TECHNISCHE UNIVERSITÄT DRESDEN

http://www.inf.tu-dresden.de

FACULTY OF COMPUTER SCIENCE

FACULTY OF COMPUTER SCIENCE

With more than 2300 Students, the Faculty of Computer Science of the Technische Universität Dresden ranks among the largest education institutions for Computer Science in Germany. 16 different degrees like Dr.-Ing., Dr. rer. nat., Diplom, Master, Bachelor, as well as several degrees for teachers, are offered. Besides classical Computer Science and Media Computer Science, students may choose from five more study programs, including two Master programs fully taught in English.

Computer Science education at the IT location Dresden goes back to the beginnings of electronic computer engineering. Researchers from Dresden under Prof. Dr.-Ing. habil. N. J. Lehmann's leadership were among the first to conceive and build magnetic drum memory and to develop the first digital electronic computers. Today, more than 100 research projects are underway at TU Dresden, including the keystone project "Theseus" that aims to create a platform for the Internet of services, a project focussing on security improvements of operating systems by using micro-kernel technology, the „QStream" project on data stream management systems, and the "Arrive" project for the design of a universal toolkit for architecture modeling and system simulation. Founded in 1828, the Technische Universität Dresden belongs to the oldest and most venerable universities in Germany, with strong research and numerous national and international cooperations. In 1990, the Faculty of Computer Science emerged out of the Computer Science Center.

The six Institutes of the Faculty of Computer Science cover the whole spectrum of computer science, from theory to practice, from basic research to applications. A particularly high scientific competence and efficiency distinguish the faculty in the areas of software engineering, multimedia, operating systems, privacy and data security, parallel and distributed computing systems, intelligent systems, and formal methods. Modern technology, teaching and learning driven by research and practice, internationally active professors and interesting main fields of research as well as worldwide collaborations with universities and industry create best conditions.

Foto: Lothar Sprenger | www.lsprenger.de

NUMBERS AND FACTS

Numbers:
6 institutes
26 professors and lecturers
280 employees
2330 students
more than 100 current research projects
EUR 8.09 million third-party research funds in 2008
40 doctoral students

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Fakultät Informatik
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Study programs:
Computer Science
Media Computer Science
IT Systems Engineering
Teacher education

Master study programs (engl.):
Computational Logic
Distributed Systems Engineering

European Master's Program in Computational Logic

Postgraduate Study Program
Software Engineering

Degrees:
Diplom
Baccalaureate
Bachelor of Science
Master of Science
Dr.-Ing.
Dr. rer. nat.

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as of: April 2009

Foto: Lothar Sprenger | www.lsprenger.de

NEWEST COMPUTER EQUIPMENT FOR RESEARCH AND STUDIES

The Faculty of Computer Science hosts over 240 state-of-the-art computer workstations in ten PC pools, which offer a wide range of software with the operating systems Windows, Linux and Solaris. In addition to the extensive multimedia, hardware and software inventory, there are special workplaces for video editing, audio editing and virtual reality. The rooms are supervised by a team assists in solving problems and answers questions immediately. Additional WLAN workplaces and campus-wide supply of WLAN enable optimal working conditions in the whole building and its adjoining green spaces.

The Center for Information Services and High Performance Computing (ZIH), the Center of Excellence for parallel computing and software tools, is the central scientific unit responsible for the entire communication infrastructure of the university and undertakes tasks within data communication and information processing for research, teachings and studies. Since the implementation of the high-performance computer with the SGI system Altix 4700 and the PC farm with AMD Opteron Dual Core CPUs, ZIH has also been supporting scientists from all over Saxony in their research.

For students, ZIH offers several useful services and resources. That way, every student at the Technische Universität Dresden gets a user identification upon enrollment, which allows the student to publish personal websites by using the ZIH home file system.

Via so-called VPN (Virtual Private Network), ZIH provides its users with protected access to the network area of the Technische Universität Dresden. This VPN access enables the use of resources and intranet services of the Technische Universität Dresden and the Sächsiche Landesbibliothek – Staats- und Universitätsbibliothek Dresden (SLUB), from any terminal outside of the Technische Universität Dresden network. For protection of their PCs, every member of the Technische Universität Dresden is provided with anti-virus software, including update service for free.

