
Joint Oberseminar 2008

TITLES AND ABSTRACTS



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1 University of Groningen

1.1 Marco Aiello



The research of Marco Aiello focuses on the notion of space meant as spatial distribution of computation, spatial representation, and spatial reasoning. In the area of distributed systems, his research focuses on Service-Oriented Computing and the issues of service composition, service discovery, transactions with services and services in pervasive environments. *Contact: aiellom@ieee.org*

Title: Service-Oriented Computing: Issues and Open Challenges

Abstract: Service-Oriented Computing is an emerging computing paradigm for building cooperative information systems in which the concepts of distribution, openness, asynchronous messaging and lack of centralized control take a leading role. In this context, applications are built out of individual services that expose functionalities by publishing in appropriate repositories their interfaces, and abstracting entirely from the underlying implementation. The approach has huge potentials for delivering highly dynamic and scalable systems, but at the same time poses a number of challenges to the research community. In this talk, I will overview the area and specifically point to synergies with research in Artificial Intelligence. From the software engineering point of view, I also argue that times are ripe for reducing the amount of traditional programming by taking advantage of Service-Oriented Computing principles.

1.2 Eirini Kaldeli



Eirini Kaldeli research interests include Web Service Composition, Automated Planning, and Constraint Problem Solving.

Title: A constraint-based approach to Web Service Composition

Abstract: In a dynamic environment of heterogeneous web services, the ability to effectually select and integrate existing services in order to realize more complex functionalities opens up new prospects for the development of service oriented applications. Viewing the Web Service

composition problem as a planning task, and presuming a given description of a business domain, our aim is to derive a sequence of actions defined in the abstract process, that achieve some desired goals specified by the user. Based on a modelling of the business process as a state-transition diagram, we formulate the problem as a bounded constraint satisfaction problem, and try to solve it by using standard backtracking search algorithms and constraint propagation techniques.

We propose a state-variable encoding to represent the domain and the user's request, where states and actions are treated as integer variables. We claim that such a representation is expressive enough to capture non-determinism, cycles, reachability and maintainability goals, and some forms of soft constraints (preference goals), while maintaining efficiency by using appropriate heuristics for variable and value ordering. Initial experiments with simple examples indicate that the proposed representation has great potential to effectively deal with these situations. We therefore believe that it can constitute the basis of a system that can altogether, and not only partially, satisfy the core requirements of web service composition: it is domain-independent, can efficiently deal with integer values, incomplete knowledge, and iterative conditional operations, takes into account the non-deterministic behaviour of services, and can support extended goals as well.

1.3 Elie El Khoury

Elie el Khoury is a PhD student at Rijksuniversiteit Groningen, mainly interested in Web service composition and monitoring, and currently working on transaction management in BPEL processes. He is member of the Service Oriented Systems group lead by Marco Aiello.



Title: Transaction Management Integration into BPEL processes

Abstract: Service-Oriented Computing (SOC) is becoming the mainstream development paradigm of applications over the Internet taking advantage of remote independent functionalities. The cornerstone of SOC's success lies in the potential advantage of composing services on the fly. But when the control over the communication and the elements of the information system is low, developing solid systems is challenging. In particular, developing reliable Web service compositions is crucial and usually requires the integration of both composition languages, such as the Business Process Execution Language (BPEL), and coordination protocols, such as WS-Coordination, WS-AtomicTransaction and WS-BusinessActivity. Unfortunately, currently

the composition and coordination aspects of Web Services have separate languages and specifications. We present an approach that overcomes such a limitation by integrating BPEL specifications and Web service coordination protocols, that is, implementing transaction management within service processes.

2 University of Rome „Sapienza”

2.1 Daniele Nardi

Daniele Nardi is currently full Professor at the university of Rome „Sapienza”. His research activity is in the field of Artificial Intelligence and more specifically it is focussed on several aspects of Knowledge Representation and Reasoning and the development of knowledge-based applications. The research topics he is currently interested include: Concept description logics and knowledge based applications, Reasoning about actions and Cognitive Robotics, and Multi Robot Systems. *Contact: nardi@dis.uniroma1.it*



Title: Experiments on contextual reasoning in robotics

Abstract: The need for improving the robustness as well as the ability to adapt to different operational conditions is a key requirement for a wider deployment of robots in many application domains. In this paper we present an approach to the design of robotic systems, that is based on the explicit representation of information about context. The goal of the approach is to improve the system performance, by dynamically tailoring the functionalities of the robot to the specific features of the situation at hand. While the idea of using contextual knowledge is not new, the proposed approach generalizes previous work and its advantages are discussed through a set of case studies. In particular, we identify many attempts to use contextual information in several basic functionalities of a mobile robot such as: behaviors, navigation, exploration, localization, mapping and perception. We then show how re-designing our mobile platform with a common representation of contextual information, leads to interesting improvements in many of the above mentioned components, thus achieving greater flexibility and robustness in the face of different situations. Moreover, a clear separation of contextual knowledge leads to a design methodology, which supports the design of small specialized system components instead of complex self-contained subsystems.

