PDSG 2012) at the 7th European Conference on Technology Enhanced Learning (EC-TEL 2012) in Saarbrücken, Germany. Fourth, we made “Serious Games” the main theme of our High-tech Entrepreneurship and New Media lab for computer science master students in winter term 2011/12 at RWTH Aachen University. In this lab course our GaLA partner Cyntelix co-supervised one student team in a Serious Game development project.

EU Support Action TEL-MAP: Future gazing Technology Enhanced Learning - The Roadmap for the unknown Learning Landscape
M. Jarke, R. Klamma, M. Derntl, M. Kravcik, S. Erdtmann, K. Hoxha, L. Dohmen, R. Uppal, A. Peash

With a 10-year horizon, TEL-MAP co-develop a portfolio of stakeholder-specific roadmaps and influence maps, to gain insights into fundamentally new forms of Learning, Education and Training activities (LET) and into what makes for effective transfer and scalability. Outcomes include well-grounded recommendations on TEL and LET innovations, plus a platform and a sustainable dynamic process that will foster collaboration and consensus-building across specialized communities and stakeholder groups.

In the second year of the project (October 2011 – September 2012) i5 produced several key contributions to the project:

- We conceived, developed, deployed, and evaluated an embeddable dashboard on http://learningfrontiers.eu for supporting roadmapping activities by different stakeholders (e.g. policy makers, observers, authors) by providing flexible and personalized visualizations of data indexed in our Mediabase.
- We extended i5’s AERCS system with a conference and journal series analysis tool, as well as a series comparison tool. These tools enable stakeholders to view, analyze, compare, and benchmark the development and status of conference and journal author communities based on social network measures.
- All Mediabase data sources were significantly extended with new data from blogs, EU funded projects, and papers. We published several papers at international conferences and journals on results of social network analyses in these data sources. Also, we automatically extract and publish a daily digest of “hot blog posts” from the TEL blogosphere indexed in the Mediabase.

LD-Grid: Learning Design Grid
M. Derntl

Learning Design Grid (LD-Grid) is a team of individual researchers from all over Europe, whose work is funded by the EU Network of Excellence STELLAR. LD-Grid aims to produce a concise, comprehensive and accessible set of resources which will empower educators and learners to participate in design discourse and practices in technology enhanced learning (TEL). These resources will enable learners and educators to collaboratively reflect on their goals and constraints, characterise contexts of learning, and devise viable means of achieving their goals within these contexts and in light of the constraints.
The project was successfully completed in May 2012. The main outcomes are:

- A comprehensive mapping of representations of design knowledge in TEL and reviews of existing banks of learning design resources and tools, [http://ld-grid.org](http://ld-grid.org)
- Several workshops including Art and Science of Learning Design (ASLD 2011), Theory and Practice of Learning Design at Online Educa 2011 (TPDL 2011) and at Designs for Learning Conference (TPDL 2012), and a workshop to be held at the 2013 Alpine Rendezvous called “Teacher-led Inquiry and Learning Design: The Virtuous Circle”. In addition, several papers were published.
- A follow-up project called METIS, in which i5 is a consortium member, and which is funded by the European Commission in the Lifelong Learning Programme. METIS will commence in November 2012 and will last for 28 months.

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**EU Life Long Learning Program TeLLNet: Teachers' Lifelong Learning Networks**

*M. Jarke, R. Klamma, Y. Cao, M. C. Pham, R. Vuorikari (European Schoolnet), A. Sahib*

The EU Life Long Learning Project TeLLNet supports the development of European Schoolnet (www.etwinning.net) in cooperation with the European Schoolnet, Open University of the Netherlands, and Institute for Prospective Technological Studies (IPTS) as one of European Commission Joint Research Centers. Social Network Analysis (SNA) helps the project investigate patterns of teacher communication, cooperation, and other kinds of interaction taking place in business, organizations and the World Wide Web.

In 2012, we finished the dynamic analysis of eTwinning communication, to identify social roles in the learning network on the member level, on the sub-network structures, and on the network level. A dynamic data flow automatically triggers the re-computation of roles and structures over time, based on the previously established data warehouse. Time series analyses observe the evolution of the teachers’ professional development. We have proposed a model to analyze the development of eTwinning community based on different kinds of interaction between eTwinners (teachers). We focus on two problems. Concerning the development of eTwinning, we analyze the development patterns of the community. To assess social capital in eTwinning, we measure both individual and group social capital. The results are useful for policy-makers, members and central support service of the eTwinning network, 35 National Support Services and the eTwinning Steering Committee, to understand the underlying mechanisms for the transfer of good practices and innovation.

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**EU Integrating Project ROLE: Responsive Open Learning Environments**

*M. Jarke, R. Klamma, M. Kravcik, Z. Petrushyna, D. Renzel, A. Hannemann, A. Guth, P. De Lange*

ROLE is an EU-funded large-scale integrated project in the domain of technology enhanced learning (TEL). ROLE aims at delivering and testing prototypes of highly responsive TEL environments, offering breakthrough levels of effectiveness, flexibility, user-control and mass-individualization, thereby advancing the state-of-the-art in human resource management, self-regulated and social learning, psycho-pedagogical theories of adaptive education and educational psychology, service composition and orchestration, and finally the use of ICT in lifelong learning. ROLE offers adaptivity and personalization in terms of content respectively navigation and the entire learning environment and its functionalities.
This approach permits individualization of the components, tools, and functionalities of a learning environment, and their adjustment or replacement by existing web-based software tools. Learning environment elements can be combined to generate (or mash-up) new components and functionalities, adapted by collaborating learners to enhance the effectiveness of their learning. As vice coordinator, i5 is technical leader and community facilitator.