Using hardware from Sun Microsystems and the VMware Infrastructure 3 software, a virtual computer center was built at the faculty in 2008. The ESX-Cluster consists of three Opteron Sun Fire X4200 M2 servers, each with four 2.4 GHz CPUs and a main memory capacity of 16 GB, plus seven servers, each with four 3.2 GHz CPUs and a main memory capacity of 32 GB.

Next to the computer workstations in the computer center, the faculty has different laboratories, which are used for teaching in hardware subjects, for teamwork and for research projects. By integrating the students early in the different fields of research, the faculty educates specialists that are sought-after worldwide.

“Aletheia - to us it means:
Conducting Internet innovations for the semantic web of the future.”

Prof. Dr. rer. nat. habil. Dr. h. c. Alexander Schill

aLETHEIa.

APPLICATION-ORIENTED BASIC TECHNOLOGIES

In all areas of the product lifecycle, significant product-specific data are created. Not only conventional sources of such information, but also Internet forums, blogs, wikis, e-mail and electronic documents have to be considered.

The goal of Aletheia is to develop an overall system support architecture for such product information management. In particular, semantic techniques, highly distributed data management, and seamless Internet integration are crucial issues. Based on the lifecyle- and delivery-chain-spanning management, a new dimension of a global product database is created. This is of extreme value for consumers, service providers, and producers. The particular domain of Technische Universität Dresden is the design and implementation of the global system architecture. Innovative concepts from the distributed systems area are applied; they range from modern service architectures via optimization techniques like caching and replication to fully decentralized peer-to-peer data management. Moreover, various semantic properties of heterogeneous product data are modeled and evaluated explicitly.

Based on the universal approach of Aletheia, its methods and tools can be applied towards a broad variety of use cases. Examples include the evaluation of a product series extension, the development of new product-oriented customer interaction tools, the detection of integrity violations in RFID-based logistics chains, and the provision of a universal product information interface.

Period
March 2008 - February 2011

Project administration
Prof. Dr. Alexander Schill
Dr. Daniel Schuster

Financing institution
Federal Ministry of Education and Research

External cooperation partners
SAP AG - SAP Research, BMW Group, Deutsche Post World Net, ABB, Otto

Assigned research emphases
Remote services and cooperative applications

http://www.aletheia-projekt.de

PRIVACY-ENHANCING IDENTITY MANAGEMENT

The online world has changed over the past couple of years: Some users take it for granted to publish Web diaries (blogs) that can be read from all over the world. Disclosure of personal data is commonplace in social networks, even though, once published, it is impossible for users to maintain control over that information, which allows conclusions on their behaviour. Identity theft is no longer an isolated phenomenon. Employers retrieve information on job applicants from databases even before short-listing them. Credit agencies also use personal data from the Internet to compile credit reports. This raises substantial new privacy challenges: How to protect privacy in emerging Internet applications? How to maintain life-long privacy on the global Internet?

Solving these challenges is central to PrimeLife, the follow-on project of “PRIME – Privacy and Identity Management for Europe”. Technische Universität Dresden is a partner in both projects. The objective of PrimeLife is to bring sustainable privacy and identity management to future networks and services. The research project is part of the European Union’s 7th Framework Programme and receives EUR 10 million of funding for three years.

Dr. Andreas Pfitzmann, professor for privacy and data security: *“Our work in the PRIME project has contributed to put the user perspective to the top of the agenda in the identity-management industry. With our participation in PrimeLife, we will enable concepts for data avoidance, transparency and control by the user in future products and services. This is our vision of Identity Management 2.0.”*

Period
March 2008 - February 2011

Project administration
Prof. Dr. Andreas Pfitzmann
Dr. Sandra Steinbrecher

Financing institution
European Commission

External cooperation partners
14 international partners from industry and research

Assigned research emphases
privacy-enhancing technologies, multilateral security in and by distributed systems

http://www.primelife.eu

“Biotechnology is strong in Dresden. It requires the bright minds of computer science to find the needle in the haystack of high-throughput data.”

Prof. Dr. Ing. Michael Schroeder (right in front)

gopubmed®

Searching is now sorted!

SEMANTIC SEARCH FOR THE LIFE SCIENCES

The next generation of search engines will use background knowledge to answer questions.

GoPubMed.org is such an engine for the life sciences. Classical engines directly search for keywords in text. GoPubMed searches indirectly via its knowledge about chemical compounds, biological processes, diseases, countries, persons, etc. GoPubMed knows over 120,000 concepts and relationships and links them to over 18,000,000 scientific articles. To learn about drugs relevant for avian flu, one starts typing.

