

international  
conference  
s u m m e r  
k o b l e n z  
2 0 0 5

|       |                 |
|-------|-----------------|
| SEFM  | KI              |
| MATES | TABLEAUX<br>FTP |

AGKI

Universität Koblenz-Landau

<http://www.uni-koblenz.de/ag-ki/confsummer.html>

# Start smart!

Karrierechancen für:

- Informatiker
- Elektrotechniker
- Mathematiker
- Physiker



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**Prof. Dr.  
E. Jürgen  
Zöllner**

Sehr geehrte Damen und Herren,

im September 2005 wird der Campus Koblenz im Rahmen verschiedener hochrangiger Fachkonferenzen zum wissenschaftlichen Zentrum in den Bereichen Informatik, Künstliche Intelligenz und Softwareentwicklung. Das breite Themenspektrum sowie die unterschiedlichen Nationalitäten der Teilnehmerinnen und Teilnehmer und nicht zuletzt die Kongresssprache Englisch belegen, dass erfolgreiche Forschung in zunehmendem Maße interdisziplinär und international ausgerichtet ist. Ähnliche Tendenzen sind übrigens im Bereich der Lehre, insbesondere bei der Einführung neuer Studiengänge, festzustellen.

Die Universität Koblenz-Landau ist mit fast 11.000 Studierenden im Sommersemester 2005, die sich etwa hälftig auf die beiden Standorte verteilen, die drittgrößte Hochschule in Rheinland-Pfalz. Sie hat sich nicht nur in der Lehrerausbildung einen guten Namen gemacht, sondern zählt beispielsweise auch in der Kategorie Wirtschaftsinformatik mit dem noch jungen Studiengang „Informationsmanagement“ mit den Abschlüssen Bachelor of Science bzw. Master of Science zu den besten Anbietern in Deutschland.

Die Einführung weiterer innovativer Bachelor-Studiengänge, wie „Ecological Impact Assessment“ und „Anglistik und Medienmanagement“, unterstreicht, dass der Bologna-Prozess voranschreitet.

Zu den charakteristischen Forschungsschwerpunkten am Campus Koblenz mit Bezug zu den Konferenzthemen gehören u. a. Computerbetriebssysteme und Echtzeitsysteme, E-Learning, Künstliche Intelligenz und Softwaretechnik. Der Arbeitsgruppe Künstliche Intelligenz unter Leitung von Herrn Professor Dr. Furbach und Herrn Juniorprofessor Dr. Beckert möchte ich an dieser Stelle für ihr Engagement rund um den International Conference Summer meinen besonderen Dank sagen.

Den teilnehmenden Wissenschaftlerinnen und Wissenschaftlern wünsche ich neben fruchtbaren Fachdiskussionen einen anregenden Aufenthalt in Koblenz und Umgebung.

**Prof. Dr. E. Jürgen Zöllner**

Minister für Wissenschaft, Weiterbildung, Forschung und Kultur

Herzlich willkommen zur 28. German Conference on Artificial Intelligence hier in Koblenz. Unsere Stadt an Rhein und Mosel wird in diesen Tagen zum Zentrum für viele Wissenschaftler aus aller Welt, die hierher kommen, um an hochrangigen Konferenzen und Symposien rund um die Thematik der Künstlichen Intelligenz teilzunehmen.

Die Fachdisziplin Künstliche Intelligenz hat sich längst in Forschung und Lehre etabliert und ist heute ein wichtiger Bestandteil der Informatik mit interdisziplinärem Charakter. Auch hier an der Universität Koblenz spielt diese Fachdisziplin eine wichtige Rolle, ich bin deshalb sicher, dass Herr Prof. Dr. Ulrich Furbach und sein Team rund um den „International Conference Summer - Koblenz 2005“ ein attraktives Programm mit interessanten Vorträgen, Workshops und Symposien vorbereitet haben.

Dabei ist unsere junge Universitätsstadt ein idealer Gastgeber. Bereits heute verfügt Koblenz über eine gewachsene und gut entwickelte Forschungsinfrastruktur. Partnerschaften und strategische Allianzen unserer Hochschulen mit der örtlichen Wirtschaft bringen vor allem dem Fachbereich Informatik breite Unterstützung.

Aber Koblenz ist nicht nur ein idealer Ort zum tagen. Als Bestandteil des UNESCO-Welterbes Mittelrhein ist unsere Stadt die Fremdenverkehrsmetropole in der Region und wird 2011 Gastgeber der Bundesgartenschau sein.

Sie werden auf Ihrer Konferenz viel über fachliche Neuheiten und Anwendungen neuer wissenschaftlicher Erkenntnisse hören. Ich wünsche Ihnen interessante Stunden, wünsche Ihnen aber auch, dass Sie trotz der vor Ihnen liegenden Arbeit die Zeit finden, einige der Vorzüge unserer schönen Stadt genießen zu können.

Es grüßt Sie freundlich

Ihr

**Dr. Eberhard Schulte-Wissermann**  
Oberbürgermeister der Stadt Koblenz



**Dr. Eberhard  
Schulte-  
Wissermann**



**Ulrich  
Furbach**

Dear colleagues, dear friends,

In September 2005, Koblenz is the meeting point of international computer scientists:

- KI 2005: 28th German Conference on Artificial Intelligence
- MATES 2005: 3rd German Conference on Multi-Agent System Technologies
- SEFM 2005: 3rd IEEE International Conference on Software Engineering and Formal Methods
- TABLEAUX 2005: International Conference on Automated Reasoning with Analytic Tableaux and Related Methods
- FTP 2005: 7th International Workshop on First-Order Theorem Proving-Workshop Beyond the Horizon.



**Bernhard  
Beckert**

These conferences cover an extremely broad spectrum of topics: AI in general, including philosophical, computer science and engineering aspects (KI), multi-agent systems (MATES), automated reasoning and knowledge representation (TABLEAUX and FTP), software engineering (SEFM), and even political and strategic aspects (Beyond the Horizon).

Welcome to the International Conference Summer 2005. Enjoy the fantastic summer right in the center of four highland regions, at the "Deutsches Eck", right in the middle of part of the UNESCO World Heritage, in one of the world's best-known wine-growing regions. Enjoy your conferences.

**Ulrich Furbach, Bernhard Beckert**

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**General Chair**  
**Peter H. Schmitt**

SEFM, the International IEEE conference on Software Engineering and Formal Methods, has come a long way already in its short history; from Australia to China to Germany, and on all three continents it has been a success. The goals of our conference, to promote the use of formal methods for software engineering in industry and government applications and to support advances in theoretical insights how and why these methods work, has proved to be a truly global issue. Science has always been international, already in times when the word "globalisation" was not yet coined. Yet, it cannot be denied that the globalisation of scientific research has become faster and denser. But the biggest difference today is that also applications of the methods developed in university and company labs has become global. SEFM is in an excellent position to serve this need. When you read this the conference is, most likely, still about to happen. Yet, it is, as I implicitly said above, already a success. We have been able to invite five superb keynote speakers, the program committee could select 40 high-quality papers out of 120 submissions and the affiliated events offer four very good tutorials and two attractive workshops. Now, it is your turn to contribute as a presenter or as an active member of the audience to make this event what it deserves to be. Enjoy the conference and its opportunities for social contacts with your colleagues and friends and also, I hope, the city of Koblenz and its magnificent surroundings. I wish you successful days at SEFM 2005.

**Peter H. Schmitt**

|       | Monday, Sept 5   | Tuesday, Sept 6  | Wednesday, Sept 7   | Thursday, Sept 8   | Friday, Sept 9  |
|-------|--|--|---|--|---|
| 9.00  | Tutorial 1 Room F313<br>Tutorial 2 Room F314           | Tutorial 3 Room F313<br>TRain Workshop Room F413<br>Verisoft Meeting Room D239 | Opening Session Auditorium A  | Invited Talk 3:<br>K. RUSTAN M. LEINO<br>Auditorium A              | Invited Talk 5:<br>JOSEF SIFAKIS<br>Auditorium A                  |
| 9.30  | Verisoft Meeting Room D239                             |  | Invited Talk 1:<br>WOLFGANG J. PAUL<br>Auditorium A                 | Session 3: Program Verification I<br>Auditorium A                  | Session 6: Program Verification IV<br>Auditorium A                |
| 10.00 |  |  |   |  |   |
| 10.30 | Coffee Break   | Coffee Break   | Coffee Break  | Coffee Break   | Coffee Break  |
| 11.00 | Tutorial 1 Room F313<br>Tutorial 2 Room F314           | Tutorial 3 Room F313<br>TRain Workshop Room F413<br>Verisoft Meeting Room D239 | Session 1B:<br>Real-time<br>Systems<br>Auditorium B                 | Session 4A:<br>Program<br>Verification II<br>Auditorium A          | Session 7A:<br>Abstraction<br>Auditorium A                        |
| 11.30 | Verisoft Meeting Room D239                             |  | Session 1A:<br>Testing<br>Auditorium A                              | Session 4B:<br>True<br>Concurrency<br>Auditorium B                 | Session 7B:<br>Human-<br>Computer<br>Interaction<br>Auditorium B  |
| 12.00 |  |  |   |  |   |
| 12.30 |  |  | Lunch   | Lunch  | Lunch   |
| 13.00 | Lunch  | Lunch  | Lunch   | Lunch  | Lunch   |
| 13.30 |  |  |   |  |   |
| 14.00 | Tutorial 1 Room F313<br>Tutorial 2 Room F314           | Tutorial 4 Room F313<br>TRain Workshop Room F413<br>Verisoft Meeting Room D239 | Invited Talk 2:<br>DINES BJØRNER<br>Auditorium A                    | Invited Talk 4:<br>ANTHONY HALL<br>Auditorium A                    | Session 8A:<br>Tools and<br>Practice<br>Auditorium A              |
| 14.30 | Verisoft Meeting Room D239<br>TRain Workshop Room F413 |  |   |  | Session 8B:<br>Component-<br>based<br>Development<br>Auditorium B |
| 15.00 |  |  | Coffee Break  | Coffee Break   |   |
| 15.30 | Coffee Break   | Coffee Break   | Session 2A:<br>Static Analysis<br>Auditorium A                      | Session 5A:<br>Program<br>Verification III<br>Auditorium A         | Coffee Break  |
| 16.00 | Tutorial 1 Room F313<br>Tutorial 2 Room F314           | Tutorial 4 Room F313<br>TRain Workshop Room F413<br>Verisoft Meeting Room D239 | Session 2B:<br>Requirements<br>and<br>Specification<br>Auditorium B | Session 5B:<br>FM for<br>Maintenance<br>and Change<br>Auditorium B | Session 9: Quality of Service<br>Auditorium A                     |
| 16.30 | Verisoft Meeting Room D239<br>TRain Workshop Room F413 |  |   |  |   |
| 17.00 |  |  |   |  | Closing Session Auditorium A                                      |
| 17.30 |  |  |   |  |   |
| 18.00 |  |  | Welcome Reception   | Excursion:<br>Fortress Ehrenbreitstein                             |   |
| 18.30 |  |  |   |  |   |
| 19.00 |  |  |   |  |   |
| 19.30 |  |  |   |  |   |
| 20.00 | TRain Workshop Dinner                                  |  |   | Conference Dinner  |   |

## Workshop 1

Monday,  
Sept 5, after-  
noon and  
Tuesday,  
Sept 6, all  
day  
Room F413

**TRain: Towards a Domain Theory of Railways**

## Abstract:

Before safety-critical software (and in general any software) can be designed, requirements must be formulated; before requirements can be formulated, the application domain must be understood. All other engineering branches build on theories of their own application domains: Newtonian mechanics provides the basis for automotive engineers; aerodynamics for aircraft designers; and hydrodynamics for ship designers. In the same way, software engineers developing software for rail applications must build on a theory of the railway domain. But there is no such theory.

TRain is a loosely knit group of international researchers and technologists who are interested in establishing a theory for transportation domains, specifically including railways. The scope of the workshop includes diverse models of railway facets, from rail nets and their control, to traffic and its control, from planning nets, timetables, train maintenance, and rostering to their monitoring. The goal of the workshop is to identify about five main topics to which diverse groups could apply their tools (ASM, B, CafeOBJ, CASL, Circus, CommUnity, CSP, CTP (Communicating Transaction Processes), Duration Calculi, Message and Live Sequence Charts, Petri Nets, RAISE, Statecharts, TLA+, VDM, Z, etc.) and to identify core theory elements.

## Workshop 2

**BEYOND THE HORIZON****Anticipating Future and Emerging Information Society Technologies**

*This workshop is by invitation only.*

## Abstract:

The purpose of the BEYOND THE HORIZON project is to provide input about IST-related emerging trends and strategic research areas that require support, through a well-organised, extensive and systematic consultation of the relevant research community throughout Europe, involving the main actors and experts in the related fields. The particular goals are:

1. to identify advanced strategic areas and challenging long-term goals;
2. to analyse their scientific, societal, and industrial impact and to deliver roadmaps for paving advances in these areas within a timeframe of fifteen years; and
3. to investigate new frontiers for ICT research, to identify the boundaries with other disciplines, as well as interrelationships among them and opportunities for cross-fertilization.

## TUTORIALS

Monday,  
Sept 5,  
all day  
Room F313

## Tutorial 1

**Building, Combining, and Integrating Decision Procedures for Software Verification**

David Déharbe, Silvio Ranise, Christophe Ringeissen

## Abstract:

Decision procedures, their combination, and their integration with other reasoning activities (such as Boolean solving or quantifier handling) have recently attracted a lot of attention because of their importance for many verification techniques (such as bounded model checking, software model checking, and deductive verification to name but a few). In this tutorial, we will describe some of the techniques which allow us to build, combine, and integrate decision procedures.