We coordinated development, hosted and maintained the project development infrastructure, released four versions of the ROLE Software Development Kit, and are hosting the ROLE Sandbox. Building on earlier results and ongoing efforts we further elaborated the idea of Social Requirements Engineering and the ROLE Requirements Bazaar, resulting in a prototypical implementation and a further publication at EC-TEL 2012. Another focus was on real-time communication and collaboration in widget-based Web applications using the XMPP protocol, in particular Inter-widget Communication. We actively contribute to several well-known Open Source projects and standardization bodies such as strophe.js, Apache Rave and the XMPP Community. We also co-organized two workshops at the ICALT and UMAP conferences, on investigation of self-regulated learning (S-ROLE) and personalization approaches in learning environments (PALE). Our achievements have been presented at the most relevant e-learning conferences like ICALT, EC-TEL, and ICWL, where our contribution received the Best Paper Award.

DFG CONTiti: Context Adaptive Interaction in Cooperative Knowledge Processes

M. Jarke, R. Klamma, A. Hannemann, C. Terwelp, M. Hackstein

The aim of this DFG-funded cluster project of four NRW universities was to design context adaptive systems for knowledge processes. The Informatik 5 subproject “Traceable Cooperative Requirements Engineering for Communities-of-practice” extended earlier context, process or cooperation models by comprehensible evolution histories, thus leading towards a cycle of comprehensible information collection, processing and employment for learning and re-engineering. A model for community-oriented requirements engineering, developed within CONTiti, was applied and verified in three large-scale open-source projects of bioinformatics (“Soziale Interaktion in Open-Source-Communitys”, Praxis der Wirtschaftsinformatik).

Life Science Informatics

SEKT - Spezifische Detektion von einzelnen Keimen in Rein- und Trinkwasser

T. Berlage, J. Bornemeier

SEKT was newly established in 2012. The overall goal of the project is to detect bacteria in drinking water by filtering the water and microscopically analyzing the filter surface for a small number of bacteria. The intention of EADS as a partner is to use this technology in various security scenarios and in regular aircraft maintenance. Helmut Hund GmbH is responsible for the optical detection hardware.

The work of RWTH is focused on image analysis, the recognition and discrimination of bacteria, which are labeled with fluorescent antibodies. We will develop a suitable strategy for scanning the filter surface, including content-based autofocus. We will work on different methods for the recognition of suitable objects and for discrimination between bacteria and other material. We will support the validation of the technology by performing analysis on both sparse and high filter loads, on both synthetic as well as real-world samples.
Transporter protein topology influences numerous cellular processes. Internalisation of transporter proteins into the cells or their directed placement into the cellular membrane regulates flow of substances and, if altered, causes diseases. As a part of the Clinical Research Group 217 "Hepatobiliary Transport and Liver Diseases (Speaker: Prof. Dr. D. Häussinger, University Düsseldorf) a workflow for an automatic data analysis was developed. The new methods was compared to manual analysis in various experiments and the robustness of the method could be established. A new and more general approach does not need structural recognition of the membranes, which often is a specialized image analysis procedure. Instead, probabilistic sampling of the toponomic area combined with an improved selection strategy allows us to tackle more general tissue structures. The new approach was validated to be substantially equivalent to the previous, more specific methods.

The results were presented to a high-level board of reviewers. As a result, a second project period was granted. In this period we will focus on tissue-level structures to ensure that the fields-of-view analyzed from a large slide can be automatically selected via image analysis. This will provide a less biased and more automated analysis of whole slides.

Virtual Microscopy in Geoscience

T. Berlage, J. Bornemeier

In collaboration with Fraunhofer FIT, an automated scanning microscope has been developed that is able to scan thin sections of rock automatically in multiple polarization angles. The purpose of the project is to develop a new method to represent these data sets in a more space-efficient manner. For this purpose, changes of a pixel over polarization angles are fitted with a cosine function if possible, as this is what pure crystals embedded in the rock will show. This representation will be suitable both for virtual microscopy (reduced bandwidth) and image processing (natural distinction of differently oriented crystals in contrast to non-polarizing material). The software will be tested in a teaching environment. For this purpose, an interdisciplinary ETS grant with the geo-sciences has been approved.

Other Research Projects

HumTec Project “Natural Media and Engineering”

M. Jarke, V. Evola, S. Grandhi, I. Mittelberg (HumTec)

This interdisciplinary project between linguistics (Prof. Jäger), informatics (Prof. Jarke), psychology (Prof. Koch, Prof. Willmes, Prof. Huber) and psychiatry (Prof. Schneider, Prof. Mathiak) is funded within the Human Technology (HumTec) initiative of the Future Concept RWTH-2020. A team of three international Junior Professors and Postdocs has been formed under the direction of Prof. Irene Mittelberg; the main research attention is directed to the analysis of gestures in conjunction with other “natural media” of the human. The intended long-term impact is improved human-machine interaction design based on a deeper understanding of natural media. Dr. Sukeshini Grandhi represented information systems in this project, publishing papers on experiments in the HumTec-i5 Gesture lab in the prestigious DIS and CHI conferences, before accepting a tenure-track professorship in the US.
In the reporting period, the Natural Media project was showcased and reviewed several times within the context of the big re-evaluation of the RWTH-2020 future concept in summer 2012. In all of these reviews, it came out as one of the scientific highlights of the first funding phase in the excellence initiative; as a consequence, it is one of only three HumTec projects that are continuing into the second phase. In addition, RWTH Aachen University is setting up a new SignDes lab, focussing on sign languages and support for the Deaf, also supported by the excellence initiative. Informatik 5 is on the Advisory Board, and (via Fraunhofer FIT) an important project partner for this nationally unique new research center.