The system automatically offers relevant concepts from its background knowledge, namely pharmaceutical preparations and influenza in bird. The former covers thousands of drugs, while the latter comprises at the least the terms bird flu, avian flu, and influenza in bird populations. With such an expansion of a query one gets more results rather than less.

But then comes GoPubMed’s knowledge network. It acts as an intelligent table of contents, which is used to filter the search results. Among the drugs one finds e.g. Oseltamivir and learns that it is also called Tamiflu.

The heart of GoPubMed are highly optimized algorithms, which link background knowledge and text. These algorithms have been developed over the last 8 years in EU research projects such as REWERSE and Sealife. The commercial interest in GoPubMed was so large that the company Transinsight GmbH was founded as a spin-off.

Period
March 2004 - March 2009

Project administration
Prof. Dr. Michael Schroeder

Financing institutions
European Union,
High-Tech Gründerfonds

External cooperation partners
Unilever, BASF, Transinsight GmbH

Assigned research emphases
Consolidation and establishment of the bio search engine GoPubMed

http://www.gopubmed.org

“Credo develops tools which simplify the modeling, testing and verifying of networks composed of dynamic components essentially.”

Prof. Dr. rer. nat. Christine Baier

CREDO

EVOLUTIONARY STRUCTURES FOR DISTRIBUTED SYSTEMS

When modeling and analyzing evolutionary structures for distributed services in open distributed systems, the availability of components providing services varies over time. The networks need to dynamically reconfigure communication links between components at run-time in a context-aware manner. This reconfiguration includes the (dis)connection of components, but also the adaptation and updating of both components and the network. Updates may change the computation abilities of components and the coordination abilities of the network.

For safety-critical systems, an update should not compromise the reliability of services. Updates should be initiated and effectuated in a decentralized manner. The use of formal models and validation techniques will significantly improve the confidence in dynamically reconfigurable systems, which are otherwise error-prone. This project aims at a compositional modelling and validation framework for dynamically evolving software systems, separating computation, coordination, and scheduling.

Exploiting this separation of concerns, we develop a uniform modelling language in which object-oriented components are combined with flexible communication and timing models. A new notion of service interface is essential, allowing separate design and validation of different components and of the network. Interface composition enables end-to-end reasoning about evolving systems. These interfaces specify services and formalize the context awareness needed for run-time coordination and reconfiguration. The framework will help developers design and maintain systems by validating reconfigurations. We focus on automatable and compositional validation techniques, including abstract simulation, synthesis, modelchecking, test-generation, and verification of interface compatibility.

Period
September 2006 - August 2009

Project administration for TUD
Prof. Dr. Christine Baier

Financing instiurion
European Union

External cooperation partners
Universities in Germany, Netherlands, Norways, Sweden, and China

Assigned research emphases
Model Checking, modal and temporal logics, process calculi and abstraction technologies

http://credo.cwi.nl

“MOST develops innovative technologies to integrate ontologies in programs and this way builds an important bridge between users and software developers.“

Prof. Dr. habil. Uwe Aßmann

MOSTPROJECT

ONTOLOGIES AND SOFTWARE DEVELOPMENT

The concept of model-driven software development has become more important over the last years. Thereby, software is not only programmed, but described by abstract models which are easier to understand and transformed to executable programs step by step. However, software systems get more and more complex, so that they often cannot be understood by one single person anymore. This is a huge source of errors.

One aim of the project MOST is to make this complexity controllable by supporting developers’ work with the help of semantic technologies (ontologies). Models and ontologies are linked in a way that allows to describe content-related correlations models and model elements and to search for them.

That way, it is possible to find inconsistencies between between different models automatically and to generate solutions to remove them.

Another aim is to guide developers through the complicated process of software development by creating suggestions about which tasks have to be accomplished next, based on semantically enriched process definitions. For example, if another linked model has to be changed, the developer needs to be informed instantly. This is supposed to reduce potential sources of error and to increase the quality of the emerging software.

By collaborating with partners in industry and research, it is ensured that the project results indeed refer to the practice.

Period
February 2008 - January 2011

Project administration for TUD
Prof. Dr. Uwe Assmann

Financing institution
EU 7th Framework IST, STREP

External cooperation partners
University Koblenz-Lindau, SAP Research Karlsruhe, BOC Wien, University of Aberdeen, Comarch S.A. Poland

Assigned research emphases
Software engineering, modeling, model driven development

http://www.most-project.eu

“The project Zoomable Cell will help to uncover the secret of the human cell.”