Monday,  
Sept 5,  
all day  
Room F314

## Tutorial 2

**Unified Modeling Language 2.0 - Concepts and Semantics**

Alexander Knapp, Harald Störrle

## Abstract:

The upcoming new version 2.0 of the UML introduces many new concepts and a substantial re-engineering of the metamodel. One of the persistent shortcomings of the UML, however, is its lack of semantic foundations, which has inspired a lot of research in the formal methods community. In this tutorial, we would like to introduce the new version of the UML, with a particular emphasis on its semantic foundations.

The tutorial will present a unique opportunity for participants of SEFM 2005 to get acquainted with the new version of the standard and the state of the art concerning the relationship between the UML and formal methods.

Tuesday,  
Sept 6,  
morning  
Room F313

## Tutorial 3

**An Introduction to CSP || B**

Neil Evans, Steve Schneider, Helen Treharne

## Abstract:

The tutorial starts with an overview of the B-Method, the process algebra CSP, and their respective tool support. A discussion of how they can be combined will be illustrated. The theoretical foundations underpinning the CSP || B approach will be presented with particular focus on compositional verification. The running examples will demonstrate how the industrial-strength tools can be applied to the verification of a CSP || B specification. The tutorial concludes by outlining application domains which would benefit from using CSP || B.

## Tutorial 4

Tuesday,  
Sept 6,  
afternoon  
Room F313

**QoS Modelling and Verification with UML Statecharts**

Holger Hermanns, David N. Jansen, Joost-Pieter Katoen

**Abstract:**

The UML is an influential and widespread notation for high-level modelling of information processing systems. UML statechart diagrams are a graphical language to describe system behaviour. They constitute one of the most intensively used formalisms comprised by the UML. However, statechart diagrams are lacking concepts for describing real-time, performance, dependability and QoS characteristics at a behavioural level.

In this tutorial, we present a QoS-oriented extension of UML statechart diagrams, called StoCharts. StoCharts enhance the basic statechart formalism with two distinguished features, both being simple and easy to understand, yet powerful enough to model a sufficiently rich class of stochastic decision processes. This is illustrated by a selection of case studies performed using StoCharts. We review the main ingredients of StoCharts and explain different approaches to evaluate QoS requirements satisfied by a collection of StoCharts. In particular we emphasize how a rigid formal semantics makes it possible to employ stochastic model checking to verify QoS requirements.

## DETAILED PROGRAM MONDAY, SEPT 5

|             |  |
|-------------|--|
| 9.00-10.30  | <b>Tutorial 1:</b> Room F313<br><b>Tutorial 2:</b> Room F314<br><b>Verisoft Meeting:</b> Room D239                                     |
| 10.30-11.00 | Coffee Break   |
| 11.00-12.30 | <b>Tutorial 1:</b> Room F313<br><b>Tutorial 2:</b> Room F314<br><b>Verisoft Meeting:</b> Room D239                                     |
| 12.30-14.00 | Lunch  |
| 14.00-15.30 | <b>Tutorial 1:</b> Room F313<br><b>Tutorial 2:</b> Room F314<br><b>Verisoft Meeting:</b> Room D239<br><b>TRain Workshop:</b> Room F413 |
| 15.30-16.00 | Coffee Break   |
| 16.00-17.30 | <b>Tutorial 1:</b> Room F313<br><b>Tutorial 2:</b> Room F314<br><b>Verisoft Meeting:</b> Room D239<br><b>TRain Workshop:</b> Room F413 |
| 19.30       | TRain Workshop Dinner  |

## DETAILED PROGRAM TUESDAY, SEPT 6

|             |  |
|-------------|--|
| 9.00-10.30  | <b>TRain Workshop:</b> Room F413<br><b>Verisoft Meeting:</b> Room D239<br><b>Tutorial 3:</b> Room F313 |
| 10.30-11.00 | Coffee Break   |
| 11.00-12.30 | <b>TRain Workshop:</b> Room F413<br><b>Verisoft Meeting:</b> Room D239<br><b>Tutorial 3:</b> Room F313 |
| 12.30-14.00 | Lunch  |
| 14.00-15.30 | <b>TRain Workshop:</b> Room F413<br><b>Verisoft Meeting:</b> Room D239<br><b>Tutorial 4:</b> Room F313 |
| 15.30-16.00 | Coffee Break   |
| 16.00-17.30 | <b>TRain Workshop:</b> Room F413<br><b>Verisoft Meeting:</b> Room D239<br><b>Tutorial 4:</b> Room F313 |

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Tutorial 1:  
***Building, Combining, and Integrating Decision Procedures for Software Verification***

Tutorial 2:  
***Unified Modeling Language 2.0 - Concepts and Semantics***

Tutorial 3:  
***An Introduction to CSP II B***

Tutorial 4:  
***QoS Modelling and Verification with UML Statecharts***

# DETAILED PROGRAM WEDNESDAY, SEPT 7

|             | Auditorium A   | Auditorium B   |
|-------------|--|--|
| 9.00-9.30   | Opening Session  |  |
| 9.30-10.30  | Invited Talk 1<br><b>WOLFGANG J. PAUL</b><br><i>Towards the Formal Verification of a C0 Compiler: Code Generation and Implementation Correctness</i>   |  |
| 10.30-11.00 | Coffee Break   |  |
| 11.00-12.30 | <b>Session 1A: <i>Testing</i></b><br>Arshad Jhumka, Martin Hiller<br><b><i>Putting Detectors in their Place</i></b><br><br>Mark Trakhtenbrot<br><b><i>Use of Verification Techniques for Testing and Debugging of Complex Reactive Systems</i></b><br><br>Rita Dorofeeva, Khaled El-Fakih, Stephane Maag, Ana Cavalli, Nina Yevtushenko<br><b><i>Experimental Evaluation of FSM-Based Testing Methods</i></b>  | <b>Session 1B: <i>Real-time Systems</i></b><br>Ruggero Lanotte, Andrea Maggiolo-Schettini, Angelo Troina<br><b><i>Timed Automata with Data Structures for Distributed Systems Design and Analysis</i></b><br><br>Xiuli Sun, Jinzhao Wu<br><b><i>Operational Semantics for Real-Time Processes with Action Refinement</i></b><br><br>Biniam Gebremichael, Frits Vaandrager<br><b><i>Specifying Urgency in Timed I/O Automata</i></b>  |
| 12.30-14.00 | Lunch  |  |
| 14.00-15.00 | Invited Talk 2<br><b>DINES BJØRNER</b><br><b><i>A Cloverleaf of Software Engineering</i></b>   |  |
| 15.00-15.30 | Coffee Break   |  |
| 15.30-17.00 | <b>Session 2A: <i>Static Analysis</i></b><br>Gilles Barthe, Mariela Pavlova, Gerardo Schneider<br><b><i>Static Analysis of Memory Consumption Using Program Logics</i></b><br><br>Mahadevan Subramaniam, Jiangfan Shi<br><b><i>Using Graph Dominators to Extract Observable Protocol Contexts</i></b><br><br>Ernesto Wandeler, Jörn Janneck, Edward Lee, Lothar Thiele<br><b><i>Counting Interface Automata and their Application in Static Analysis of Actor Models</i></b> | <b>Session 2B: <i>Requirements and Specification</i></b><br>Frederic Gervais, Marc Frappier, Regine Laleau<br><b><i>Generating Relational Database Transactions from Recursive Functions Defined on EB3 Traces</i></b><br><br>Zsolt Nemeth, Christian Pérez, Thierry Prio<br><b><i>Workflow Enactment Based on a Chemical Metaphor</i></b><br><br>Bart Jacobs, K. Rustan M. Leino, Frank Piessens, Wolfram Schulte<br><b><i>Safe Concurrency for Aggregate Objects with Invariants</i></b> |
| 17.30       | Welcome Reception / Opening International Conference Summer  |  |

## DETAILED PROGRAM THURSDAY, SEPT 8

Auditorium A

Auditorium B

|             |   |  |
|-------------|---|--|
| 9.00-10.00  | Invited Talk 3<br><b>K. RUSTAN M. LEINO</b><br><i>Invariants on Demand</i>  |  |
| 10.00-10.30 | <i>Session 3: Program Verification I</i><br>Thomas Wilson, Savi Maharaj, Robert Clark<br><i>Omnibus Verification Policies</i>                                     |  |
| 10.30-11.00 | Coffee Break  |  |
| 11.00-12.30 | <i>Session 4A: Program Verification II</i><br>Kerry Trentelman<br><i>Proving Correctness of JavaCard DL Tactlets using Bali</i>                                   | <i>Session 4B: True Concurrency</i><br>Jin Naiyong, Jifeng He<br><i>Towards a Truly Concurrent Model for Processes Sharing Resources</i>               |
|             | Holger Grandy, Kurt Stenzel, Wolfgang Reif<br><i>Object Oriented Verification Kernels for Secure Java Applications</i>  | Joseph Kuehn, Charles Lakos, Robert Esser<br><i>A Proposal for Relative Time Petri Nets</i>  |
|             | Ola Olsson, Angela Wallenburg<br><i>Customised Induction Rules for Proving Correctness of Imperative Programs</i>   | Tarek Sadani, Jean-Pierre Courtiat, Pierre de Saqui-Sannes<br><i>From RT-LOTOS to Time Petri Nets: New Foundations for a Verification Platform</i>     |
| 12.30-14.00 | Lunch   |  |
| 14.00-15.00 | The FME Lecture - Invited Talk 4<br><b>ANTHONY HALL</b><br><i>Making Formal Methods Work</i>  |  |
| 15.00-15.30 | Coffee Break  |  |
| 15.30-17.00 | <i>Session 5A: Program Verification III</i><br><br>Thierry Hubert, Claude Marché<br><i>A Case Study of C Source Code Verification: The Schorr-Waite Algorithm</i> | <i>Session 5B: Formal Methods for Maintenance and Change</i><br>Zoltan Pap, Gyula Csopaki, Sarolta Dibuz<br><i>On the Theory of Patching</i>           |
|             | Jan Blech, Lars Gesellensetter, Sabine Glesner<br><i>Formal Verification of Dead Code Elimination in Isabelle/HOL</i>   | Jan Scheffczyk, Uwe Borghoff, Andreas Birk, Johannes Siedersleben<br><i>Pragmatic Consistency Management in Industrial Requirements Specifications</i> |
|             | Hans de Nivelle, Ruzica Piskac<br><i>Verification of a Checker for Priority Queues</i>  | James Welch, David Faitelson, Jim Davies<br><i>Automatic Maintenance of Association Invariants</i>   |
| 17.15       | Excursion: Fortress Ehrenbreitstein   |  |
| 19.00       | Conference Dinner   |  |

## DETAILED PROGRAM FRIDAY, SEPT 9

Auditorium A

Auditorium B

|             |   |   |
|-------------|---|---|
| 9.00-10.00  | Invited Talk 5<br><b>JOSEPH SIFAKIS</b><br><i>A Framework for Component-based Construction</i>  |   |
| 10.00-10.30 | <b>Session 6: Program Verification IV</b><br>Wishnu Prasetya, Ade Azurat, Tanja Vos, Arthur van Leeuwen<br><i>Building Verification Condition Generators by Compositional Extensions</i>    |   |
| 10.30-11.00 | Coffee Break  |   |
| 11.00-12.30 | <b>Session 7A: Abstraction</b><br>Mila Dalla Preda, Roberto Giacobazzi<br><i>Control Code Obfuscation by Abstract Interpretation</i>  | <b>Session 7B: Human-Computer Interaction</b><br>Hui Shi, Robert Ross, John Bateman<br><i>Formalising Control in Robust Spoken Dialogue Systems</i>   |
|             | Marsha Chechik, Arie Gurfinkel, Shiva Nejati<br><i>Stuttering Abstraction for Model Checking</i>  | Anke Dittmar, Peter Forbrig<br><i>A Unified Description Formalism for Complex HCI-Systems</i>   |
|             | Lilia Georgieva, Patrick Maier<br><i>Description Logics for Shape Analysis</i>  | Antonio Cerone, Peter Lindsay, Simon Connelly<br><i>Formal Analysis of Human-Computer Interaction Using Model-checking</i>                            |
| 12.30-14.00 | Lunch   |   |
| 14.00-15.30 | <b>Session 8A: Tools and Practice</b><br>Gareth Carter, Rosemary Monahan, Joseph Morris<br><i>Software Refinement with Perfect Developer</i>  | <b>Session 8B: Component-based Development</b><br>Nabil Hameurlain<br><i>On Compatibility and Behavioural Substitutability of Component Protocols</i> |
|             | Samuel Colin, Dorian Petit, Jerome Rocheteau, Rafael Marcano, Georges Mariano, Vincent Poirriez<br><i>BRILLANT: An Open Source and XML-based Platform for Rigorous Software Development</i> | Walter Mesquita, Augusto Sampaio, Ana C. V. de Melo<br><i>A Strategy for the Formal Composition of Frameworks</i>                                     |
|             | Patrice Chalin<br><i>Logical Foundation of Program Assertions: What do Practitioners Want?</i>  | Dilian Gurov, Marieke Huisman<br><i>Interface Abstraction for Compositional Verification</i>  |
| 15.30-16.00 | Coffee Break  |   |
| 16.00-17.00 | <b>Session 9: Quality of Service</b><br>Dan Hirsch, Emilio Tuosto<br><i>SHReQ: Coordinating Application Level QoS</i>   |   |
|             | Siva Anantharaman, Jing Chen, Gaétan Hains<br><i>A Synchronous Process Calculus for Service Costs</i>   |   |
| 17.00-17.30 | Closing Session   |   |

## INVITED TALKS

DINES BJØRNER, Technical University of Denmark, National University of Singapore  
**A Cloverleaf of Software Engineering**



Dines  
Bjørner

We shall touch upon four issues of software engineering (SE): (1) domain engineering, (2) formal techniques, (3) SE sociology, and (4) academic software architects and, in closing, we shall tie these four strands together. First and second, before software can be designed one must understand its requirements; but before requirements can be formulated one must understand the domain. So we examine the possibility of basing requirements development on first having established models of the (application) domain. We, in an intertwined manner, also touch upon all of these three phases also being done formally, however "lite". Third, despite 35 years of formal methods, the SE industry, maturity-wise still lags far behind that of other engineering disciplines. So we examine why. Finally, in several areas, the medical, architecture, and others, we see that major undertakings are primarily spearheaded by senior academic staff. Professors of medicine perform daily specialised surgery at hospitals. Professors of architecture design new, daring buildings for industry, and professors of civil engineering head the engineering structural design of new, long bridges. So we examine what a similar approach would entail for SE.