**Forum Informatik: Deployment of a Multi-Agent Simulation Platform for Interdisciplinary Research and Teaching**

*M. Jarke, R. Klamma, M. Brettel (WIN), T. Kron (Institut für Soziologie)*

Following up the successfully finished OBIP project we are creating a virtual center for multi-agent simulation together with colleagues from the institutes of engineering and sociology. Goal of the project is the creation and dissemination of knowledge about the multi-agent simulation system Repast within the wider RWTH Aachen University research and teaching community. For this purpose, we are setting up a repository of already existing models and a documentation wiki for the communication of modelling, implementation, and teaching knowledge. In 2012 we also performed a workshop with the help of the ZLW. In the workshop we explored new teaching methods and disseminated first results of the project. Within the workshop two interdisciplinary theses were finished. A master thesis dealt with the multi-agent simulation of entrepreneurial decision making processes (causal vs. effectual) based on different network topologies of the entrepreneurial networks. A bachelor thesis was simulating the effects of ethno-nationalist conflicts in the Balkan wars in the 90s.

**BMBF Project SurgeryTube: Web 2.0 technologies in the training of surgeons**

*W. Prinz, N. Jeners, S. Franken*

SurgeryNet offers an innovative Web 2.0 training platform surgeons, with a key focus on minimally invasive surgery. The central idea is the combination of daily work processes and the collection of learning content, through a time- and location-independent provision of the latest know-how. SurgeryNet simplifies the creation of case-related online content into the daily work processes and enables the users to share current knowledge.

The online content in terms of videos, 3D-models, pictures, and slideshows can be stored by all users to document their own work, or to serve education and training of surgeons. Thus, the problem of increasing time pressure in the operating room can be mitigated by the training of surgeons with the content of SurgeryNet. Users can comment and discuss the existing content to ask questions and bring in their knowledge.

The popular BSCW platform is utilized to build the basis of the SurgeryNet platform. BSCW provides general purpose document management functions with an HTML interface. During the project, a new interface and new functions will be developed and integrated in the BSCW to create the SurgeryNet platform. SurgeryNet will provide functions of a social community, like a profile and communication features and also picture and video sharing functions.
Since 1995, Informatik 5 is active in the field of internet-based community support, both in terms of research on community and web service tools and in terms of providing infrastructures for scientific communities worldwide. For example, Informatik 5 hosted the first website for the city of Aachen in 1995 and, since the same year, manages one of the most successful public-domain Internet servers in the German science net, SunSITE Central Europe. Supported by Sun Microsystems with powerful hardware and base software, SunSITE Central Europe focuses on scientific community support, including mirrors of some of the most important research literature indexes, workspaces for Internet cooperation, and about 3 TB of open source software. Typically, the SunSITE enjoys around 23 million ftp and http accesses per month.

Since September 2005, Informatik 5 is hosting the i* Wiki, a platform for researchers and users to foster investigation, collaboration, and evaluation in the context of the i* modeling language. In 2011, the wiki has been moved to the SunSITE serve for better services to the scientific community.

Other Activities

Service
Thomas Berlage served as a reviewer for the french Agence Nationale de Recherche for their excellence initiative "investissements d'avenir" in the 2011 Bioinformatics call.

Yiwei Cao is member of DIN NI-32 “Data Management and Data Exchange”.

Michael Derntl served as external reviewer for the “Veni” grants, Netherlands Organization for Scientific Research (NWO). He also served as reviewer for the Promotion Committee at School of Computing and Information Systems at Athabasca University, Canada. He was member of the Doctoral Consortium at the 7th European Conference on Technology Enhanced Learning (EC-TEL 2012). He also coordinates the thesis seminar series at i5.

Matthias Jarke’s major service activities in 2011-2012 included

- Deputy coordinator, UMIC Excellence Cluster on Mobile Information and Communication, RWTH Aachen University
- Executive Director, Fraunhofer FIT, Birlinghoven
- Chairman, Fraunhofer Information and Communication Technology group, and Member of Presidential Board, Fraunhofer Society
- Founding Director, Bonn-Aachen International Center for Information Technology (B-IT), and Speaker, B-IT Research School
- Inaugural Dean, Applied Information Technology, German University of Technology in Oman (GUtech)
- Scientific advisory board, Faculty of Informatics, University of Vienna, Austria
- Scientific advisory board, Learning Lab Lower Saxony (L3S), Hannover
- Chair, Scientific advisory board, OFFIS e.V., Oldenburg
• Advisory board, Large Scale Complex IT Systems Initiative (LSCITS), UK
• Hochschulrat, FH Köln
• Member of Program Board, LOEWE Excellence Initiative Hessia
• Member, CeBIT-Messeausschuss
• Member, Industrie 4.0 Working Group of BMBF and BMWi Germany
• Member, Working Group on Reference Data Set, Wissenschaftsrat Germany
• Jury, Wissenschaftspris Stifterverband der Deutschen Wirtschaft
• Chairman, ASiIN review group for University of Potsdam and Hasso-Plattner-Institute

Within the RWTH Future Concept “RWTH-2020”, Prof. Jarke was so-responsible for the activity “International Recruiting”.