Prof. Dr. rer. nat. Stefan Gumhold

Zoomable Cell

INTERACTIVE JOURNEY THROUGH THE HUMAN CELL

For the first time it will be possible for researchers as well as interested laymen to navigate continuously from a complete human cell to single amino acids and atoms. The “Zoomable Cell“ project was launched by the Chair of Computer Graphics and Visualization, and the Biotechnological Centre (Biotec) of the Technische Universität Dresden. This journey through the cell is brought to life by an easy-to-use interactive 3d browser.

A central problem, which the Dresden researchers have to solve, is the fast visualization of an enormous amount of diverse data. This includes the data for several thousand proteins down to their atomic structure and function in the cell. More data exists as 2d and 3d pictures, from light and electron microscopes, with a sub micrometer resolution. Data in the nanometer range has been created by computer simulations.

The measured and simulated data were gained from many cells of varying shape. The 3d browser should enable a continuous navigation between the datasets. To achieve this goal, in each dataset the contained cellular parts such as the nucleus are identified and marked. Next, the datasets are linked at comparable parts into a complex network. Finally, the 3d browser overlays the linked datasets at the marked parts in the current dataset and offers the user to turn, like at a crossroad, to another dataset and, in this way, navigate in the complex network.

A flexible software design shall allow the use of the cell browser in a VR-environment as well as in a Web browser. Thus, it will be possible for a large community of users to collect and label datasets and to expand the collective knowledge about the human cell.

Period
September 2008 - September 2011

Project administration
Prof. Dr. Stefan Gumhold
Prof. Dr. Michael Schroeder

Financing institution
German Research Foundation

External cooperation partners
MPI-CBG, CRTD, GeneOntology Consortium, University Tübingen, University Bonn

Assigned research emphases
Scientific Visualization, protein interactions, interactive VR applications

http://cgv.inf.tu-dresden.de/ZoomableCell

AUTEG

COMPUTER-ASSISTED ENGINEERING

In “Intelligent Buildings“, factories or cars, complex networks of sensors, actuators and controllers are implemented. Such networks are used to assist the human users, improve their safety or save energy. Modern buildings for example can contain more than 20,000 of such decentralized devices. The network design is difficult, expensive and error-prone.

Therefore, the AUTEG project introduces a high level of computer assistance into the design flow. A novel design tool is developed, which retrieves all preconditions or constraints in previous CAD data and collects all user requirements by interactive interfaces. It then designs the network solutions automatically, consisting of all decentralized devices, their applications, parameterizations, bindings and topology. As design algorithms, Generative Programming and Evolutionary Algorithms are applied. They use solution libraries for generating functional designs, and semantic product databases and technologies to retrieve suitable devices and applications.

All design steps proceed iteratively, leading to more and more optimized solutions. At the end the design tool provides the optimized network solutions, which can finally be used for the commissioning at the construction site. The users of the tool do not notice the complexity of the underlying algorithms and design steps, which makes the tool perfectly suitable not only for planners, but also for builders.

Period
January 2007 - December 2011

Project administration
Prof. Dr. Klaus Kabitzsch

Finacing institution
Federal Ministry of Economics and Technology

External cooperation partners
ABB, WAREMA, Thermokon, SPEGA, GFR, MSR, Dr. Schiller & Partner, Innotec, GWT

Assigned research emphases
Model encouragement, commissioning, testing and diagnosis of networked buildings

http://www.ga-entwurf.de

“Multicore and Manycore architectures push us to substantial new challenges in the context of programming and scaling.”

Prof. Dr. rer. nat. Wolfgang E. Nagel

ParMA

PARALLEL PROGRAMMING FOR MULTI-CORE ARCHITECTURES

Modern scientific-technical calculations and complex simulation tasks require more and more computational power. The technical and physical possibilities of increasing the clock frequency are more or less exhausted. For that reason, another significant increase of efficiency can be expected in the future by the use of the multi-core technology and the parallelization of programs. On a single chip, several processor kernels are implemented – the number will rise from currently two to four up to 16 to 32.

To manage these challenges, the Center for Information Services and High Performance Computing (ZIH) was joined by the GWT-TUD GmbH and another 15 European partners in a collective research project called “Parallel Programming for Multi-Core Architectures” (ParMA).