WOLFGANG PAUL, Universität des Saarlandes

**Towards the Formal Verification of a C0 Compiler:  
Code Generation and Implementation Correctness**



Wolfgang  
Paul

The mission of the Verisoft project is i) to develop techniques which permit the pervasive formal verification of computer systems consisting of hardware, system software, communication systems and applications, ii) to apply these techniques in industrial context in order to verify prototype systems. The standard programming language used in the Verisoft project is C0; in a nutshell this is Pascal with a C syntax. In the context of the large project we survey the effort towards the development of a formally verified C0 compiler. Mathematically, the obvious interesting questions concern the correctness of the abstract code generation algorithm. But the development of verified software is not a mathematical beauty contest. It is an engineering effort, where all relevant details must be worked out with reasonably small cost. In this talk we therefore put a considerable emphasis on the correctness of the implementation of the code generation algorithm, on the interface to assembler- and machine languages and on avenues towards the automation of large portions of the mechanical proofs.

ANTHONY HALL

## Making Formal Methods Work

Formal methods have been with us since the very start of computing: Turing, Goldstine and von Neumann all recognised the difficulty of writing correct programs and the necessity for a clear, mathematical expression of a program's intended behaviour. In the early days of formal methods, there was a strong emphasis on this notion of proving correctness of a program. Over time the problem has shifted. There has been a steady improvement in programming tools, and each one has claimed that it will make programming so simple that anyone can do it correctly. All these advances have been useful, but the problem of writing correct, trustworthy programs seems as difficult as ever. We have come to realise that the hard problem does not lie in the mechanics of programming. First it was thought to be a matter of design - solved, it was hoped, by the structured programming school. Then it was realised that we needed to do systems analysis. More recently there have been the various schools of user-centred design and the realisation that much of the problem lies in the system requirements or even the business processes that the software is intended to support. At the same time, we have realised that serious software cannot be developed by a linear, document-based process but needs an incremental, iterative and concurrent engineering approach.



Anthony Hall

Formal methods certainly have a role to play in this larger picture of the software development problem, but we need to understand that role and how formal methods fit with other aspects of system development. Over the last few years I have, with colleagues in Praxis, developed critical operational systems in aviation, rail and finance. We have successfully used formal methods to specify and analyse the behaviour of these systems, and in doing so we have developed an overall approach to system development: Correctness by Construction.

Correctness by Construction is founded on some strong principles, but within those principles it is entirely flexible: it does not prescribe particular notations, techniques or development sequences. Its underlying principles are

- carry out development in small, verifiable steps;
- avoid introducing errors by using the most rigorous notations available at every step;
- remove errors as early as possible by rigorous verification of each step.

Formal methods play a role at many stages of this process. Each of these stages presents different problems and current formal methods are a long way from giving us everything we need. I will explain some of the difficulties and suggest some challenges for formal methods research.

This talk is sponsored by Formal Methods Europe.

## INVITED TALKS

K. RUSTAN M. LEINO, Microsoft Research

**Invariants on Demand**

The last decade has displayed a trend for automatic reasoning techniques to operate on demand. Examples of this trend are counterexample-driven predicate refinement, as used in software model checking, and lemmas on demand, as used in automatic theorem proving. In line with this trend, I will in this talk show a technique that combines abstract interpretation and theorem proving, inferring program invariants when the theorem prover cannot proceed without them. (Joint work with Francesco Logozzo.) To motivate the technique, the talk will also include a demo of the Spec# programming system, which makes use of loop-invariant inference, verification-condition generation, and automatic theorem proving to reason about object-oriented programs.

JOSEPH SIFAKIS, VERIMAG

**A Framework for Component-based Construction**

A central idea in systems engineering is that complex systems are built by assembling components. The system construction problem can be formulated as follows. For a given property  $P$ , build a component  $c$  satisfying  $P$ , from a given set of atomic components  $C$  and a set  $GL$  of operators on components. The component  $c$  to be built can be considered as a term of the algebra generated from  $C$  and  $GL$ . We propose an abstract framework for component-based construction, characterized by the following:

- The behavior of atomic components is represented by transition systems.  $GL$  is a set of "glue" operators, which transform sets of components into components.
- For each component, it is possible to separate its behavior from its structure, due to specific properties of glue operators. We present an instance of this framework, which combines two independent classes of glue operators:
- Interaction models, which provide a general mechanism for modeling interactions between components.
- Priority orders, which provide a general mechanism for restricting the behavior of a set of components so as to meet a given safety property. The combination of interaction models and priority orders is expressive enough to encompass heterogeneous interaction and execution. We show that separation between behavior and structure is instrumental for correctness-by-construction. Finally, we discuss new research problems related to a structure-dependent notion of expressiveness.

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**WORDS OF GREETINGS**

Welcome to KI 2005, the 28th German Conference on AI! This series of Conferences on AI evolved from a small workshop, called GWAI, to an international conference. This year again we succeeded in organizing an event with participants from all over the world. The Program Committee received 113 submissions from 22 countries. Each paper was reviewed by three referees; after an intensive discussion in the Program Committee, 29 papers were accepted for publication in the proceedings volume. Besides this, the program includes three outstanding keynote talks by Ian Horrocks (University of Manchester), Luc Steels (University of Brussels and Sony) and Sebastian Thrun (Stanford University), who covers topics like logical foundation, cognitive abilities of multi-agent systems and the DARPA Grand Challenge. KI 2005 also succeeded in presenting two tutorials; many thanks to Joachim Hertzberg, who served as Tutorial Chair. Peter Baumgartner, in his role as a workshop chair, collected 11 workshops from all areas of AI research, which also includes a meeting of the German Priority Program on "Kooperierende Teams mobiler Roboter in dynamischen Umgebungen". Organizing a conference like KI 2005 is not possible without the support of many individuals. I am truly grateful to the local organizers for their hard work and help in making the conference a success: Gerd Beuster, Sibille Burkhardt, Ruth Götten, Vladimir Klebanov, Thomas Kleemann, Jan Murray, Ute Riechert, Oliver Obst, Alex Sinner and Christoph Wernhard. I hope you will enjoy your conference together with the social program and the location right at a place, which stands for confluence: Koblenz.



**Conference Chair  
Ulrich Furbach**

**Ulrich Furbach**

## Sunday, Sept 11

9.00  
9.30

10.00  
Room F239  
10.30 Workshops

11.00  
11.30 Coffee Break

12.00  
Room F239  
12.30 Workshops

13.00  
13.30 Lunch

14.00  
14.30 Tutorial 1  
Room F413  
15.00 Workshops

15.30  
16.00 Coffee Break

16.30 Tutorial 1  
Room F413  
17.00 Workshops

17.30 Fachbereich KI-Leitungssitzung

18.00  
18.30

19.00  
19.30 Barbecue

20.00

## Monday, Sept 12

KI / MATES Opening Session  
Auditorium A

KI Invited Talk  
Sebastian Thrun  
Auditorium A

Coffee Break

KI Session 1  
Robotics 1  
Auditorium A

Lunch

KI Session 2  
Machine Learning 1  
Auditorium A

Coffee Break

KI Session 3  
Diagnosis 1  
Auditorium A

Coffee Break

KI Session 4  
Diagnosis 2  
Auditorium A

Welcome Reception  
afterwards: Squash Tournament

## Tuesday, Sept 13

KI / MATES Joint Invited Talk  
Luc Steels  
Auditorium A

Coffee Break

KI Session 5  
Robotics 2  
Auditorium A

KI Session 6  
Neural Networks  
Auditorium A

Lunch

KI Session 7  
Machine Learning 2  
Auditorium A

Coffee Break

KI Session 8  
Cognitive Modelling/  
Philosophy/Natural  
Language  
Auditorium A

Short Break

MATES Session 2  
"The Shorts"  
Auditorium B

Conference Dinner

## Wednesday, Sept 14

KI Session 9  
Neural Networks 2  
Auditorium A

Coffee Break

KI Session 10 A  
Planning  
Auditorium A

KI Session 10 B  
Knowledge Representation and Reasoning  
Auditorium B

Lunch

KI / TABLEAUX Joint Invited Talk  
Ian Horrocks  
Auditorium A

Coffee Break/End of Conference

MATES Invited Talk  
John-Jules C. Meyer  
Auditorium B

MATES Session 5A System  
Demonstration 1 Aud B

Coffee Break

MATES Session 5B System  
Demonstration 2 Aud B

MATES Session 6 Methodology and Simulation  
Auditorium B

Short Break

MATES Session 7  
Agent Tools and Agent  
Education Auditorium B

Closing of MATES  
Auditorium B

## WORKSHOPS

### Workshop 1

#### Context-Aware Systems and Situation-Sensitive Applications

# Cancelled

Sunday,  
Sept 12  
Room E313

### Workshop 2

#### 19. Workshop Planen, Scheduling und Konfigurieren / Entwerfen (PuK 2005)

Workshop Organizer:  
Dr. Jürgen Sauer, Universität Oldenburg

#### Abstract

The PuK workshop is the regular meeting of the special interest group on planning, scheduling, design and configuration within the AI section of the GI. As in previous years the PuK workshop brings together researchers and practitioners of the areas of planning, scheduling, design and configuration. It provides a forum for the exchange of ideas, evaluations and experiences especially in the use of AI techniques within these application and research areas. However, the communities normally do not overlap and joint meetings are rather rare. Thus the PuK workshop is such a joint meeting and provides the possibility for the exchange of ideas, concepts, and problems between researchers from the areas mentioned.

## Workshop 3

Sunday,  
Sept 12  
Room E314

**Philosophy and Artificial Intelligence**

## Workshop Organizers:

SIG Philosophy & Informatics

Gregor Büchel, FH Köln

Bertin Klein, DFKI

Thomas Roth-Berghofer, DFKI

Ruth Hagengruber, Universität Koblenz

## Abstract

The workshop is aiming to intensify the trans-disciplinary discourse on philosophical foundations of informatics, especially regarding the foundations of Artificial Intelligence. The major goal of the workshop is to bring researchers, scientists from both philosophy and informatics, and representatives from different communities together to explore philosophical positions and to transfer knowledge from one discipline to the other.

## Workshop 4

Sunday,  
Sept 12  
Room E413

**FOnt 2005 - Foundational Aspects of Ontologies**

## Workshop Organizers:

Pascal Hitzler, Universität Karlsruhe

Carsten Lutz, Technische Universität Dresden

Gerd Stumme, Universität Kassel

## Abstract

Representing and reasoning with ontologies is the core technology for the Semantic Web, and is growing in importance in many other areas of Computer Science where structured and hierarchically organized knowledge is of importance. While the need for ontological knowledge representation formalisms for practical applications is abundant, it is apparent that only conceptually and mathematically sound frameworks can provide the means for a significant technological advance in this area.

Indeed, formal and foundational aspects of ontologies are being studied in many application domains in order to serve practical needs. It lies in the nature of such fundamental research that a critical mass of different formal perspectives can generate a cross-fertilization of ideas and applications. We therefore intend to bring together researchers working on foundational aspects of ontologies in different application areas, in order to stimulate an exchange of ideas and methods between the subcommunities. We believe that a significant advance in understanding and establishing sound formal foundations for applied ontology research can this way be made.

## WORKSHOPS

Sunday,  
Sept 12  
Room E414

### Workshop 5

#### Knowledge Engineering und Software Engineering

Workshop Organizers:  
Dietmar Seipel, Universität Würzburg  
Joachim Baumeister, Universität Würzburg

#### Abstract

Intelligent systems have been successfully developed in many domains over the last years. The process of building such systems is based on techniques and tools from the fields of knowledge engineering and software engineering, which have influenced each other. Thus, declarative software engineering techniques have been established in various areas, such as knowledge systems, logic programming, constraint programming, and lately in the context of the Semantic Web. The workshop on Knowledge Engineering and Software Engineering (KESE 2005) wants to bring together researchers and practitioners from the fields of software engineering and artificial intelligence.

Sunday,  
Sept 12  
Room F313

### Workshop 6

#### Text-Based Information Retrieval (TIR-05)

Workshop Organizers:  
Benno Stein, Bauhaus-Universität Weimar  
Sven Meyer zu Eissen, Universität Paderborn

#### Abstract

There are various techniques and methods being used for text-based information retrieval tasks, which stem from different research areas: machine learning algorithms, models from computer linguistics and psychology, paradigms from the field of user interaction and modeling, or algorithms for information visualization. The development of powerful retrieval tools requires the combination of these developments, and in this sense the workshop shall provide a platform that spans the different views and approaches.