Nils Jeners is member of the executive committee of the Fachgruppe CSCW (Computer-Supported Cooperative Work) der GI (Gesellschaft für Informatik).

Ralf Klamma is technical leader & community facilitator of the EU IP ROLE, senior researcher in the EU projects TELLNET, TELMAP, and the Network of Excellence in Serious Gaming. In WS 11/12 he held a guest professorship at Universidad Carlos III de Madrid, Spain. He founding member of the European Association on Technology Enhanced Learning (EATEL). He served as external reviewer for a PhD at UPM, Madrid, Spain.

Wolfgang Prinz is member of the executive committee of the Fachgruppe CSCW (Computer-Supported Cooperative Work) der GI (Gesellschaft für Informatik).

Wolfgang Prinz is Editor of i-com Zeitschrift für interaktive und kooperative Medien, Oldenbourg Verlag.

Wolfgang Prinz is Editor of the CSCW Journal, Springer.

Christoph Quix maintains the interactive map and database for erlebe-it.de, a project by BITKOM Association for Information Technology, Telecommunications and New Media.

Dominik Renzel continued to be manager of the /Wiki.

Thomas Rose acted as reviewer for funded EU projects on “ICT for Energy and Water Efficiency” for the European Commission after serving as evaluation expert for EU Project Proposals on "ICT for Energy and Water Efficiency in Public Housing” in 2010/11.

**Editorial Boards**

Michael Derntl served as an executive reviewer for the following journals: Educational Technology & Society. He also served as a peer reviewer for the IEEE Transactions on Learning Technologies, Educational Technology Research & Development, and the Journal of Research and Practice in Information Technology.

Sandra Geisler is a member of the editorial board of the International Journal of e-Healthcare Information Systems (IJe-HIS).

Ralf Klamma serves as associate editor for IEEE Transactions on Learning Technologies (TLT), Springer Journal on Social Network Analysis and Mining (SNAM), and IJTEL. He is section editor for the forthcoming Springer Encyclopaedia of Social Network Analysis and Mining (ESNAM) and editor for the IEEE Special Technical Committee on Social Networks (STCSN). In the moment he is editing special issues for IJTEL and for ComSIS Journal. He is editor-in-chief for the SunSITE CEUR and several community information systems like the PROLEARN Academy (www.prolearn-academy.org), the Multimedia Metadata Community (www.multimedia-metadata.info) and the Bamiyan Development Community (www.bamiyan-development.org). He also served as reviewer for World Wide Web Journal (WWWJ), IEEE Transactions on Learning Technologies (TLT), Multimedia Tools and Applications (MTAP), Journal of Networks and Applications (JNCA), Journal of Universal Computer Science (JUCS), Information Systems Frontiers (ISF), Künstliche Intelligenz (KI), Educational Technology & Society (IFETS), ACM Journal on Computers and Cultural Heritage (JOCCH), Journal of Computer Science and Technology (JCST), and International Journal on Cooperative Information Systems (IJCIS).


Zinayida Petrushyna becomes an editor of the special issue on “Learning Analytics” for the International Journal of Technology Enhanced Learning.

Christoph Quix served as a reviewer for Data & Knowledge Engineering, the Journal of Web Semantics, the Journal of Web Engineering, and the World Wide Web Journal.

Dominik Renzel continued to serve as reviewer for the International Journal on Multimedia Tools and Applications (MTAP).

Thomas Rose has been Programme Committee member of the workshop for "IT-support of rescue forces", GI conference 2012, Braunschweig and a Programme Committee member of the workshop for "Standard Operating Procedures for Health Care", GI conference 2012, Braunschweig.

**Conference Organization**

Yiwei Cao was panel co-chair of 11th International Conference on Web-based Learning (ICWL’12). She was program committee member of 8th International Workshop on MOBILE and NEtworking Technologies for social applications (MONET’12), COMPLEX’12, CONTENT’12, ICST’12, CTUW’12, DEXA’12, IMCIC’12, Mobile Learning’11 (ML’12), and IEEE Mobile Cloud 2013. Yiwei Cao was also reviewer for International Journal on Multimedia Tools and Applications (MTAP), CSCS Journal, Elsevier Journal of Pervasive and Mobile Computing (JPMC), Elsevier Journal of Systems and Software (JSS), ACM Intelligent Tutoring and Coaching Systems (TIST), and Elsevier Journal of Tourism Management (JTMA).

Michael Derntl was programme committee member of the following conferences: 7th European Conference on Technology Enhanced Learning (EC-TEL 2012), 12th IEEE International Conference on Advanced Learning Technologies (ICALT 2012), 4th IEEE International Conference on Technology for Education (T4E 2012), 4th International Conference on Games and Virtual Worlds for Serious Applications (VS-Games 2012), 11th
International Conference on Web-Based Learning (ICWL 2012), the Doctoral Consortium of EC-TEL 2012, and 20th International Conference on Computers in Education (ICCE 2012). He co-organized a workshop at the JTEL Summer School 2012.