The main emphases of the project ParMA are the descriptions of new programming models and methods for parallel programs, to extend and improve the management of a large number of parallel tasks/threads, for the development of modelling tools of linkage networks for MPSoC (MultiProcessor System-on-Chip) as well as the integration and extension of parallel programming and performance analysis tools. Progressive technologies are demonstrated based on various economic applications.

With the program Vampir, the ZIH has an efficient performance analysis tool, which translates information into a huge number of graphical representations and which users can employ to directly optimize their applications. The tool is supposed to be improved and combined with other tools during the period of the project.

Period
June 2007 - May 2010

Project administration
Prof. Dr. Wolfgang E. Nagel

Financing institution
Federal Ministry of Economics and Technology

External cooperation partners
17 partners from France, Germany, Spain und Great Britain

Assigned research emphases
parallelel computing
high-performance computing

http://www.parma-itea2.org

Foto: Arvid Schmolze | www.schmolze-radiant.de

CONFERENCES & RESEARCH PRICES

Every year, the Faculty of Computer Science holds many international and national conferences or symposia about different IT subjects and is represented actively with contributions worldwide, respectively. Presentations in Australia, the USA, Indonesia, China and Europe, numerous publications, and research stays of renowned guest researchers from all over the world reflect the high appreciation of the research results at the Faculty of Computer Science – extensive, numerous industrial cooperations around the globe guarantee innovative ideas and a high level of the students' education at the faculty. Thus, in 2008 guest researchers from New Zealand, Brasil, Cambodia, Serbia and Montenegro, France, Greece and the Ukraine participated in lectures of the faculty in the context of tertiary cooperation and cooperation projects.

Dipl.-Ing. Mathias Ullrich, Martin Vogt, Henri Grüneberg were honored with the award *Otto-Hänsel-Preis* by the foundation Otto-Hänsel-Stiftung of the Technische Universität Dresden for their outstanding Diploma and study projects, respectively.

The award *Georg-Helm-Preis* of Technische Universität Dresden went to Dr.-Ing. Anni-Yasmin Turhan for her dissertation "On the Computation of Common Subsumers".

On 15th of May 2008, the nationwide finale of the worldwide largest technology competition – the *Microsoft Imagine Cup* – took place. The Technische Universität Dresden group – HitchOP (Dang Hai Le, Stefan Schmutz, Dominik Vock) – achieved second place with their project about the optimization of inner-city lifts.

Andrey Brito wins the *"OpenSPARC Community Innovation Award"* with an intelligent software that filters huge amounts of data in real time.

Ubrigate, a start-up of former staff members of the Chair of Technical Information Management Systems and the Chair of Software Technology, won the special price awarded by DHL and T-Systems at the international *European Satellite Navigation Competition*.

Winners of the *IEEE Services Computing Contest 2008* are Dirk Habich and Sebastian Richly of the Faculty of Computer Science with their project OSPP – Open Service Process Platform.

Winner in the three-episodic competition *BOWS-2*, with which the expert network "European Network of Excellence for Crypology" (ECRYPT) tests the robustness of watermarks in digital media, is Dr. Andreas Westfeld of the Institute of Systems Architecture, Chair of Privacy and Data Security.

"ClusterMeister", a team of students of the Indiana University and the Technische Universität Dresden, achieved first place in the *SC08 Cluster Challenge*, an international competition in the field of energy-efficient high-performance computing.

The *HP-IAPP Privacy Innovation Award* for the EU project PRIME acknowledges its profound influence on privacy-aware identity management. Algorithms from the collection Signa in Silico are the basis of a *reddot design award*.

Foto: Lothar Sprenger | www.lssprenger.de

INTERNAL AND EXTERNAL RESEARCH CENTERS

International Center for Computational Logic

The International Center for Computational Logic (ICCL) is an interdisciplinary center of competence in research and teaching in the field of Computational Logic, with special emphasis on Algebra, Logic and Formal Methods in Computer Science.

It´s essentially borne by the Artificial Intelligence Institute and the Institute of Theoretical Computer Science at the Faculty of Computer Science as well as by the Institute of Algebra at the Faculty of Science.

ICCL is coordinating the European Master's Program in Computational Logic, one of the very few programs of study supported by Erasmus Mundus.