## Workshop 7

Sunday,  
Sept 12  
Room F314

**Mixed-Reality als Herausforderung an Bildverstehen und Künstliche Intelligenz**

## Workshop Organizers:

Dietrich Paulus, Universität Koblenz

Bärbel Mertsching, Universität Paderborn

## Abstract

Knowledge representation and use has been a central concern for computer vision since decades. This topic becomes even more important as it is now possible to augment the reality through real-time computer graphics in combination with real-time computer vision. As both disciplines need to cooperate, they also need to agree on common representation schemes for world, objects, functions, actions, etc. Vision and graphics together need the discourse with knowledge representation experts. During the workshop we will communicate these topics between the vision research community, graphics, and the experts on artificial intelligence.

## Workshop 8

**Intelligent Learning and Teaching Systems - Between Knowledge Engineering and Software Engineering for Education**

*Cancelled*

## WORKSHOPS

### Workshop 9

#### From Sensory to Social Presence - Techniques and Architectures for Intelligent Interfaces

*Cancelled*

Sunday, **Workshop 10**

Sept 12

Room D238

#### Jahrestreffen der GI-Fachgruppe Deduktionssysteme (DedSys)

Workshop Organizers:

Arbeitsgruppe Furbach/Beckert, Universität Koblenz:

Christoph Wernhard, Universität Koblenz-Landau

Abstract

Das jährlich stattfindende Deduktionstreffen ist die wichtigste Veranstaltung der GI-Fachgruppe Deduktionssysteme. Es wird abwechselnd von den einzelnen Arbeitsgruppen in Deutschland in Form eines Workshops organisiert und inhaltlich ausgestaltet. Es werden aktuelle Arbeiten und Systeme vorgestellt, wobei der Schwerpunkt bei der lokalen Gruppe liegt. Das Treffen soll auch eine Möglichkeit für den Nachwuchs sein, sich über Aktivitäten im Bereich der Deduktionssysteme zu informieren sowie eigene Ideen einem breiteren Fachpublikum vorzustellen.

Sunday, **Workshop 11**

Sept 12

Room H009

#### Kooperierende Teams mobiler Roboter in dynamischen Umgebungen

Workshop Organizers:

Ansgar Bredenfeld, Fraunhofer Institut für Autonome Intelligente Systeme

Thomas Christaller, Fraunhofer Institut für Autonome Intelligente Systeme

Abstract

Das Themenspektrum des DFG-Schwerpunktprogrammes (SPP-1125) umfasst die Erforschung von Verfahren, Komponenten, Architekturen und Lerntechniken, die für mobile Roboterteams in dynamischen Umgebungen erforderlich sind. Im SPP-1125 werden Forschungsprojekte zu diesen Fragestellungen durchgeführt, deren Ergebnisse anhand von Demonstrationsszenarien im RoboCup erprobt und evaluiert werden. Der Workshop richtet sich an Forschergruppen, die zu den beschriebenen Themenspektrum im Umfeld mobiler Roboter innovative Beiträge vorstellen und diskutieren wollen.

## Tutorial 1

**Techniques in Evolutionary Robotics and Neurodynamics**

Frank Pasemann, Martin Hülse, Steffen Wischmann and Keyan Zahedi

## Abstract

The tutorial provides basic facts about the dynamics of recurrent neural networks and its use for robot control applications. An introduction to evolutionary robotics is given, describing the aims of this approach as well as some basic examples of evolved robot controllers.

Furthermore, the software package ISEE (integrated structure evolution environment) is introduced that provides the implementation of the ENS<sup>3</sup> (evolution of neural systems by stochastic synthesis) algorithm, an interface to control physical simulations and real robots, a tool to analyze activities of recurrent neural networks, and a graphical user interface for online modifications of the evolutionary process. Participants are invited to run their own evolutionary experiments with simulated and real Khepera robots using ISEE.

## Tutorial 2

**Connectionist Knowledge Representation and Reasoning**

Barbara Hammer and Pascal Hitzler

## Abstract

Intelligent systems based on symbolic knowledge processing on the one hand, and on artificial neural networks (also called connectionist systems) on the other, differ substantially. They are both standard approaches to artificial intelligence and it would be very desirable to combine the robust neural networking machinery with symbolic knowledge representation and reasoning paradigms like logic programming in such a way that the strengths of either paradigm will be retained. While significant progress has recently been made on knowledge representation and reasoning using neural networks on the one side and direct processing of symbolic and structured data with neural methods on the other side, the integration of neural computation and expressive logics such as first order logic is still in its early stages of development.

In this tutorial, we will present past achievements and the state of the art in neural-symbolic integration. We believe in the potential of neural-symbolic integration for machine learning applications and for furthering fundamental insights into the working of the human mind. The course thus shall display the importance of neural-symbolic integration as a research area and stimulate discussions and a strengthening of the field.

Sunday,  
Sept 12  
afternoon  
Room E113

Sunday,  
Sept 12  
morning  
Room D239

**DETAILED PROGRAM SUNDAY, SEPT 11**

10.00-11.30 Tutorial 2:  
***Connectionist Knowledge Representation and Reasoning***  
Room D239  
***Workshops***

11.30-12.00 Coffee Break

12.00-13.30 Tutorial 2:  
***Connectionist Knowledge Representation and Reasoning***  
Room D239  
***Workshops***

13.30-14.30 Lunch

14.30-16.00 Tutorial 1:  
***Techniques in Evolutionary Robotics and Neurodynamics***  
Room E113  
***Workshops***

16.00-16.30 Coffee Break

16.30-17.30 Tutorial 1:  
***Techniques in Evolutionary Robotics and Neurodynamics***  
Room E113  
***Workshops***

17.30 Fachbereich KI - Leitungssitzung  
Room D239

18.00 Barbecue

## DETAILED PROGRAM MONDAY, SEPT 12



Auditorium A

9.00-9.30 KI / MATES Opening Session

9.30-10.30 Invited Talk:  
***175 Miles through the Desert***  
SEBASTIAN THRUN, University of Stanford

10.30-11.00 Coffee Break

11.00-12.30 **Session 1: *Robotics 1***  
***Distributed Multi-Robot Localization Based on Mutual Path Detection***  
Vazha Amiranashvili, Gerhard Lakemeyer

***Modeling Moving Objects in a Dynamically Changing Robot Application***  
Martin Lauer, Sascha Lange, Martin Riedmiller

***Heuristic-Based Laser Scan Matching for Outdoor 6D SLAM***  
Andreas Nüchter, Kai Lingemann, Joachim Hertzberg, Hartmut Surmann

12.30-14.00 Lunch

**Session 2: *Machine Learning 1***  
***Design of Geologic Structure Models with Case Based Reasoning***  
Mirjam Minor, Sandro Köppen

***Constrained Linear Regression Models to Predict Interval-valued Data***  
Eufrazio de A. Lima Neto, Francisco de A. T. de Carvalho, Eduarda S. Freire

15.00-15.30 Coffee Break

15.30-16.30 **Session 3: *Diagnosis 1***  
***Development of Flexible and Adaptable Fault Detection and Diagnosis Algorithm for Induction Motors Based on Self-Organization of Feature Extraction***  
Hyeon Bae, Sungshin Kim, Jang-Mok Kim, Kwang-Baek Kim

***Computing the Optimal Action Sequence by Niche Genetic Algorithm***  
Lin Chen, Jie Huang, Zheng-Hu Gong

16.30-17.00 Coffee Break

17.00-18.00 **Session 4: *Diagnosis 2***  
***Diagnosis of Plan Execution and the Executing Agent***  
Nico Roos, Cees Witteveen  
***Automatic Abstraction of Time-Varying System Models for Model Based Diagnosis***  
Pietro Torasso, Gianluca Torta

18.00 Welcome Reception

## DETAILED PROGRAM TUESDAY, SEPT 13

### Auditorium A

9.00-10.00 KI / MATES Joint Invited Talk:  
***Emergent Semantics in Multi-Agent Systems***  
 LUC STEELS, University of Brussels

10.00-10.30 Coffee Break

10.30-11.30 **Session 5: *Robotics 2***  
***A Probabilistic Multimodal Sensor Aggregation Scheme Applied for a Mobile Robot***  
 Erik Schaffernicht, Christian Martin, Andrea Scheidig, Horst-Michael Gross

***Behavior Recognition and Opponent Modeling for Adaptive Table Soccer***  
 Thilo Weigel, Klaus Rechert, Bernhard Nebel

11.30-12.30 **Session 6: *Neural Networks 1***  
***Neuro-Fuzzy Kolmogorov's Network for Time Series Prediction and Pattern Classification***  
 Yevgeniy Bodyanskiy, Vitaliy Kolodyazhniy, Peter Otto

***Design of Optimal Power Distribution Networks Using Multiobjective Genetic Algorithms***  
 Alireza Hadi, Farzan Rashidi

12.30-14.00 Lunch

14.00-15.00 **Session 7: *Machine Learning 2***  
***On Utilizing Stochastic Learning Weak Estimators for Training and Classification of Patterns with Non-Stationary Distributions***  
 B. John Oommen, Luis Rueda

***Noise Robustness by Using Inverse Mutations***  
 Ralf Salomon

15.00-15.30 Coffee Break

15.30-17.00 **Session 8: *Cognitive Modelling / Philosophy / Natural Language***  
***Selecting what is Important: Training Visual Attention***  
 Simone Frintrop, Gerriet Backer, Erich Rome

***Why is the Lucas-Penrose Argument Invalid?***  
 Manfred Kerber

***On the Road to High-Quality POS-Tagging***  
 Stefan Klatt, Karel Oliva

19.00 Conference Dinner

# DETAILED PROGRAM WEDNESDAY, SEPT 14



Auditorium A

Auditorium B

9.00-10.00 **Session 9: *Neural Networks 2***  
***Self-Sustained Thought Processes in a Dense Associative Network***  
 Claudius Gros

***New Stability Results for Delayed Neural Networks***  
 Zhang Qiang

10.00-10.30 Coffee Break

10.30-12.30 **Session 10a: *Planning***  
***Metaheuristics for Late Work Minimization in Two-Machine Flow Shops with Common Due Date***  
 Jacek Blazewicz, Erwin Pesch, Malgorzata Sterna, Frank Werner

***An Optimal Algorithm for Disassembly Scheduling with Assembly Product Structure***  
 Hwa-Joong Kim, Dong-Ho Lee, Paul Xirouchakis

***Hybrid Planning Using Flexible Strategies***  
 Bernd Schatttenberg, Andreas Weigl, Susanne Biundo

***Controlled Reachability Analysis in AI Planning: Theory and Practice***  
 Yacine Zemali

12.30-14.00 Lunch

14.00-15.00 KI / TABLEAUX Joint Invited Talk  
***Description Logics in Ontology Applications***  
 IAN HORROCKS (University of Manchester)

**Session 10b: *Knowledge Representation and Reasoning 2***  
***Dependency Calculus Reasoning in a General Point Relation Algebra***  
 Marco Ragni, Alexander Scivos

***A New n-ary Existential Quantifier in Description Logics***  
 Franz Baader, Eldar Karabaev, Carsten Lutz, Manfred Theißen

***Temporalizing Spatial Calculi***  
 Marco Ragni, Stefan Wöflf

***Subsumption in EL w.r.t. Hybrid TBoxes***  
 Sebastian Brandt, Jörg Model

15.00 Coffee Break - End of Conference

## INVITED TALKS

SEBASTIAN THRUN, Stanford University

**175 Miles Through the Desert**Sebastian  
Thrun

The DARPA Grand Challenge is one of the biggest open challenges for the robotics community to date. It requires a robotic vehicle to follow a given route of up to 175 miles across punishing desert terrain, without any human supervision. The Challenge was first held in 2004, in which the best performing team failed after 7.3 miles of autonomous driving. The speaker heads one out of 195 teams worldwide competing for the 2 Million Dollar prize. Thrun will present the work of the Stanford Racing Team, which is developing an automated car capable of desert driving at up to 50km/h. He will report on research in areas as diverse as computer vision, control, fault-tolerant systems, machine learning, motion planning, data fusion, and 3-D environment modeling.

LUC STEELS, Free University of Brussels

**Emergent Semantics in Multi-Agent Systems**Luc  
Steels

The talk presents recent research showing how a population of distributed autonomous agents might be able to self-organise a communication system without central control nor prior design. The agents engage in situated language games in which they negotiate not only the linguistic conventions they are going to use in their communication but also the underlying ontologies. I will also discuss applications of this techniques for peer-to-peer information exchange.

Joint Invited Talk KI / MATES

IAN HORROCKS, University of Manchester

**Description Logics in Ontology Applications**Ian  
Horrocks

Description Logics (DLs) are a family of logic based knowledge representation formalisms. Although they have a range of applications (e.g., configuration and information integration), they are perhaps best known as the basis for widely used ontology languages such as OWL (now a W3C recommendation). This decision was motivated by a requirement that key inference problems be decidable, and that it should be possible to provide reasoning services to support ontology design and deployment. Such reasoning services are typically provided by highly optimised implementations of tableaux decision procedures. In this talk I will introduce both the logics and decision procedures that underpin modern ontology languages, and the implementation techniques that have enabled state of the art systems to be effective in applications in spite of the high worst case complexity of key inference problems.