Sandra Geisler and Christoph Quix organized the International Workshop on Information Management in Mobile Applications (IMMoA) at the International Conference on Very Large Databases (VLDB) in Istanbul, Turkey.

Matthias Jarke was co-organizer of the Dagstuhl Seminar “Requirements Management – New Challenges and Approaches”. He was also program committee member of the following conferences: SE 2012 (Berlin) and SE 2013 (Aachen), CAiSE 2012 (Gdansk), REFSQ 2012 (Essen), and ER 2012 (Florence)


Nils Jeners served on the program committee of the 1st International Workshop on Socially Intelligent Computing (SINCOM 2012) of the OnTheMove OTM Federated Conferences and Workshops.

International Workshop on Enabling Successful Self-Regulation in Open Learning Environments (S-ROLE’12), Workshop on Semantic Models for Adaptive Interactive Systems (SEMAIS’12), Workshop on Data Management in the Cloud (DMC’13).


Karl-Heinz Krempels was program chair of the 8th International Conference on Web-Information Systems and Technologies (WEBIST’12). He was program committee member of 7th International Joint Conference on Computational Intelligence (ECTA’12)

Zinayida Petrushyna was a program committee member of the 7th European Conference on Technology Enhanced Learning (EC-TEL 2012) and IADIS e-Learning 2012. She organized the Workshop “Presentation Skills” during the 8th Joint European Summer School on Technology Enhanced Learning (JTEL 12).

Wolfgang Prinz co-chaired the 1st International Workshop on Socially Intelligent Computing (SINCOM 2012) of the OnTheMove OTM Federated Conferences and Workshops. He is currently is Program chair of the 6th International Conference on Communities and Technologies 2013, Munich.

Christoph Quix was a member of the program committee of the 31st International Conference on Conceptual Modeling (ER 2012), of the 28th International Conference on Data Engineering (ICDE 2012), and of the 11th International Conference on Ontologies, DataBases, and Applications of Semantics (ODBASE 2012).

Dominik Renzel organized the Workshops "How to Build & Develop Responsive Open Learning Environments with the ROLE SDK" during the 8th Joint European Summer School on Technology Enhanced Learning (JTEL 12) and the Dev8eD 2012 conference. He also co-chaired the third ROLE Developer Camp 2011 in Leuven, Belgium.

Thomas Rose organized as workshop co-chair the workshop on "Standard Operating Procedures for Health Care", GI conference 2012, Braunschweig.

Christoph Terwelp served as a reviewer the 8th International Conference on Web-Information Systems and Technologies (WEBIST’12).

Software Demonstrations

ROLE Interwidget Communication. 3rd ROLE Developer Camp, November 29, 2011, Leuven, Belgium

ROLE Technologies – A possible contribution to Apache Rave? Apache Rave Meetup NL, June 13, 2012, Utrecht, NL.

YouTell, 2st GaLA Alignment School, Carcavelos, Portugal, June 25, 2012

Virtual Campfire, UMIC Day 2011, Aachen, Germany, October 19, 2011

**Talks and Publications**

**Talks**


Y. Cao: *Learning Analytics - Social Network Analysis for Learning Communities*. CELSTEC Learning Networks Seminar Series, Heerlen, the Netherlands, April 17, 2012.

Y. Cao: *Opening Speech*. ICWL 2011, Hong Kong, China, December 8, 2011.


M. Derntl: *An embeddable dashboard for widget-based visual analytics on scientific communities*. 12th International Conference on Knowledge Management and Knowledge Technologies (I-KNOW 2012), Graz, Austria, September 5, 2012


M. Jarke: *Opening Adress on Occasion of Starting New Fraunhofer FIT Project Group at University of Augsburg*. Augsburg 21.10.2011
M. Jarke: Research challenges in mobile information systems: cooperative, energy-efficient, secure? Keynote Lecture, 10th Anniversary of Computer Science at Free University Bolzano, Bolzano, Italy, 1.12.2011


M. Kravcik: Adaptive Mobile Micro-Learning Analytics. DFG Meeting, Darmstadt, Germany, June 11, 2012

M. Kravcik: ROLE Project. 2nd GaLA Alignment School, Carcavelos, Portugal, June 27, 2012


M. Kravcik: Supporting Self-Reflection in Personal Learning Environments Through User Feedback. 2nd International Workshop on Personalization Approaches in Learning Environments (PALE), held in conjunction with the 20th International Conference on User Modeling, Adaptation, and Personalization (UMAP2012), Montreal, Canada, July 17, 2012


M.C. Pham: Learning Analytics in a Teachers’ Social Network. Eighth International Conference on Networked Learning (NLC 2012), Maastricht, April 2-4, 2012


W. Prinz, Trends im Mobile Entertainment, ECO Mobile Games Conference, 7.12.11, Cologne

W. Prinz, Soziale Medien und ihre Wirkung auf den Arbeitsplatz von morgen. Keynote, CISCO CIO Roundtable, 22.3.12, Hannover

W. Prinz, Zukunft der Arbeit: Social Media im Unternehmen, eLearning Conference Tour 2012, 2.5.12, Cologne

W. Prinz, Grundprinzipien von Social Media und ihre Rolle in der internen Unternehmenskooperation, Riffelalper Managementtage, 29.8.2012, Zermatt