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Biotechnology Center (BIOTEC)

The Biotechnology Center of the Technische Universität Dresden is a unique interdisciplinary center focusing on research and teaching in molecular bioengineering. The BIOTEC hosts top international research groups dedicated to genomics, proteomics, biophysics, cellular machines, molecular genetics, tissue engineering and bioinformatics.

The BIOTEC has some 230 members from 35 countries from Eastern and Western Europe, Asia, Australia and America that work in the fields of biology, medicine, physics, chemistry, computer science and engineering.

The BIOTEC provides excellent lab facilities and an infrastructure which enables the collaboration with other companies residing in the same building.

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Future Manufacturing at SAP Research

At the campus-based Engineering Center SAP Research CEC Dresden, advanced software technologies for future manufacturing environments are being investigated. An example is the early prediction of maintenance tasks based on specific failure models. The solution is tightly integrated both with the manufacturing and with the enterprise resource planning layer. Another area is the control of complex logistics chains. Based on automatic event processing, important state changes of a transportation system are analyzed, integrated, and evaluated within higher control layers.

The cooperation between SAP and TU Dresden on these and other subjects includes a joint PhD program and several consortium projects.

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DIRECTIONS TO THE FACULTY OF COMPUTER SCIENCE

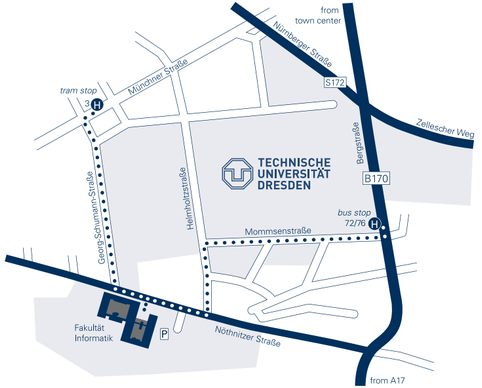
The building Nöthnitzer Straße 46 is not directly accessible by *public transport*, but the tram stop "Münchner Platz" of tram 3 or the bus stop "Mommsenstraße" of lines 72/76 are only a walk of five to ten minutes away.

From the stop Münchner Platz, cross the rails and the street towards the building Schumann-Bau and walk up Georg-Schumann-Straße to Nöthnitzer Straße (about 450 meters). On the opposite side on the left you can already see the new faculty building. The main entrance is about 50 meters further on the left side.

From the stop Mommsenstraße, walk up the Bergstraße a few meters,then turn right into Mommsenstraße. Follow the street to the end where it crosses Helmholtzstraße (about 450 meters). Turn left upwards, pass the Leibniz-Institut IFW and you cross Nöthnitzer Straße (250 meters). 100 meters further right on the opposite side of the street you can already see the new faculty building.

If you arrive by *airplane*, you can either take the taxi or the S-Bahn 2. The S-Bahn leaves every 30 minutes from Dresden Airport to Dresden main station. From the main station, take the tram 3 (towards Coschütz) to the stop Münchner Platz.

Arriving by *train*, step out at Dresden main station and go on as described above.



By *car* on the Autobahn A4 from Chemnitz/Leipzig or Berlin, leave A4 at Dreieck Dresden-West and change to Autobahn A17 in the direction to Prague. Leave A17 at the exit Südvorstadt. Drive along the B170 towards Zentrum. Follow the sign in the direction of Plauen, turn left into Nöthnitzer Straße. The faculty building is about 500 meters further on the left side.

LIST OF PROFESSORS (1/4)

Chair of Industrial Communications
Institute of Applied Computer Science

Prof. Dr.-Ing. habil.
Martin Wollschlaeger
Director of Institute

- Industrial communication systems – Ethernet-based systems, fieldbus systems, heterogeneous networks management
- Information models in automation, device and interaction models in Life Cycle, semantic annotations, continuous description methods
- Industrial Internet – integration of IT solutions and automatization systems, web technologies in automation

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Chair of Human-Computer Interaction
Institute of Applied Computer Science

Prof. Dr. rer. nat. habil.
Gerhard Weber

- User-centered design of adaptable, multimodal and multimedia user interfaces
- Ambient Assisted Living – navigation and new mobile services for mobility impaired people
- Adaptation and adaptivity in time-dependent media for blind, visually impaired, deaf or dyslexic people
- Digital libraries for readers with special needs

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Chair of Modelling and Simulation
Institute of Applied Computer Science