Joint Invited Talk KI / TABLEAUX

## DETAILED PROGRAM SUNDAY, SEPT 11

14.30-16.15 ***Doctoral Mentoring (1)***  
Room E114

16.15-16.30 Coffee Break

16.30-18.00 ***Doctoral Mentoring (2)***  
Room E114

18.00 Barbecue

## DETAILED PROGRAM MONDAY, SEPT 12, MORNING

Auditorium B

9.00-9.15 KI / MATES Opening Session (Auditorium A)

9.15-10.15 MATES Invited Talk I

***On the Convergence of Retrieval, Structured Search and Trust in Distributed Systems***

KARL ABERER (EPF Lausanne, Switzerland)

10.15-10.30 Coffee Break

10.30-12.00 **Session 1a: *Workflows and Group Interaction***

***Enacting the Distributed Business Workflows Using BPEL4WS on the Multi-Agent Platform***

L. Guo, Dave Robertson, Yun-Heh Chen-Burger

***BSCA-P: Privacy Preserving Coalition Formation***

Bastian Blankenburg, Matthias Klusch

***Towards Service Coalitions: Coordinating the Commitments in a Workflow***

Jiangbo Dang, Michael N. Huhns

12.00-12.15 Short Break

12.15-12.45 **Session 1b: *Poster Presentations***

***Collaborative Agent-Based Knowledge Support for Empirical and Knowledge-intensive Processes***

Andrea Freßmann, Kerstin Maximini, Rainer Maximini, Thomas Sauer

***Towards an Agent-Based Information System for Third-Party Logistics Provision***

Elfriede Krauth, Hans Moonen, Viara Popova, Martijn Schut

***Experiments in Neo Computation Based on Emergent Programming***

Jean-Pierre Georgé, Marie-Pierre Gleizes, Pierre Glize

***A Framework Based on Multi-Agent Systems for Information Retrieval through Mobile Devices***

Angela Carrillo Ramos, Jérôme Gensel, Marlène Villanova-Oliver, Hervé Martin

***CASCOM: Context-Aware Service Co-ordination in Mobile P2P Environments***

Heikki Helin, Matthias Klusch, Antonio Lopes, Alberto Fernandez, Michael Schumacher, Heiko Schuldt, Federico Bergenti, Ari Kinnunen

12.45-14.00 Lunch

## DETAILED PROGRAM MONDAY, SEPT 12, AFTERNOON

Auditorium B

- 14.00-15.00 MATES Invited Talk II  
***Semantic Methods for Peer-To-Peer Query Routing***  
STEFFEN STAAB (U Koblenz, Germany)
- 15.00-15.15 Coffee Break
- 15.15-16.45 **Session 2: Reasoning about Utility**  
***Modeling Minority Games with BDI Agents – A Case Study***  
Wolfgang Renz, Jan Sudeikat
- A Goal Deliberation Strategy for BDI Agent Systems***  
Alexander Pokahr, Lars Braubach, Winfried Lamersdorf
- Estimating Utility-Functions for Negotiating Agents: Using Conjoint Analysis as an Alternative Approach to Expected Utility Measurement***  
Marc Becker, Hans Czap, Malte Poppensieker, Alexander Stotz
- 16.45-17.00 Short Break
- 17.00-18.15 **Session 3: The Shorts**  
***A Direct Reputation Model for VOs Formation***  
Arturo Avila-Rosas
- Realising Reusable Agent Behaviours with ALPHA***  
R. Collier, R. Ross, G. M. P. O'Hare
- Multi-Agent System Specification Using TCOZ***  
Tim Miller, Peter McBurney
- ABACO, Coordination of Autonomous Entities***  
René Schumann, Jürgen Sauer
- Agent-Based Simulation for Testing Control Software of High Bay Warehouses***  
Cornelia Triebig, Tanja Credner, Peter Fischer, Titus Leskien, Andreas Deppisch, Stefan Landvogt
- 19.00 Welcome Reception

## DETAILED PROGRAM TUESDAY, SEPT 13

Auditorium B

9.00-10.00 MATES/KI Joint Invited Talk  
***Emergent Semantics in Multi-Agent Systems***  
 LUC STEELS  
 (SONY Computer Science Lab Paris and Free University of Brussels)

10.00-10.15 Coffee Break

10.15-12.15 **Session 4: *The Dynamics of Knowledge***  
***Reconciling Agent Ontologies for Web Service Applications***  
 Jingshan Huang, Rosa Laura Zavala Gutiérrez, Benito Mendoza García, Michael N. Huhns

***An Agent-Based Knowledge Acquisition Platform***  
 David Sánchez, David Isern, Antonio Moreno

***An Agent Architecture for Ensuring Quality of Service by Dynamic Capability Certification***  
 Thorsten Scholz, Ingo J. Timm, Rainer Spittel

***Engineering a Multi Agent Platform with Dynamic Semantic Service Discovery and Invocation Capability***  
 Oguz Dikenelli, Özgür Gümüş, Ali Murat Tiryaki, Geylani Kardas

12.15-13.30 Lunch

13.30-14.30 MATES Invited Talk III  
***Programming Cognitive Agents***  
 JOHN-JULES C. MEYER (U Utrecht, The Netherlands)

14.30-15.00 **Session 5a: *System Demonstration I***  
***Nominee for the CIA System Innovation Award 2005: Demonstration of Running Systems; Q&A***

15.00-15.15 Coffee Break

15.15-15.45 **Session 5b: *System Demonstration II***  
***Nominee for the CIA System Innovation Award 2005: Demonstration of running systems; Q&A; Final public voting***

15.45-16.45 **Session 6: *Methodology and Simulation***  
***Towards a Formal Methodology for Designing Multi-Agent Applications***  
 Amira Regayeg, Ahmed Hadj Kacem, Mohamed Jmaiel

***LEADSTO: A Language and Environment for Analysis of Dynamics by SimulaTiOn***  
 Tibor Bosse, Catholijn M. Jonker, Lourens van der Meij, Jan Treur

16.45-17.00 Short Break

17.00-18.00 **Session 7: *Agent Tools and Agent Education***  
***Towards a Distributed Tool Platform Based on Mobile Agents***  
 Kolja Lehmann, Lawrence Cabac, Daniel Moldt, Heiko Rölke

***The Distributed Weighing Problem: A Lesson in Cooperation without Communication***  
 Tibor Bosse, Mark Hoogendoorn, Catholijn M. Jonker

18.00-18.15 Closing of MATES  
 Best Paper Award and System Innovation Award Presentation; Announcement of CIA 2006

19.00 Conference Dinner

KARL ABERER, EPF Lausanne, Switzerland

## On the Convergence of Retrieval, Structured Search and Trust in Distributed Systems

The database and information retrieval communities have long been recognized as being irreconcilable. Today, however, we witness a surprising convergence of the techniques used by both communities in decentralized, large-scale environments. The newly emerging field of reputation-based trust management, borrowing techniques from both communities, best demonstrates this claim. We argue that incomplete knowledge and increasing autonomy of the participating entities are the driving forces behind this convergence, pushing the adoption of probabilistic techniques typically borrowed from an information retrieval context. We argue that using a common probabilistic framework would be an important step in furthering this convergence and enabling a common treatment and analysis of distributed complex systems. We will provide a first sketch of such a framework and illustrate it with examples from our previous work on information retrieval, structured search and trust assessment.

STEFFEN STAAB, U Koblenz, Germany

## Semantic Methods for Peer-To-Peer Query Routing

Knowledge sharing in a virtual organization requires a knowledge life cycle including knowledge provisioning, terminology alignment, determination of resource location, query routing, and query answering. In this talk we focus on the issue of determining a relevant resource in a completely decentralized setting such as necessitated by peer-to-peer knowledge management in virtual organizations. Requirements for this task include, e.g., full autonomy of peers as well as full control over own resources and therefore preclude prominent resource location and query routing schemes such as distributed hash tables. In order to tackle given requirements we use a resource location and query routing approach that exploits social metaphors of topical experts and experts' experts as well as semantic similarity of queries and information sources. The approach has been fully tested in simulation runs and partially implemented in the system Bibster (<http://bibster.semanticweb.org>).

JOHN-JULES C. MEYER, U Utrecht, The Netherlands

## Programming Cognitive Agents

Although there is a lot of theory around about cognitive agents since the seminal work by researchers such as Bratman, Cohen & Levesque, Rao & Georgeff, practice of programming "truly" cognitive agents is still in its infancy. Of course, several architectures have been proposed and even occasionally been implemented, and there is a prospect of many potential applications of agent-based systems, but is there a truly systematic way of programming agents with cognitive / mental attitudes such beliefs, desires, intentions, goals, plans, commitments, emotions...? We believe that for this dedicated agent-oriented languages are needed. A number of these have been developed in the last decade or so. But programming in them is still hard. Is there a methodology for agent-oriented programming? Can one structure agent programs better making use of cognitive notions? And how to verify that an agent program is correct? And how is this combined with programming *multi*-agent systems and agent societies where coordination of these autonomous agents and more generally social notions such as norms seem most important? In this talk a number of these issues will be discussed on the basis of work done in Utrecht around the agent language 3APL.



# Hot

Facts, Topics  
Trends!

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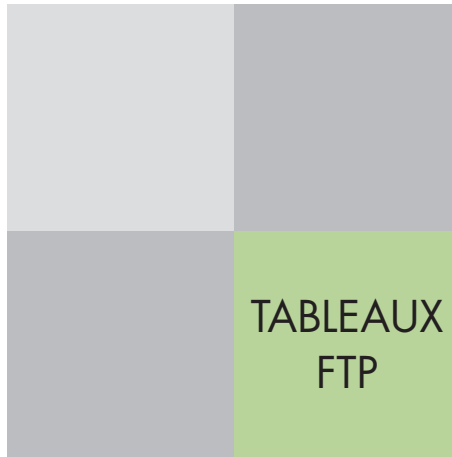
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Bernhard Beckert**

Welcome to Koblenz, the city at the confluence of the Rhine and the Moselle, situated in one of the most beautiful and oldest man-made landscapes. Welcome also to TABLEAUX, the International Conference on Automated Reasoning with Analytic Tableaux and Related Methods. And welcome to FTP, the International Workshop on First-Order Theorem Proving. TABLEAUX is the 14th in a series of international meetings since 1992, and FTP is the 7th since 1997. This year the two events are co-located with closely coordinated programs, which gives you the choice from a broad range of presentations. I wish to sincerely thank all the authors and presenters whose commitment to excellent research makes this an interesting and successful event. And I would like to thank the Program Committee members of both TABLEAUX and FTP, in particular the FTP PC Chair Reinhold Letz, and the other referees for their great effort and professional work in the review and selection process. In addition to the contributed papers, the program includes four excellent keynote talks. I am grateful to Prof. Diego Calvanese, Prof. Ian Horrocks, Prof. Hans Jürgen Ohlbach, and Prof. Erik Rosenthal for accepting the invitation to address the conference. Three very good tutorials are part of the program, and I would like to express my thanks to the tutorial presenters for their contribution. It is a team effort that makes the conference a success. I am truly grateful to the Steering Committee members for their support and to Gernot Stenz for his effective work as Publicity Chair. And I particularly thank the local organizers for their hard work and help in making the conference a success: Gerd Beuster, Gabriele Bommes, Sibille Burkhardt, Ruth Götten, Vladimir Klebanov, Thomas Kleemann, Jan Murray, Oliver Obst, Ute Riechert, Alex Sinner, Christoph Wernhard and Doris Wertz.

Enjoy your conference!

**Bernhard Beckert**

## Wednesday, Sept 14

|       |  |
|-------|--|
| 9.00  |  |
| 9.30  |  |
| 10.00 |  |
| 10.30 |  |
| 11.00 |  |
| 11.30 |  |
| 12.00 |  |
| 12.30 | Lunch  |
| 13.00 |  |
| 13.30 |  |
| 14.00 | Invited Talk<br>Ian Horrocks<br>Auditorium A |
| 14.30 |  |
| 15.00 | Coffee Break                                 |
| 15.30 | Session T1<br>Auditorium A                   |
| 16.00 |  |
| 16.30 |  |
| 17.00 |  |
| 17.30 |  |
| 18.00 | Guided City Tour                             |
| 18.30 |  |
| 19.00 |  |
| 19.30 | Welcome Reception                            |
| 20.00 |  |

## Thursday, Sept 15

|       |   |
|-------|---|
| 9.00  | Invited Talk<br>Diego Calvanese<br>Auditorium A                         |
| 9.30  |   |
| 10.00 | Coffee Break  |
| 10.30 | Session T2<br>Auditorium A  |
| 11.00 | Session F1<br>Auditorium B  |
| 11.30 |   |
| 12.00 |   |
| 12.30 | Lunch   |
| 13.00 |   |
| 13.30 |   |
| 14.00 | Tutorial 1: Room D239<br>Tutorial 2: Room E113<br>Tutorial 3: Room E114 |
| 14.30 |   |
| 15.00 |   |
| 15.30 | Coffee Break  |
| 16.00 | Tutorial 1: Room D239<br>Tutorial 2: Room E113<br>Tutorial 3: Room E114 |
| 16.30 |   |
| 17.00 |   |
| 17.30 |   |
| 18.00 | Excursion:<br>Fortress Ehrenbreitstein                                  |
| 18.30 |   |
| 19.00 |   |
| 19.30 | Conference Dinner   |
| 20.00 |   |

## Friday, Sept 16

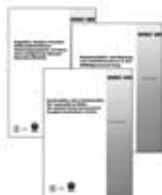
|       |   |
|-------|---|
| 9.00  | Invited Talk<br>Hans Jürgen Ohlbach<br>Auditorium A |
| 9.30  |   |
| 10.00 | Coffee Break  |
| 10.30 | Session T3<br>Auditorium A                          |
| 11.00 | Session F2<br>Auditorium B                          |
| 11.30 |   |
| 12.00 |   |
| 12.30 | Lunch   |
| 13.00 |   |
| 13.30 |   |
| 14.00 | Session T4<br>Auditorium A                          |
| 14.30 | Session F3<br>Auditorium B                          |
| 15.00 |   |
| 15.30 | Coffee Break  |
| 16.00 | Session T5/F4:<br>Auditorium A                      |
| 16.30 |   |
| 17.00 |   |
| 17.30 | TABLEAUX / FTP Business Meeting<br>Auditorium A     |
| 18.00 |   |
| 18.30 |   |
| 19.00 |   |
| 19.30 |   |
| 20.00 |   |

## Saturday, Sept 17

|       |   |
|-------|---|
| 9.00  | Invited Talk<br>Erik Rosenthal<br>Auditorium A              |
| 9.30  |   |
| 10.00 | Coffee Break  |
| 10.30 | Session T6<br>Auditorium A                                  |
| 11.00 | Session F5<br>Auditorium B                                  |
| 11.30 |   |
| 12.00 |   |
| 12.30 | Lunch   |
| 13.00 |   |
| 13.30 |   |
| 14.00 | Session T7/F6<br>Auditorium A                               |
| 14.30 |   |
| 15.00 |   |
| 15.30 |   |
| 16.00 |   |
| 16.30 |   |
| 17.00 |   |
| 17.30 |   |
| 18.00 | Excursion:<br>St. Goar wine festival<br>and Rhine in Flames |
| 18.30 |   |
| 19.00 |   |
| 19.30 |   |
| 20.00 |   |

## Akademische Verlagsgesellschaft Aka GmbH

Die **Akademische Verlagsgesellschaft Aka GmbH** wurde 1996 vom japanischen Verlag Ohmsha und dem niederländischen Verlag IOS Press gegründet, seitdem sind zahlreiche Veröffentlichungen zu den Themen Medizin, Gesundheits- und Sozialwesen, Informatik und Medizininformatik erschienen. Die Fusion mit dem Infix-Verlag im Jahre 1999 markierte einen bedeutenden Zuwachs für Aka.