W. Prinz, Next Generation Workplace Media, Wirtschaftswoche Konferenz, Enterprise Collaboration & Communication, 26.11.12, Frankfurt


Publications

Books and Edited Volumes


Yiwei Cao: Uncertainty Handling in Mobile Community Information Systems, Dissertation, RWTH Aachen University, 2012

Jessica Huster: Prozessanalyse und Ontologieevolution in kreativen, dynamischen Domänen. Dissertation, RWTH Aachen University 2012 (Shaker-Verlag, Informatik Series)

Journal Articles

Buchholz, Hagen; Prinz, Wolfgang: Der Digitale Untersetzer – Änderung des Trinkverhaltens durch Reflexion, i-com Zeitschrift für interaktive und kooperative Medien, Themenschwerpunkt Persuasive Technologies, 2, 2012


Wolfgang Prinz, Sabine Kolvenbach: From Groupware to Social Media – Extending an Existing Shared Workplace System with Social Media Features, it – Information Technology, 5, 2013, 228-234


Conference, Book Contributions, Patents


Roland Klemke, Milos Kravcik: Open 3D Environments for Competitive and Collaborative Educational Games. Proceedings of the 1st International Workshop on Pedagogically-driven Serious Games (PDSG 2012) in conjunction with the Seventh European Conference on Technology Enhanced Learning (EC-TEL 2012), Saarbrücken (Germany), September 2012


Manh Cuong Pham, Michael Derntl, Yiwei Cao, Ralf Klamma: Learning Analytics for Learning Blogospheres. E. Popescu et al. (Eds.): ICWL 2012, Springer LNCS 7558, 255–264


Technical Reports


Sten Govaerts, Felix Mödritscher, Hans-Christian Schmitz (eds.), Erik Issakson, Freddy Limpens, Matthias Palmér, Dominik Renzel, José Luis Santos, Kerstin Schmidt: Testing and conformance recommendations and tools that support integration and development of new services. ROLE Deliverable D3.5/2.5, January 2012.


Manh Cuong Pham, Yiwei Cao, Ralf Klamma: Social Network Analysis Methods for Lifelong Learning Communities. TELLNET Deliverable D2.2, May 2012.

Awards

M. Derntl: Best full paper award at the 12th IEEE International Conference on Advanced Learning Technologies (ICALT 2012) for the paper “Interactions for Learning as Expressed in an IMS LD Runtime Environment” (external co-authors: S. Neumann, P. Oberhuemer)

M. Kravcik: Best paper award at the 11th International Conference on Web-based Learning (ICWL 2012) for the paper “A Mashup Recommender for Creating Personal Learning Environments” (external co-authors: A. Nussbaumer, M. Berthold, D. Dahrendorf, H.-Ch. Schmitz, D. Albert)
Dissertations at Informatik 5

Yiwei Cao

Title: Uncertainty Handling in Mobile Community Information Systems
Examiners: Matthias Jarke, Baltasar Fernandez-Manjon, Ralf Klamma
Date: 22. March, 2012

Abstract: Current mobile community information systems handle vast amounts of multimedia, various operations on multimedia processing, and diverse user communities using different mobile devices. Imprecise or even false GPS information, users' false semantic description about a multimedia artifact, or different interpretations of multimedia content in different user communities lead to data uncertainty. Some research work has been conducted in advanced uncertainty databases with probabilistic theories, data lineage, and fuzzy logic. However, these approaches deal with “conventional” data uncertainty problems at the database level. Multimedia content as well as user and community factors are not paid much attention, which is important for data management in prevalent web and mobile community information systems. Hence, this dissertation deals with data uncertainty problems addressed with the emerging and advanced development of Web 2.0 and mobile technologies. In my research I identify the new uncertainty problem perspectives in context, multimedia semantics, and community in mobile community information systems, namely uncertainty 2.0.

To deal with this uncertainty 2.0 problem, I have developed a model with a combination of the aspects of context management, semantics management, and community of practice realization. Collaborative tagging for multimedia content and community-based storytelling are the key approaches to handling uncertainty problems and engineering mobile community information systems. This model is established with two foci. First, interactions and conversions between multimedia semantics and multimedia context are crucial for mobile and Web data management in mobile community information systems. Second, development of the concept community of practice has great potentials to reduce uncertainty 2.0 problems. The practices taken by communities consist of multimedia tagging and multimedia storytelling. Amateurs are able to develop their knowledge and experiences in communities of practice. Uncertainty is reduced via this cultivation of expertise with the help of community of practice. A set of mobile community information system applications have been realized in the domains of cultural heritage management and technology enhanced learning, which validates the models and approaches to uncertainty 2.0 handling.

Jessica Huster

Prozessanalyse und Ontologieevolution in kreativen, dynamischen Domänen
Reviewer: Prof. Dr. Matthias Jarke, Prof. Mareike Schoop Ph.D. (Uni Hohenheim)
Date: 10.2.2012

Today, whole work processes consist of the processing of information – both from internal and from external sources. Adequate information systems support requires the understanding of these often very complex processes and their underlying information. The semantic structures of this information are traditionally regarded as stable descriptions of a domain. But in the fashion industry sector, designers and marketers consciously cause changes in these
ontologies every season. Only if they convince customers of these new ontologies, they were able to sell their products successfully. For information systems supporting fashion-based enterprises, this requires constant radical evolution of the underlying ontologies.