Prof. Dr. rer. nat.
Oliver Rose

- Modeling, simulation, and analysis of the material flow in complex production facilities like, for instance, semiconductor manufacturing facilities or assembly lines for planes
- Methods for the performance evaluation of production facilities
- Robust methods for the operational control of production facilities
- Tool-independant modeling of production facilities (Modeling standards)

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Chair of Technical Information Management Systems
Institute of Applied Computer Science

Prof. Dr.-Ing. habil.
Klaus Kabitzsch

- Distributed, linked automation systems, fieldbuses, applications in plants and buildings, ambient assisted living
- Wireless sensor networks
- Process identification, advanced control, predictive maintenance
- Design, test and diagnosis tools for automation systems, PLC, embedded systems
- LONWORKS reference asset

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Chair of Computational Logic
Institute of Artificial Intelligence

Prof. Dr. rer. nat. habil.
Michael Thielscher
Director of Institute

- Computational Logic
- Knowledge Representation
- Cognitive Agents
- General Game Playing
- Constraint Logic Programming

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Chair of Bioinformatics
Institute of Artificial Intelligence

Prof. Dr.-Ing.
Michael Schroeder

- Ananlysis of gen expression and protein interaction data
- Gene annottion with text-mining and ontologies
- Applications in neurodegeneration and pancreas cancer

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http://www.biotec.tu-dresden.de/schroeder

LIST OF PROFESSORS (2/4)

Chair of Knowledge Representation and Reasoning

Institute of Artificial Intelligence

Prof. Dr. rer. nat. habil.
Steffen Hölldobler

- Logic and Logic Programming
- Knowledge Representation and Inference
- Connectionist Systems

INF 2006
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Chair of Multimedia Technology

Institute of Software and Multimedia Technology

Prof. Dr.-Ing.
Klaus Meißner
Director of Institute

- Development methods and system architecture for distributed, adaptive, multimedia applications in mobile and web scenarios
- Advanced rich media user interface techniques for web service oriented applications
- Collaboration and communication techniques in virtual teams, communities and organisations
- Personal information life cycle management: semantic modelling and management of multimedia information, documents and applications

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Chair of Computer Graphics and Visualisation

Institute of Software and Multimedia Technology

Prof. Dr. rer. nat.
Stefan Gumhold

- Development of interactive 3D applications for PC and VR systems
- Scanning and processing of static and dynamic geometry models
- Model reduction for the interactive simulation of natural phenomena
- Basic research and development of customized applications in the domain of scientific visualization

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Chair of Media Design

Institute of Software and Multimedia Technology

Prof. Dr.-Ing. habil.
Rainer Groh

- Concept and design of interactive systems
- 3D-Projection principles according to human perception
- Design methods of Human-Computer Interaction

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Chair of Software Technology

Institute of Software and Multimedia Technology

Prof. Dr. rer. nat. habil.
Uwe Aßmann

The Chair for Software Technology deals in its research work with the edges between classical software technology and other computer science fields, in a theoretical as well as in a practical area. Special emphases are:

- Construction of product lines
- Component-based software engineering
- Use of logic and semantic in software engineering

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Workgroup Didactics of Computer Science

Institute of Software and Multimedia Technology

Prof. Dr. paed. habil.
Steffen Friedrich

- teaching methodology of ICT / ICT teaching
- didactical aspects of e-learning
- educational standards of ICT at schools

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LIST OF PROFESSORS (3/4)

Chair of Databases
Institute of Systems Architecture

Prof. Dr.-Ing.
Wolfgang Lehner
Director of Institute

- Data Streams
- AOS: Sampling in databases
- Model-Driven Data Engineering
- Data-aware service orchestration
- Database technology for analysis of large datasets (Data Warehouse systems, OLAP and Data Mining support)
- Advanced Data Analysis for Photo Mask Production

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Chair of Operating Systems
Institute of Systems Architecture

Prof. Dr. rer. nat.
Hermann Härtig

- Microkernel-based operating systems
- Real-Time Systems, embedded systems
- Secure-System Architectures
- Virtual-Machine Technology
- Interaction HW/SW Architectures

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Chair of Privacy and Data Security
Institute of Systems Architecture

Prof. Dr. rer. nat.
Andreas Pfitzmann
Dean of Student Affairs

- Privacy-enhancing technologies (identity management, anonymous communication)
- Multimedia security (multimedia forensics, steganography and steganalysis, digital watermarking)
- Multilateral security in and by distributed systems (design of secure distributed applications, reputation systems, biometrics)
- Channel coding theory

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Chair of Computer Networks
Institute of Systems Architecture

Prof. Dr. rer. nat. habil.
Dr. h. c.
Alexander Schill

- SOA for the Future Internet
- Mobile and Ubiquitous Computing
- Real-Time Collaboration
- Network Security and Network Design
- Internet Information Retrieval

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Chair of Systems Engineering
Institute of Systems Architecture

Prof. Dr.
Christof Fetzer

The more computers are being trusted, the more necessary it becomes to learn how to create computer-based systems which you can rely on. The focus of this group lies on the investigation about how you can build trustworthy systems which range from uncritical systems in private households to safety-critical systems.