Aka veröffentlicht zahlreiche Publikationen im Bereich der Künstlichen Intelligenz. Das Programm umfasst neben Tagungsbänden und Monographien auch die Reihe „**Dissertationen zur Künstlichen Intelligenz (DISKI)**“. Die in dieser Reihe erscheinenden Dissertationen geben auf ausgewählten Teilgebieten den aktuellen Stand der Wissenschaft in zusammengefasster Form wieder.

Voraussetzung für die Aufnahme in die Reihe ist eine Bewertung von mindestens „sehr gut“. Die Dissertationen sind in deutscher bzw. englischer Sprache verfasst. Zu den Herausgebern zählen Professoren des Fachbereichs Künstliche Intelligenz an Universitäten in Deutschland, Österreich und der Schweiz. DISKI wird unterstützt vom Fachbereich „Künstliche Intelligenz“ der Gesellschaft für Informatik e.V.

**Wir freuen uns auf Ihren Besuch auf unserem Stand auf der KI2005!**

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Thursday,  
Sept 15  
Room D239

### Tutorial 1

## Instance Based Methods

Peter Baumgartner, Gernot Stenz

### Abstract

The term “instance based methods” (IBM) refers to a family of methods for first-order logic theorem proving. IBMs share the principle of carrying out proof search by maintaining a set of instances of input clauses and analyzing it for satisfiability until completion. IBMs are conceptually essentially different to well established methods like resolution or free-variable analytic tableaux. Also, IBMs exhibit a search space and termination behaviour (in the satisfiable case) different from those methods, which makes them attractive from a practical point of view as a complementary method. This observation is also supported empirically by results obtained with the first serious implementations available (carried out by Letz and Stenz, cf. the system competitions (CASC) at CADE-18 and CADE-19).

The idea behind IBMs is already present in a rudimentary way in the work by Davis, Putnam, Logemann and Loveland in the early sixties. The contemporary stream of research on IBMs was initiated with the Plaisted’s Hyperlinking calculus in 1992. Since then, other methods have been developed by Plaisted and his coworkers. Billon’s disconnection calculus was picked up by Letz and Stenz and has been significantly developed further since then. New methods have also been introduced by Hooker, Baumgartner and Tinelli, and more recently by Ganzinger and Korovin. The stream of publications over the last years demonstrates a growing interest in IBMs. The ideas presented there show that research on IBMs still is in the middle of development, and that there is high potential further improvements and extensions like equality and theory handling, which is currently investigated.

In the tutorial, we will cover the following topics: Early IBMs, the common principle behind IBMs; classification of IBMs (one-level vs. two-level calculi), comparison to resolution and free variable tableaux; selected IBMs in greater detail: ordered semantic hyper linking, the disconnection method, the model evolution calculus; the completeness proof of one selected method; extension to equality reasoning; implementation techniques, particularly the disconnection method.

**Analytic Systems and Dialogue Games**

Chris Fermüller

**Abstract**

Already in the 1950s Paul Lorenzen suggested a two-person dialogue game to serve as a foundation for constructive logics. It took many years before the exact relation between his game and Gentzen's LJ for intuitionistic logic had been clarified; but nowadays a host of similar games and corresponding analytic proof systems for various forms of logics can be found in the literature.

Circumventing the more abstract forms of dialogue games, that have become popular in so-called game semantics for linear logic and functional programming languages, we will discuss Lorenzen's original game and different generalizations of it to explain some more recent applications to the proof theory of intermediate logics and fuzzy logics.

More precisely, our guided tour through the varied landscape of analytic systems and dialogue games will call at vantage points that (hopefully) allow a clear view at the following areas:

- Parallel versions of Lorenzen's game and corresponding hypersequent systems for intermediate logics.
- Dialogue games as models of distributed proof search.
- Model building, "sequents of relations" and a dialogue game for Goedel-Dummett logic.
- Giles's game for Lukasiewicz logic and its relation to recent proof theoretic results in fuzzy logic.

Note that our "tour" is designed to highlight own results. However, we hope that our approach also makes interesting aspects of related work more visible.

Thursday,  
Sept 15  
Room E114

### Tutorial 3

#### Tutorial on Agda

Marcin Benke

##### Abstract

Structured Type Theory is a logical framework in which we can express both programs and proofs. It extends Martin-Löf's type theory by adding modern programming constructs such as local definitions, modules and structures. These additions help to structure the proofs better, as well as a better re-use of code.

The framework is actually a programming language with a strong type system, but also unbounded recursion. A proof in this system is correct if it is type correct, and if it is guaranteed to terminate.

Agda is a type checker and an interpreter for Structured Type Theory, but not only. It has also commands for developing proofs such as filling in holes, checking termination, asking for information, pretty printing etc.

On top of Agda we have two interfaces, one emacs-based interface that we will be used in the tutorial. The other interface, Alfa, is a graphical interface, which provides syntax directed, direct manipulation of proofs and programs.

The tutorial will cover basics of the type theory, proof construction and interaction with Agda, as well as combining interactive and automated proofs.

## DETAILED PROGRAM WEDNESDAY, SEPT 14

### TABLEAUX

Auditorium A

12.30-14.00 Lunch

14.00-15.00 TABLEAUX / KI Joint Invited Talk  
*Description Logics in Ontology Applications*  
IAN HORROCKS

15.00-15.30 Coffee Break

15.30-17.00 Session T1

*Efficient Query Processing with Compiled Knowledge Bases*  
Neil V. Murray, Erik Rosenthal

*An Order-Sorted Quantified Modal Logic for Meta-Ontology*  
Ken Kaneiwa, Riichiro Mizoguchi

*A Tableau Algorithm for Description Logics with Concrete Domains and GCI*  
Carsten Lutz, Maja Milićić

18.00-19.00 Guided City Tour

19.00-20.00 Welcome Reception

DETAILED PROGRAM THURSDAY, SEPT 15

TABLEAUX  
Auditorium A

FTP  
Auditorium B

|             |   |   |
|-------------|---|---|
| 9.00-10.00  | Invited Talk<br><i>Query Processing in Peer-to-Peer Systems: An Epistemic Logic</i><br>DIEGO CALVANESE  |   |
| 10.00-10.30 | Coffee Break  |   |
| 10.30-12.30 | <p>Session T2</p> <p><i>A Calculus for Type Predicates and Type Coercion</i><br/>Martin Giese</p> <p><i>A Redundancy Analysis of Sequent Proofs</i><br/>Tatjana Lutovac, James Harland</p> <p><i>Pdk: The System and its Language (System Description)</i><br/>Marta Cialdea Mayer, Carla Limongelli, Andrea Orlandini, Valentina Poggioni</p> <p><i>The ILTP Library: Benchmarking Automated Theorem Provers for Intuitionistic Logic (System Description)</i><br/>Thomas Rath, Jens Otten, Christoph Kreitz</p> <p><i>Tableau-like Axiomatization for Propositional Linear Temporal Logic (Position Paper)</i><br/>Nikolay Shilov</p> | <p>Session F1</p> <p><i>On Arbitrary Selection Strategies for Basic Superposition</i><br/>Vladimir Aleksic, Anatoli Degtyarev</p> <p><i>Mandatory versus Forbidden Literals in Simplification with Conditional Lemmas</i><br/>Tobias Schmidt-Samoa</p> <p><i>Pushing the SONIC Border (System Description)</i><br/>Anni-Yasmin Turhan</p> |
| 12.30-14.00 | Lunch   |   |
| 14.00-15.30 | <p>Tutorial 1</p> <p><i>Instance Based Methods</i><br/>Peter Baumgartner, Gernot Stenz<br/>Room D239</p> <p>Tutorial 2</p> <p><i>Analytic Systems and Dialogue Games</i><br/>Chris Fermüller<br/>Room E113</p> <p>Tutorial 3</p> <p><i>Tutorial on Agda</i><br/>Marcin Benke<br/>Room E114</p>  | <div style="border: 1px solid green; padding: 10px; text-align: center;"> <p>Tutorials are open to participants of both TABLEAUX and FTP</p> </div>   |
| 15.30-16.00 | Coffee Break  |   |
| 16.00-17.30 | Tutorials 1-3   |   |
| 17.45       | Excursion: Fortress Ehrenbreitstein   |   |
| 19.15       | Conference Dinner   |   |

## DETAILED PROGRAM FRIDAY, SEPT 16, MORNING

### TABLEAUX

Auditorium A

### FTP

Auditorium B

9.00-10.00

Invited Talk

*Automated Reasoning in the Context of the Semantic Web*

HANS JÜRGEN OHLBACH

10.00-10.30

Coffee Break

10.30-12.30

Session T3

*On the Partial Respects in which a Real Valued Arithmetic System Can Verify its Tableaux Consistency*

Dan E. Willard

*A Tableau-Based Decision Procedure for a Fragment of Graph Theory Involving Reachability and Acyclicity*

Domenico Cantone, Calogero G. Zarba

*A Tableau-Based Explainer for DL Subsumption (System Description)*

Thorsten Liebig, Michael Halfmann

*LoTREC: Logical Tableaux Research Engineering Companion (System Description)*

Olivier Gasquet, Andreas Herzig, Dominique Longin, Mohamad Sahade

*A Tableaux Calculus for KLM Preferential and Cumulative Logics (Position Paper)*

Gian Luca Pozzato, Laura Giordano, Valentina Gliozzi, Nicola Olivetti

Session F2

*Tableau Proof Search with Admissible Substitutions*

Boris Konev, Alexander Lyaletski

*A Sound Framework for delta-Rule Variants in Free Variable Semantic Tableaux*

Domenico Cantone, Marianna Nicolosi Asmundo

*On Structural Information and the Experimental Evaluation of SMT Tools (Position Paper)*

Najet Bughanmi, Silvio Ranise, Christophe Ringeissen

12.30-14.00

Lunch

## DETAILED PROGRAM FRIDAY, SEPT 16, AFTERNOON

TABLEAUX  
Auditorium A

FTP  
Auditorium B

14.00-15.30

Session T4

***A Tableau Calculus with Automaton-Labelled Formulae for Regular Grammar Logics***

Rajeev Goré, Linh Anh Nguyen

***A Decision Procedure for the Alternation-free Two-way Modal  $\mu$ -calculus***

Yoshinori Tanabe, Koichi Takahashi, Mitsuharu Yamamoto, Akihiko Tozawa, Masami Hagiya

***A Tableau-based Decision Procedure for Right Propositional Neighborhood Logic***

Davide Bresolin, Angelo Montanari

15.30-16.00

Coffee Break

16.00-17.30

Session T5/F4

***Cyclic Proofs for First-order Logic with Inductive Definitions***

James Brotherston

***Consistency of Variable Splitting in Free Variable Systems of First-order Logic***

Roger Antonsen, Arild Waaler

***The Space Efficiency of OSHL***

Swaha Miller, David A. Plaisted

17.45-18.45

TABLEAUX / FTP Business Meeting

Session F3

***Performance of OSHL on Problems Requiring Definition Expansion***

Swaha Miller, David Plaisted

***A Graph Clausal Logic***

Ricardo Caferra, Rachid Echahed, Nicolas Peltier

## DETAILED PROGRAM SATURDAY, SEPT 17

**TABLEAUX**  
Auditorium A

**FTP**  
Auditorium B

|             |  |
|-------------|--|
| 9.00-10.00  | <p>Invited Talk<br/><b><i>Formal Versus Rigorous Mathematics: How to Get Your Papers Published</i></b><br/>ERIK ROSENTHAL</p>  |
| 10.00-10.30 | Coffee Break   |
| 10.30-12.30 | <p><b>Session T6</b><br/><b><i>Embedding Static Analysis into<br/>Tableaux and Sequent based<br/>Frameworks</i></b><br/>Tobias Gedell</p> <p><b><i>Clausal Connection-Based Theorem<br/>Proving in Intuitionistic First-Order<br/>Logic</i></b><br/>Jens Otten</p> <p><b><i>Proof Output and Transformation for<br/>Disconnection Tableaux (System<br/>Description)</i></b><br/>Philipp Correll, Gernot Stenz</p> <p><b><i>CondLean 3.0: Improving CondLean<br/>for Stronger Conditional Logics<br/>(System Description)</i></b><br/>Nicola Olivetti, Gian Luca Pozzato</p> <p><b><i>A Prolog Tool for Relational<br/>Translation of Modal logics: A Front-<br/>end for Relational Proof Systems<br/>(Position Paper)</i></b><br/>Andrea Formisano, Eugenio Omodeo, Ewa<br/>Orlowska</p> |
| 12.30-14.00 | Lunch  |
| 14.30-15.50 | <p><b>Session T7/F6</b><br/><b><i>On the Dynamic Increase of Multiplicities in Matrix Proof Methods</i></b><br/>Serge Autexier</p> <p><b><i>Comparing Instance Generation Methods for Automated Reasoning</i></b><br/>Swen Jacobs, Uwe Waldmann</p> <p><b><i>Automatic 'Descente Infinie' Induction Reasoning</i></b><br/>Sorin Stratulat</p> <p><b><i>Unit Propagation in a Tableau Framework (System Description)</i></b><br/>Gernot Stenz</p>   |
| 16.15       | Excursion: St. Goar<br>Wine Festival and Rhine in Flames   |