This work first introduces a process analysis technology and modeling procedure, to capture the work processes in such dynamic, creative domains. Based on their knowledge transformation and conversion processes, a method is developed to support the evolution of the underlying semantic models. A substantial part of the methodology concerns the integration of this ontology evolution into the user work processes. The proposed method is validated in a case study setting of the European home textile industry.

Xiang Li

Constraint-driven Schema Integration

Reviewers: Prof. Dr. Matthias Jarke, Prof. Dr. Sonia Bergamaschi, University of Modena

Schema integration occurs in many scenarios such as database design, data integration from independently created sources, data warehousing, and schema evolution in long-lived databases. To make the integrated schema useful for querying and data interoperability, mappings between the integrated schema and the sources have to be created as well. Information preservation and minimization of the integrated schema are key requirements to schema integration methods whose automation, however, is not sufficiently addressed by previous research.

The thesis proposes a new approach to schema merging using tuple-generating and equality-generating dependencies in the two base scenarios of design-time view integration and a posteriori data integration. It provides a well-founded semantics for these tasks, and an integrated schema minimization approach which simultaneously automates the generation of query or data exchange code, while guaranteeing information preservation. We study the theoretical complexity as well as the actual performance in well-known ontology integration and data integration benchmarks, and offer adapted support for important practical special cases such as incremental schema integration.
Honorary Doctorate for Professor John Mylopoulos

On May 11, 2012, John Mylopoulos Ph.D., Professor Chiara Fama at the University of Trento/Italy, and Professor emeritus at the University of Toronto/Canada, was awarded the degree of Doctor honoris causa by the Faculty of Mathematics, Informatics, and Natural Sciences, RWTH Aachen University. The citation, handed over by Rector Prof. Dr.-Ing. Ernst Schmachtenberg, focused on his role as the father of formally based conceptual modeling.

Professors Matthias Jarke (Information Systems, RWTH Aachen, and Chairman, Fraunhofer ICT Group) and Wolfgang Marquardt (Process Engineering, RWTH Aachen, and Chairman, German National Science Council) shared the laudatory speech. In his part, Prof. Jarke used a Social Network Analysis to highlight the central role of John Mylopoulos in interlinking the fields of software engineering, artificial intelligence, and databases through conceptual modeling. Indeed, John Mylopoulos is the only individual ever who has been program chair of the top conferences in all three fields. His continued research impact has recently been documented by his award of an ERC Advanced Grant. Wolfgang Marquardt gave impressive examples how the conceptual modeling approaches fostered by John Mylopoulos have transcended other engineering fields, especially the process modeling in chemical engineering.

John Mylopoulos is the third honorary doctoral graduate of the Informatics department whose 40th anniversary had been celebrated by a colloquium earlier in the day. His two predecessors Jan van Leeuwen and Reinhard Wilhelm also participated in the awards ceremony, as did many friends and colleagues from Germany, Europe, and North America, in addition to a large turn-out from within the Informatics department and the rest of RWTH Aachen. The award ceremony was followed by a festive dinner in Aachen’s historic City Hall which lasted well into the night.
Matthias Jarke Turns 60

This year, Prof. Dr. Matthias Jarke, who holds the Chair Informatik 5 (Information Systems) turned 60. Traditionally, such an occasion is commemorated by a celebratory colloquium. It took place on 1 June and was formally opened by Prof. Joost-Pieter Katoen, the Head of the Computer Science Department. His introductory remarks highlighted Prof. Jarke’s many achievements during his 20+ years at RWTH.

Two long-standing collaborators, Tung X. Bui (University of Hawaii) and Yannis Vassiliou (NTU Athens) saw to the international flavour of the event. They talked about ‘Decision Support Systems and Digital Economies’ and ‘Information Systems Engineering’. Tradition has it that some of the honouree’s ‘academic children’ also contribute to the program of such events. Manfred Jeusfeld (PhD 1992), now with Tilburg University, gave a talk entitled ‘ConceptBase = Meta-Object Facility plus Resource Description Framework’. Klaus Pohl (PhD 1995; University Duisburg-Essen) and Peter Peters (PhD 1996; McKinsey) talked about ‘Requirements and Software Engineering’.

Matthias Jarke’s other hat is that of the Director of the Fraunhofer Institute for Applied Information Technology (FIT). Accordingly, Wolfgang Prinz, deputy director of FIT also gave a talk entitled ‘Human-centered Computing in a Process Context’. After the coffee break, this was followed by a presentation of Ulrich Trottenberg (Fraunhofer SCAI) about the research centre ‘Schloss Birlinghoven’, where FIT is based. On the occasion, Matthias was also presented with the Fraunhofer Medal in recognition of his outstanding services by Fraunhofer Board Member Dr. Alexander Kurz. After the colloquium, the party continued with a festive dinner and New Orleans jazz at Kasteel Vaalsbroek.
Since 2003, the B-IT has been pioneering the brain gain of much needed IT specialists from all over the world by offering top-level international master programs in applied informatics. In a unique cooperation between RWTH Aachen University, the University of Bonn, the Bonn-Rhein-Sieg University of Applied Sciences, and the Fraunhofer Center Birlinghoven Castle, these master programs address Media Informatics, Life Science Informatics, and Autonomous Systems, respectively. Currently, students from over 40 countries worldwide are studying in the beautiful B-IT Building on the Rhine River in Bonn-Bad Godesberg. The B-IT is directed by Professors Armin B. Cremers (Bonn), Matthias Jarke (RWTH Aachen and Fraunhofer FIT), and Kurt-Ullrich Witt. Eight endowed professorships are funded from proceeds of the B-IT Endowment, plus matching funds by NRW State.