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Chair of Embedded Systems
Institute of Computer Engineering

Prof. Dr.-Ing.
Christian Hochberger
Director of Institute

The research works of the chair are all about the central subject embedded systems. Thereby, especially the interactions with actual developments are picked up. Re-configurability and adaptivity are examples for this as well as the usage of object-oriented programming languages using the example of Java.

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LIST OF PROFESSORS (4/4)

Chair of Computer Architecture
Institute of Computer Engineering

Prof. Dr. rer. nat.
Wolfgang E. Nagel
Dean

- Software tools for the support of programming and optimization
- Programming methods and technologies for high-performance computers
- Grid-computing
- Architecture and performance analysis of high-performance computers
- Algorithms and methods for the modeling of biological processes

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Chair of VLSI Design, Diagnostics and Architecture Institute of Computer Engineering

Prof. Dr.-Ing. habil.
Rainer Spallek

- Circuit, Processor and System Design
- Modelling and Simulation of Electronic Systems
- Test and Diagnosis of Complex Systems
- Dependability and Heterogenous System Architectures

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Chair of Automata Theory
Institute of Theoretical Computer Science

Prof. Dr.-Ing.
Franz Baader
Director of Institute

- Knowledge Representation (in particular, Description Logics and Modal Logics)
- Automated Deduction (in particular, Term Rewriting, Unification, and Constraint Solving)
- Automata Theory (in particular its applications in logics)

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Chair of Algebraic and Logical Foundations of Computer Science Institute of Theoretical Computer Science

Prof. Dr. rer. nat.
Christine Baier

- modeling
- specification and analysis of reactive systems
- model checking
- coordination languages
- probabilistic systems
- verification of quantitative properties

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Chair of Foundations of Programming
Institute of Theoretical Computer Science

Prof. Dr.-Ing. habil.
Heiko Vogler
Vice Dean

- automata theory
- formal models for natural language processing
- functional programming

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LECTURERS & CO-MEMBERSHIPS (1/1)

Senior Lectureship in Neuroinformatics
Institute of Artificial Intelligence

Doz. Dr. rer. nat. habil.
Boris Flach

- Structural models for image recognition and machine learning: stochastic neural networks, Markov Random Fields, Soft Constraint Satisfaction problems
- Regular and context-free stochastic image languages (on graphs)
- Combinatorial and convex Optimization
- Applications in biomedicine, remote sensing and technical diagnostics

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Workgroup Applied Knowledge Representation and Reasoning Institute of Artificial Intelligence

Doz. Dr.-Ing. habil.
Uwe Petersohn

- Intelligent Agents, Search Algorithms, Discrete Optimization, Planning
- Logic and Knowledge Representation, Hybrid Knowledge Models, Problem-solving, Uncertain Knowledge and Reasoning
- Case-Based Reasoning, Making Complex Decisions
- Methods of Machine Learning

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Senior Lectureship in Tools for Computer Design
Institute of Computer Engineering

Doz. Dr.-Ing. habil.
Rainer W. Schulze

- Parallel processing
- Systems optimization
- Optimization of connection structures in massively parallel systems for the direct implementation of numeric algorithms

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Faculty of Business Management and Economics
Chair of Business Informatics, esp. Information Systems in Trade and Industry
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Faculty of Mathematics and Natural Sciences
Chair of Theory of Algebraic Structures
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Faculty of Electrical and Computer Engineering
Chair of Mobile Communications Systems
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Faculty of Mechanical Engineering
Chair of Engineering Design and CAD
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Faculty of Electrical and Computer Engineering
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Publisher: Technische Universität Dresden, Fakultät Informatik
Editorial office: Silvia Kapplusch
Layout: Florian Schneider
Photos: Florian Schneider
Printing: addprint AG

Press date: April 2009