**Session F5**  
***Computation of Normal Logic  
Programs by Fibring Neural Networks***  
Vladimir Komendantsky, Anthony Seda

***On Approximation of Semantic  
Operators of Bilattice-based Logic  
Programs***  
Ekaterina Komendantskaya, Anthony Seda,  
Vladimir Komendantsky

***Representing Strategies for the  
Connection Calculus in Rewriting  
Logic***  
Bjarne Holen, Einar Broch Johnsen, Arild Waaler

## INVITED TALKS

IAN HORROCKS, University of Manchester

**Description Logics in Ontology Applications**

Ian  
Horrocks

Description Logics (DLs) are a family of logic based knowledge representation formalisms. Although they have a range of applications (e.g., configuration and information integration), they are perhaps best known as the basis for widely used ontology languages such as OWL (now a W3C recommendation). This decision was motivated by a requirement that key inference problems be decidable, and that it should be possible to provide reasoning services to support ontology design and deployment. Such reasoning services are typically provided by highly optimised implementations of tableaux decision procedures. In this talk I will introduce both the logics and decision procedures that underpin modern ontology languages, and the implementation techniques that have enabled state of the art systems to be effective in applications in spite of the high worst case complexity of key inference problems.

TABLEAUX / KI Joint Invited Talk

DIEGO CALVANESE, Free University of Bolzano/Bozen

**Query Processing in Peer-to-Peer Systems:  
An Epistemic Logic**

Diego  
Calvanese

In peer-to-peer (P2P) systems, each peer exports information in terms of its own schema, and interoperation is achieved by means of mappings among the peer schemas. Peers are autonomous systems and mappings are dynamically created and changed. One of the challenges in these systems is processing queries posed to one peer taking into account the mappings. Obviously, query processing strongly depends on the semantics of the overall system. In this talk, we overview the various approaches that have been proposed for modeling P2P systems, considering several central properties of such systems, such as modularity, generality, and computational issues related to query processing. We argue that an approach based on epistemic logic is superior with respect to all the above properties to previously proposed approaches based on first-order logic. Specifically, the epistemic logic approach naturally captures the modular nature of P2P systems, and moreover query answering can be performed efficiently (i.e., polynomially) in the size of the data stored in the various peers. This holds independently of the topology of the mappings among peers, and hence respecting one of the fundamental assumptions in P2P systems: namely, that peers are autonomous entities that can establish mappings to other peers without requiring the intervention of any centralized authority.

HANS JÜRGEN OHLBACH, LMU Munich

## Automated Reasoning in the Context of the Semantic Web

"The Semantic Web is specifically a web of machine-readable information whose meaning is well-defined by standards" (Tim Berners-Lee in the foreword of the book "Spinning the Web"). This is a very simplified definition of the Semantic Web. The crucial part is the last word "standards". Since machine readable information in the web can be almost anything, the standards must also be about almost anything. Taken to the extreme, it requires a standardised model of the whole world, physical as well as conceptual, against which the information is interpreted. The world model must contain concrete data, for example the location of my office in Munich, as well as abstract relationships, for example, that an office is a room. In the talk I will sketch key elements of the Semantic Web and try to identify the form and the role of world models. The focus will be on aspects where logic and reasoning comes into play, what form of reasoning is required and how reasoning can be combined with other forms of data processing.



Hans Jürgen  
Ohlbach

ERIK ROSENTHAL, University of New Haven

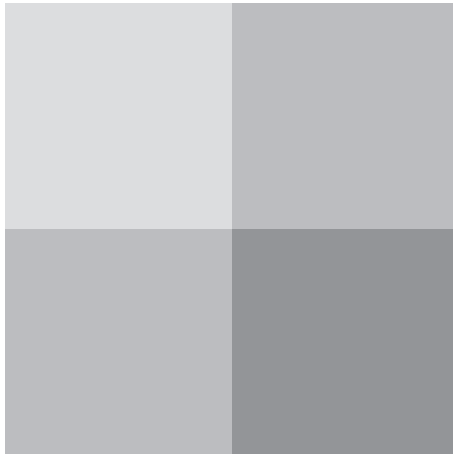
## Formal Versus Rigorous Mathematics: How to Get Your Papers Published

This talk will consider rigorous mathematics and the nature of proof. The talk will begin with a historic perspective and follow the development of formal mathematics. The relationship of formal mathematics to rigorous proof will be explored. The talk will conclude with examples demonstrating that understanding that relationship can assist with both the discovery and the quality of real proofs of real results.



Erik  
Rosenthal

international  
conference  
s u m m e r  
k o b l e n z  
2 0 0 5



AGKI

Universität Koblenz-Landau

<http://www.uni-koblenz.de/ag-ki/confsummer.html>

## ADDRESSES

Conference Venue:  
University Koblenz-Landau  
Campus Koblenz  
Universitätsstraße 1  
56070 Koblenz  
Coordinates: 7°33'32"E, 50°21'47"N

Conference Office:  
Building D  
confsec@uni-koblenz.de  
Tel:+49 261 287 2768  
Fax: +49 261 287 2731

Computer Room:  
Building F, Room F112

Cafeteria:  
Building B, Room B018

Coffee Breaks:  
Building D

Lunch KI, MATES:  
Building D

Lunch SEFM, TABLEAUX, FTP:  
Fährhaus am Stausee/Mosel  
An der Fähre 3  
56072 Koblenz-Metternich  
Coordinates: 7°33'36"E, 50°21'31"N

Conference Dinner KI, MATES:  
Kurfürstliches Schloss  
56068 Koblenz  
Coordinates: 7°36'03"E, 50°21'20"N

Conference Dinner SEFM, TABLEAUX, FTP:  
Kulturfabrik Koblenz  
Mayer-Alberti-Str. 11  
56070 Koblenz  
Coordinates: 7°35'49"E, 50°22'21"N

Welcome Reception SEFM, KI, MATES:  
Building D, Room D239

Welcome Reception TABLEAUX, FTP:  
Schöffenstübchen  
Mittelrheinmuseum  
Florinsmarkt 15  
56068 Koblenz  
Coordinates: 7°35'49"E, 50°21'44"N

## BUS SCHEDULE

### University -> City (Mon-Fri)

| Line | University | Löhrcenter | Zentralplatz | Hauptbahnhof | Line | University | Löhrcenter | Zentralplatz | Hauptbahnhof |
|------|------------|------------|--------------|--------------|------|------------|------------|--------------|--------------|
| 20   | 09:07      | 09:19      |              | 09:23        | 20   | 15:07      | 15:19      |              | 15:23        |
| 3    | 09:11      | 09:19      |              |              | 5    | 15:15      | 15:34      | 15:38        | 15:44        |
| 5    | 09:15      | 09:34      | 09:38        | 09:44        | 3    | 15:23      | 15:31      |              |              |
| 20   | 09:22      | 09:34      |              | 09:38        | 355  | 15:35      | 15:43      |              | 15:46        |
| 20   | 09:37      | 09:49      |              | 09:53        | 20   | 15:37      | 15:49      |              | 15:53        |
| 5    | 09:45      | 10:04      | 10:08        | 10:14        | 5    | 15:45      | 16:04      | 16:08        | 16:14        |
| 3    | 09:53      | 10:01      |              |              | 3    | 15:53      | 16:01      |              |              |
| 20   | 10:07      | 10:19      |              | 10:23        | 15   | 16:02      | 16:19      | 16:23        | 17:14        |
| 5    | 10:15      | 10:34      | 10:38        | 10:44        | 20   | 16:07      | 16:19      |              | 16:23        |
| 3    | 10:23      | 10:31      |              |              | 5    | 16:15      | 16:34      | 16:38        | 16:44        |
| 20   | 10:37      | 10:49      |              | 10:53        | 3    | 16:23      | 16:31      |              |              |
| 5    | 10:45      | 11:04      | 11:08        | 11:14        | 20   | 16:37      | 16:49      |              | 16:53        |
| 3    | 10:53      | 11:01      |              |              | 5    | 16:45      | 17:04      | 17:08        | 17:14        |
| 20   | 11:07      | 11:19      |              | 11:23        | 3    | 16:53      | 17:01      |              |              |
| 5    | 11:15      | 11:34      | 11:38        | 11:44        | 20   | 17:07      | 17:19      |              | 17:23        |
| 3    | 11:23      | 11:31      |              |              | 5    | 17:15      | 17:34      | 17:38        | 17:44        |
| 20   | 11:37      | 11:49      |              | 11:53        | 3    | 17:23      | 17:31      |              |              |
| 5    | 11:45      | 12:04      | 12:08        | 12:14        | 20   | 17:37      | 17:49      |              | 17:53        |
| 3    | 11:53      | 12:01      |              |              | 355  | 17:40      | 17:48      |              | 17:51        |
| 20   | 12:07      | 12:19      |              | 12:23        | 5    | 17:45      | 18:04      | 18:08        | 18:14        |
| 5    | 12:15      | 12:34      | 12:38        | 12:44        | 3    | 17:53      | 18:01      |              |              |
| 3    | 12:23      | 12:31      |              |              | 15   | 18:02      | 18:19      | 18:23        | 18:29        |
| 20   | 12:37      | 12:49      |              | 12:53        | 20   | 18:07      | 18:19      |              | 18:23        |
| 355  | 12:40      | 12:48      |              | 12:51        | 5    | 18:15      | 18:34      | 18:38        | 18:44        |
| 5    | 12:45      | 13:04      | 13:08        | 13:14        | 3    | 18:23      | 18:31      |              |              |
| 3    | 12:53      | 13:01      |              |              | 20   | 18:37      | 18:49      |              | 18:53        |
| 20   | 13:07      | 13:19      |              | 13:23        | 5    | 18:45      | 19:04      | 19:08        | 19:14        |
| 5    | 13:15      | 13:34      | 13:38        | 13:44        | 3    | 18:53      | 19:01      |              |              |
| 3    | 13:23      | 13:31      |              |              | 20   | 19:07      | 19:19      |              | 19:23        |
| 20   | 13:37      | 13:49      |              | 13:53        | 5    | 19:15      | 19:34      | 19:38        | 19:44        |
| 5    | 13:45      | 14:04      | 14:08        | 14:14        | 3    | 19:23      | 19:31      |              |              |
| 3    | 13:53      | 14:01      |              |              | 20   | 19:37      | 19:49      |              | 19:53        |
| 15   | 14:02      | 14:19      | 14:23        | 14:29        | 3    | 19:53      | 20:01      |              |              |
| 20   | 14:07      | 14:19      |              | 14:23        | 5    | 19:54      | 20:19      | 20:23        | 20:29        |
| 5    | 14:15      | 14:34      | 14:38        | 14:44        | 20   | 20:07      | 20:19      |              | 20:23        |
| 3    | 14:23      | 14:31      |              |              | 3    | 20:58      | 21:06      |              | 21:10        |
| 20   | 14:37      | 14:49      |              | 14:53        | 5    | 21:00      | 21:19      | 21:23        | 21:29        |
| 5    | 14:45      | 15:04      | 15:08        | 15:14        | 3    | 21:59      | 22:07      |              | 22:11        |
| 3    | 14:53      | 15:01      |              |              | 5    | 22:00      | 22:19      | 22:23        | 22:29        |

**Note:**

There are different stops for the different bus lines. See the map on the back of this booklet.