In the academic year 2011-2012, a record number of 66 master degrees were awarded, thirty of them in the Media Informatics program which is under the responsibility of RWTH Aachen University. Since 2010, the program is coordinated by Prof. Jan Borchers, one of the endowed professorship holders, and supported by study advisor Dr. Jürgen Rapp. 42 new students were accepted into the program from almost 200 applicants, ten of them with prestigious scholarships e.g. by Erasmus-Mundus or DAAD. We were also happy to observe that many of our early B-IT graduates have by now already completed a doctorate in one of the participating universities or elsewhere. One example is Xiang Li who joined B-IT from Tsinghua University / China in late 2004, and recently completed his doctorate at RWTH Aachen University with a topic of constraint-based schema integration in databases with distinction.

Careful placement tracking of the B-IT graduates show that the dual goal of strengthening German business and science by young promising international graduates, and of improving further the linkages to their home countries by returning well-educated graduates for their local commercial and scientific job markets, has been impressively reached. The quality of the program was confirmed in 2011-2012 by re-accreditation of all B-IT Master programs until 2018, which covered not only the German ASIIN but also the new European accreditation label EurInf, which the B-IT programs were the first to achieve within all of Europe. Full details can be found in the B-IT Annual Report 2012 published in www.b-it-center.de.
The B-IT Research School aims to augment the B-IT by structured doctoral education in eight research fields of Computer Science where RWTH Aachen University, Bonn University, and the institutes FIT, IAIS, and SCAI at Fraunhofer Center Birlinghoven Castle have demonstrated critical mass in research excellence. The School is partially funded by the NRW State Research School Program for the period 2008-2013, with matching funds from the participating universities and third-party funding e.g. from industry. Professors Matthias Jarke (speaker, RWTH Aachen) and Armin B. Cremers (co-speaker, Uni Bonn) coordinate the B-IT Research School, supported by operational managers Getraud Peinel (Fraunhofer FIT) and Alexandra Reitelmann (B-IT Bonn).

In total, 32 scholarships have been awarded by the B-IT Research School, most in 2009 and 2010. About 56% come from 12 countries outside Germany, about one third are women. By now, eight scholarship holders have successfully defended their dissertations (three by women), several more theses have been already submitted.

The training program of the B-IT Research School consists of domain-specific as well as soft skill compact courses, individually tailored for doctoral candidates. Practice phases in the participating Fraunhofer institutes or in industry are also encouraged. The participants in the courses and seminars do not just include the scholarship holders but also other doctoral students within the eight mentioned areas.

Much of the training takes place in the B-IT Building in Bonn, but since early 2012, remodeling of former library space at RWTH Aachen’s Informatikzentrum has also been completed, such that the B-IT Research School can now also offer courses in Aachen. The facilities were opened in spring 2012 with the General Assembly of the B-IT Research School.
Since 2008, RWTH Aachen University helps setting up the first private technical university in the Arabic Gulf region, the German University of Technology (GUtech) in Muscat/Oman. Starting with four bachelor programs in fields of particular interest to the region (geo-sciences, sustainable tourism, architecture, and applied information technology), GUtech is now expanding by further programs in the engineering sector, including the important issues of water management and chemical process engineering. GUtech is led by former RWTH Aachen Rector Burkhard Rauhut.

For the period 2008-2012, Professor Matthias Jarke (Information Systems, RWTH Aachen) has been Inaugural Dean at GUtech, first for Applied IT, since 2010 for Engineering in general. The main role is quality control and hiring of new faculty using joint search committees between RWTH Aachen University and GUtech, initially also other tasks of a department chair until sufficiently experienced new faculty could be hired.

The academic years 2010-2012 were focused on the successful completion of the AQUIN accreditation of the Applied IT study program, and on the hiring of three additional faculty members, with strong academic and in part industrial background as well as international experience. Therefore, the department leadership was transferred in late 2011 from Prof. Jarke to a local colleague.

Due to rapid growth, GUtech had already moved to an intermediate building near Muscat Airport in 2010. In late 2012, the main building of the final GUtech building complex with facilities and housing for over 2000 planned students will be opened. On this occasion, the first batch of Bachelor students from all four early study programs will celebrate their graduation achieved in summer 2012. From the IT graduates, two will continue master studies abroad, one of them with RWTH Aachen University.
Each year, towards the end of the summer term, the Computer Science Department organises a summer party for the ceremonial presentation of diploma certificates to the graduates of the past six months. Once again, the events took place at Computer Science Centre (and its adjoining parking lot). Each event started with an introductory talk that was followed by a more humorous ceremonial talk. The official part ended with the presentation of the diploma certificates; over 150 students received their certificates at this year’s summer party.

Said official ceremony was followed by the – less formal – party proper. A small(ish) buffet and plenty of drinks were on offer. The typical crowd of about 600 people attended the events, including the graduates and their families, current students, most of the staff of the computer science department, and several guests from other departments.

The event was organized under the experienced leadership of Dr. Krempels from the Informatik 5 (Information Systems) group.