2.2 Daniele Calisi

Daniele Calisi is currently in the second year of the Ph.D course. His main research focus is on robot motion planning, with a particular interest about machine learning applications in this topic. Software frameworks for robot development are also an important part of his past and present works. *Con-*

tact: calisi@dis.uniroma1.it



Title: Motion planning, obstacle avoidance and the use of clothoid curves

Abstract: Motion planning is one of the main topics in mobile robotics and although it has been studied for years, there is no general solution to this problem, due to the variety of scenarios and goals and the computational constraints needed to work online. In this talk we present a survey about the most important motion planning and obstacle avoidance algorithms, addressing their features, limitations and possible improvements. Recently, the introduction of the concept of clothoid, a curve whose curvature varies linearly with its length has led to interesting results in motion planning. Although the math behind this curve is a little bit complicated (its defining formulas are transcendental functions), they have been effectively used in some application (DARPA Grand Challenge, NIST's DEMO II and DEMO III). In this talk we will also discuss a work-in-progress about the possible uses of this kind of curves in fast robot motion planning and reliable obstacle avoidance.

Title: Open-RDK

Abstract: OpenRDK: a modular framework for robotic software development In this talk we conduct an analysis of existing frameworks for robot software development and we present OpenRDK, a modular framework focused on rapid development of distributed robotic systems. It has been designed following users' advice and has been in use within our group for several years. By now OpenRDK has been successfully applied in diverse applications with heterogeneous robots and as we believe it is fruitfully usable by others we are releasing it as open source.

2.3 Alberto Valero



Alberto Valero is currently in his second PhD year. He is working on Human-Robot Interaction in Mobile Robots paying special attention to the multi-robot-multi-user paradigm.

Contact: valero@dis.uniroma1.it

Title: Pro-active Interaction for Semi-autonomous Mobile Robots

Abstract: Abstract Tele-robotics has traditionally followed the master-slave interaction model. New applications for mobile robots require adaptive systems, capable to response to unexpected situations resulting from hazardous environments. In this presentation I will show a novel system that dynamically adjusts the interaction between operators and robots according to the mission requirements. I will describe the overall system paying special attention to the task allocation service. This service allocates the control of the robot between the artificial agents (autonomy) and the operators (tele-operation), being capable of detecting problems derived from autonomy, diagnose the causes, and alert the operator. The system is designed for a multi-robot-multi-user paradigm.

2.4 Stefano Pellegrini

I am working with articulated bodies (especially the human body) tracking and localization from images and image sequences. Lately I have been studying a generalization of ICP to articulated bodies, but now I am moving to tracking by detection. Currently, I am also involved in a project aiming at tracking the human body and at the same time exploit emotional information out of it. *Contact: pellegrinistefano@gmail.com*



Title: A Generalization of the ICP Algorithm for Articulated Bodies

Abstract: The ICP algorithm has been extensively used in the computer vision community for registration and tracking purposes. The original formulation of this method is restricted to the use of non-articulated models. A straightforward generalization to articulated structures is achievable through the joint minimization of all the structure pose parameters, for example using a Levenberg-Marquardt (LM) method. This solution, however, does not exploit the same estimation of the transformation at each iteration that is adopted by the original ICP. Furthermore, this solution heavily suffers from local minima. To overcome this limitation, some authors have extended the straightforward generalization at the cost of giving up some of the properties of the ICP. In this paper, we present a generalization of ICP to articulated structures that maintains all the properties of the original ICP method. In order to achieve this, the key idea is to use the same estimation of the transformation used in the ICP. The experiments show that our method leads to a greater reduction of the residual registration error with respect to a LM based generalization of the ICP.