## City -> University (Mon-Fri)

| Line | Hauptbahnhof | Zentralplatz | Löhrcenter | University | Line | Hauptbahnhof | Zentralplatz | Löhrcenter | University |
|------|--------------|--------------|------------|------------|------|--------------|--------------|------------|------------|
| 20   | 08:27        |              | 08:32      | 08:42      | 355  | 14:20        |              | 14:24      | 14:31      |
| 3    |              |              | 08:44      | 08:51      | 5    | 14:04        | 14:10        | 14:14      | 14:34      |
| 20   | 08:40        |              | 08:45      | 08:55      | 20   | 14:27        |              | 14:32      | 14:42      |
| 5    | 08:34        | 08:40        | 08:44      | 09:04      | 3    |              |              | 14:54      | 15:01      |
| 20   | 08:57        |              | 09:02      | 09:12      | 5    | 14:34        | 14:40        | 14:44      | 15:04      |
| 3    |              |              | 09:24      | 09:31      | 20   | 14:57        |              | 15:02      | 15:12      |
| 5    | 09:04        | 09:10        | 09:14      | 09:34      | 3    |              |              | 15:24      | 15:31      |
| 20   | 09:27        |              | 09:32      | 09:42      | 5    | 15:04        | 15:10        | 15:14      | 15:34      |
| 20   | 09:40        |              | 09:45      | 09:55      | 20   | 15:27        |              | 15:32      | 15:42      |
| 3    |              |              | 09:54      | 10:01      | 3    |              |              | 15:54      | 16:01      |
| 5    | 09:34        | 09:40        | 09:44      | 10:04      | 5    | 15:34        | 15:40        | 15:44      | 16:04      |
| 20   | 09:57        |              | 10:02      | 10:12      | 20   | 15:57        |              | 16:02      | 16:12      |
| 3    |              |              | 10:24      | 10:31      | 3    |              |              | 16:24      | 16:31      |
| 5    | 10:04        | 10:10        | 10:14      | 10:34      | 355  | 16:20        |              | 16:24      | 16:31      |
| 20   | 10:27        |              | 10:32      | 10:42      | 5    | 16:04        | 16:10        | 16:14      | 16:34      |
| 3    |              |              | 10:54      | 11:01      | 20   | 16:27        |              | 16:32      | 16:42      |
| 5    | 10:34        | 10:40        | 10:44      | 11:04      | 3    |              |              | 16:54      | 17:01      |
| 20   | 10:57        |              | 11:02      | 11:12      | 5    | 16:34        | 16:40        | 16:44      | 17:04      |
| 3    |              |              | 11:24      | 11:31      | 20   | 16:57        |              | 17:02      | 17:12      |
| 355  | 11:20        |              | 11:24      | 11:31      | 3    |              |              | 17:24      | 17:31      |
| 5    | 11:04        | 11:10        | 11:14      | 11:34      | 5    | 17:04        | 17:10        | 17:14      | 17:34      |
| 20   | 11:27        |              | 11:32      | 11:42      | 20   | 17:27        |              | 17:32      | 17:42      |
| 3    |              |              | 11:54      | 12:01      | 3    |              |              | 17:54      | 18:01      |
| 5    | 11:34        | 11:40        | 11:44      | 12:04      | 5    | 17:34        | 17:40        | 17:44      | 18:04      |
| 20   | 11:57        |              | 12:02      | 12:12      | 20   | 17:57        |              | 18:02      | 18:12      |
| 3    |              |              | 12:24      | 12:31      | 3    |              |              | 18:24      | 18:31      |
| 5    | 12:04        | 12:10        | 12:14      | 12:34      | 5    | 18:04        | 18:10        | 18:14      | 18:34      |
| 20   | 12:27        |              | 12:32      | 12:42      | 20   | 18:27        |              | 18:32      | 18:42      |
| 3    |              |              | 12:54      | 13:01      | 3    |              |              | 18:54      | 19:01      |
| 5    | 12:34        | 12:40        | 12:44      | 13:04      | 5    | 18:34        | 18:40        | 18:44      | 19:04      |
| 20   | 12:57        |              | 13:02      | 13:12      | 20   | 18:57        |              | 19:02      | 19:12      |
| 3    |              |              | 13:24      | 13:31      | 3    |              |              | 19:24      | 19:31      |
| 3    | 13:20        |              | 13:25      | 13:32      | 5    | 19:04        | 19:10        | 19:14      | 19:34      |
| 5    | 13:04        | 13:10        | 13:14      | 13:34      | 20   | 19:27        |              | 19:32      | 19:42      |
| 20   | 13:27        |              | 13:32      | 13:42      | 5    | 19:34        | 19:40        | 19:44      | 20:08      |
| 3    |              |              | 13:54      | 14:01      | 20   | 19:57        |              | 20:02      | 20:12      |
| 5    | 13:34        | 13:40        | 13:44      | 14:04      | 3    |              |              | 20:25      | 20:32      |
| 20   | 13:57        |              | 14:02      | 14:12      | 5    | 20:19        | 20:25        | 20:29      | 20:49      |
| 3    |              |              | 14:24      | 14:31      | 3    | 21:20        |              | 21:25      | 21:32      |

**Note:**

There are different stops for the different bus lines. See the map on the back of this booklet.

## BUS SCHEDULE

| City → University (Sat) |              |              |            |            | University → City (Sat) |              |              |            |            |
|-------------------------|--------------|--------------|------------|------------|-------------------------|--------------|--------------|------------|------------|
| Line                    | Hauptbahnhof | Zentralplatz | Löhrcenter | University | Line                    | Hauptbahnhof | Zentralplatz | Löhrcenter | University |
| 3                       |              |              | 08:24      | 08:31      | 5                       | 09:15        | 09:34        | 09:38      | 09:44      |
| 5                       | 08:04        | 08:10        | 08:14      | 08:34      | 3                       | 09:23        | 09:31        |            |            |
| 3                       |              |              | 08:54      | 09:01      | 5                       | 09:45        | 10:04        | 10:08      | 10:14      |
| 5                       | 08:34        | 08:40        | 08:44      | 09:04      | 3                       | 09:53        | 10:01        |            |            |
| 3                       |              |              | 09:24      | 09:31      | 5                       | 10:15        | 10:34        | 10:38      | 10:44      |
| 5                       | 09:04        | 09:10        | 09:14      | 09:34      | 3                       | 10:23        | 10:31        |            |            |
| 3                       |              |              | 09:54      | 10:01      | 5                       | 10:45        | 11:04        | 11:08      | 11:14      |
| 5                       | 09:34        | 09:40        | 09:44      | 10:04      | 3                       | 10:53        | 11:01        |            |            |
| 3                       |              |              | 10:24      | 10:31      | 5                       | 11:15        | 11:34        | 11:38      | 11:44      |
| 5                       | 10:04        | 10:10        | 10:14      | 10:34      | 3                       | 11:23        | 11:31        |            |            |
| 3                       |              |              | 10:54      | 11:01      | 5                       | 11:45        | 12:04        | 12:08      | 12:14      |
| 5                       | 10:34        | 10:40        | 10:44      | 11:04      | 3                       | 11:53        | 12:01        |            |            |
| 3                       |              |              | 11:24      | 11:31      | 5                       | 12:15        | 12:34        | 12:38      | 12:44      |
| 5                       | 11:04        | 11:10        | 11:14      | 11:34      | 3                       | 12:23        | 12:31        |            |            |
| 3                       |              |              | 11:54      | 12:01      | 5                       | 12:45        | 13:04        | 13:08      | 13:14      |
| 5                       | 11:34        | 11:40        | 11:44      | 12:04      | 3                       | 12:53        | 13:01        |            |            |
| 3                       |              |              | 12:24      | 12:31      | 5                       | 13:15        | 13:34        | 13:38      | 13:44      |
| 5                       | 12:04        | 12:10        | 12:14      | 12:34      | 3                       | 13:23        | 13:31        |            |            |
| 3                       |              |              | 12:54      | 13:01      | 5                       | 13:45        | 14:04        | 14:08      | 14:14      |
| 5                       | 12:34        | 12:40        | 12:44      | 13:04      | 3                       | 13:53        | 14:01        |            |            |
| 3                       |              |              | 13:24      | 13:31      | 5                       | 14:15        | 14:34        | 14:38      | 14:44      |
| 5                       | 13:04        | 13:10        | 13:14      | 13:34      | 3                       | 14:23        | 14:31        |            |            |
| 3                       |              |              | 13:54      | 14:01      | 5                       | 14:40        | 15:04        | 15:08      | 15:14      |
| 5                       | 13:34        | 13:40        | 13:44      | 14:04      | 3                       | 14:53        | 15:01        |            |            |
| 3                       |              |              | 14:24      | 14:31      | 5                       | 15:15        | 15:34        | 15:38      | 15:44      |
| 5                       | 14:04        | 14:10        | 14:14      | 14:38      | 3                       | 15:23        | 15:31        |            |            |
| 3                       |              |              | 14:54      | 15:01      | 5                       | 15:45        | 16:04        | 16:08      | 16:14      |
| 5                       | 14:34        | 14:40        | 14:44      | 15:08      | 3                       | 15:53        | 16:01        |            |            |
| 3                       |              |              | 15:24      | 15:31      | 5                       | 16:15        | 16:34        | 16:38      | 16:44      |
| 5                       | 15:04        | 15:10        | 15:14      | 15:38      | 3                       | 16:23        | 16:31        |            |            |

**Note:**

There are different stops for the different bus lines. See the map on the back of this booklet.

## City → University (Sun)

| Line | Hauptbahnhof | Zentralplatz | Löhrcenter | University |
|------|--------------|--------------|------------|------------|
| 3    | 08:50        |              | 08:55      | 09:02      |
| 5    | 08:34        | 08:40        | 08:43      | 09:05      |
| 5    | 09:34        | 09:40        | 09:43      | 10:05      |
| 3    | 10:50        |              | 10:55      | 11:02      |
| 5    | 10:34        | 10:40        | 10:43      | 11:05      |
| 5    | 11:34        | 11:40        | 11:43      | 12:05      |
| 5    | 12:34        | 12:40        | 12:43      | 13:05      |
| 3    |              |              | 12:59      | 13:06      |
| 5    | 13:34        | 13:40        | 13:43      | 14:05      |
| 3    |              |              | 13:59      | 14:06      |
| 5    | 14:04        | 14:10        | 14:13      | 14:35      |
| 5    | 14:34        | 14:40        | 14:43      | 15:05      |
| 3    |              |              | 14:59      | 15:06      |
| 5    | 15:04        | 15:10        | 15:13      | 15:35      |
| 5    | 15:34        | 15:40        | 15:43      | 16:05      |
| 3    |              |              | 15:59      | 16:06      |
| 5    | 16:04        | 16:10        | 16:13      | 16:35      |
| 5    | 16:34        | 16:40        | 16:43      | 17:05      |
| 3    |              |              | 16:59      | 17:06      |
| 5    | 17:04        | 17:10        | 17:13      | 17:35      |
| 5    | 17:34        | 17:40        | 17:43      | 18:05      |
| 3    |              |              | 17:59      | 18:06      |
| 5    | 18:04        | 18:10        | 18:13      | 18:35      |
| 5    | 18:34        | 18:40        | 18:43      | 19:05      |
| 3    |              |              | 18:59      | 19:06      |
| 5    | 19:04        | 19:10        | 19:13      | 19:35      |
| 5    | 19:34        | 19:40        | 19:43      | 20:05      |
| 3    | 20:20        |              | 20:25      | 20:32      |
| 5    | 20:19        | 20:25        | 20:29      | 20:49      |
| 5    | 21:19        | 21:25        | 21:29      | 21:49      |

## University → City (Sun)

| Line | Hauptbahnhof | Zentralplatz | Löhrcenter | University |
|------|--------------|--------------|------------|------------|
| 5    | 09:15        | 09:34        | 09:38      | 09:44      |
| 3    | 09:27        | 09:35        |            |            |
| 5    | 10:15        | 10:34        | 10:38      | 10:44      |
| 5    | 11:10        | 11:34        | 11:38      | 11:44      |
| 3    | 11:27        | 11:35        |            |            |
| 5    | 12:10        | 12:34        | 12:38      | 12:44      |
| 5    | 13:10        | 13:34        | 13:38      | 13:44      |
| 3    | 13:27        | 13:35        |            |            |
| 5    | 13:40        | 14:04        | 14:08      | 14:14      |
| 5    | 14:10        | 14:34        | 14:38      | 14:44      |
| 3    | 14:27        | 14:35        |            |            |
| 5    | 14:40        | 15:04        | 15:08      | 15:14      |
| 5    | 15:10        | 15:34        | 15:38      | 15:44      |
| 3    | 15:27        | 15:35        |            |            |
| 5    | 15:40        | 16:04        | 16:08      | 16:14      |
| 5    | 16:10        | 16:34        | 16:38      | 16:44      |
| 3    | 16:27        | 16:35        |            |            |
| 5    | 16:40        | 17:04        | 17:08      | 17:14      |
| 5    | 17:10        | 17:34        | 17:38      | 17:44      |
| 3    | 17:27        | 17:35        |            |            |
| 5    | 17:45        | 18:04        | 18:08      | 18:14      |
| 5    | 18:15        | 18:34        | 18:38      | 18:44      |
| 3    | 18:27        | 18:35        |            |            |
| 5    | 18:45        | 19:04        | 19:08      | 19:14      |
| 5    | 19:15        | 19:34        | 19:38      | 19:44      |
| 3    | 19:27        | 19:35        |            |            |
| 5    | 20:00        | 20:19        | 20:23      | 20:29      |
| 5    | 21:00        | 21:19        | 21:23      | 21:29      |
| 3    | 21:14        | 20:35        |            |            |
| 5    | 22:00        | 22:19        | 22:23      | 22:29      |

**Note:**

There are different stops for the different bus lines. See the map on the back of this booklet.

## INTERNET ACCESS

Desktop computers with Internet access are available for use in room F112

To log in, use the following username and password:

User name: conference

Password: ics2005

WLAN access is available throughout the university campus. To register your laptop with the WLAN, please connect to the WLAN named tsunami close to the conference office. If you cannot locate the network automatically, you have to specify "tsunami" as the network name. Once you are connected, visit the webpage <http://ki2005.uni-koblenz.de/wlan.html> There you will find details about the procedure for registering your laptop.

Proxy Settings:

It is necessary to use the proxy **cache.uni-koblenz.de:3128** for all internet access.

## ABOUT THE ORGANIZERS

The Artificial Intelligence Research Group at Koblenz University is among the most renowned research groups in Germany in the fields of automated deduction, formal verification, logic programming, and autonomous agents.

Our main topic of research is the development of intelligent software systems. Ultimately, machines should be able to work autonomously in complex environments in order to effectively support users in their decisions and actions. Example applications find relevant information in large amounts of data, or control intelligent robots in real and simulated environments.

### Local Organization Committee

Bernhard Beckert  
Gerd Beuster  
Ulrich Furbach  
Ruth Götten  
Vladimir Klebanov  
Thomas Kleemann  
Jan Murray  
Oliver Obst  
Ute Riechert  
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