2.5 Luca Marchetti



Luca Marchetti is currently in the third year of the Ph.D course. His main research focus is on multi-agent data fusion. His work is mainly oriented on distributed methods for state estimation, such as localization and object tracking. *Contact: Luca.Marchetti@dis.uniroma1.it*

Title: Improving data fusion methods with reliability

Abstract: Data fusion algorithms are often designed around optimistic assumption on uncertainty model. Handling with conflicting data, however, require specific strategies, that consider quality of information sources. To improve performance of data fusion systems, the use of reliability, as evaluation of quality of data sources, has been proved to be a promising field of research. In this talk we show how it is possible to use reliability of information source to increase performance of data fusion methods. We present some ideas about the reliability assessment, its role and its use in widely used data fusion algorithm.

2.6 Vittorio Amos Ziparo



Vittorio Amos Ziparo has recently achieved a Ph.D. in Computer Engineering with a dissertation on "Robot teams for multi-objective tasks". His current research interests include: Cognitive and Mobile Robotics, Multi-Agent and Multi-Robot Systems, Petri nets, Game Theory and multi-objective problem solving. *Contact: ziparo@dis.uniroma1.it*

Title: A Formal Model for Representation and Execution of Multi-Robot Plans

Abstract: Petri Net Plans (PNP) are a novel representation framework for high level robot and multi-robot programming, that allows for representing all the action features that are needed for describing complex plans in dynamic environments. We provide a sound and complete execution algorithm for PNPs based on the semantics of Petri nets. Moreover, we show that multi-robot PNPs allow for a sound and complete distributed execution algorithm, given that a reliable communication channel is provided. PNPs have been used for describing effective plans for actual robotic agents which inhabit dynamic, partially observable and unpredictable environments, and

experimented in different application scenarios.

2.7 Luca Iocchi

Luca Iocchi is associate professor at the university of Rome „Sapienza”. His research activity is in the field of Artificial Intelligence and more specifically it is focussed on several aspects of Cognitive Robotics. The research topics he is currently interested include: Multi Robot Systems, Robot Vision, and Stereo-Vision based applications. *Contact: iocchi@dis.uniroma1.it*



Title: Robot Learning: obtaining good results with a few experiments on the real robots

Abstract: Many robotic tasks require fine tuning of the parameters in the implementation of behaviors, of the basic control actions, of the perception routines, as well as of the strategic decisional processes. Machine learning techniques can be effectively used for this purpose, however, when dealing with robotic platforms, both time and hardware consumption are major issues. In this talk, we will present some learning methods that aim at providing good results with a limited number of experiments on the robots: 1) an extension of the policy gradient reinforcement learning algorithm that speeds up convergence; 2) an algorithm for learning by interleaving simulated and real experiments. Experiments on both AIBO quadruped robots and small humanoid robots will be reported.

2.8 Gian Diego Tipaldi

Gian Diego Tipaldi is a third year PhD student in Computer Science with the Department of Computer Science and System Engineering of University of Rome „Sapienza”. His research focuses on probabilistic methods in robotics and machine learning. More specifically, he is interested in robot perception localization and mapping (SLAM) in large and dynamic environment. *Contact: tipaldi@dis.uniroma1.it*



Title: Situation based mapping

Abstract: Up to now, Simultaneous Localization and Mapping (SLAM) has been addressed by two main solutions: filtering and optimization. However, not always the structure of the problem is taken into account. Optimization

methods take some numerical algorithm from “the shelf” and apply it directly to the problem. Filtering approaches often use a Bayesian filter as a “black-box”. Recently, some interest in the problem structure is taking place. However, most of the ideas proposed focus on the sparsity of some matrix and then use some sparse matrix algorithm. In this talk we provide an analysis of the SLAM process, showing the possibility to exploit contextual information for speeding up the estimation process. The purpose of this research line is to devise contextual models of the SLAM process that take into account different situations.

2.9 Matteo Leonetti



Matteo Leonetti is currently in his first months of PhD course. He got started studying automated reasoning, planning and (some) machine learning. *Contact: leonetti@dis.uniroma1.it*

Title: Survey on research issues in robocup legged league

Abstract: The robocup legged league must face many research challenges and every year the rules are changed to make the competition more and more ambitious. In this review I’ll go through SPQR results in the field and I’ll point out the valuable aspects of the league as a research platform in the next future.

3 University of Freiburg

3.1 Bernhard Nebel

Bernhard Nebel received his first degree in Computer Science (Dipl.-Inform.) from the University of Hamburg in 1980 and his Ph.D. (Dr. rer. nat.) from the University of Saarland in 1989. Between 1982 and 1993 he worked on different AI projects at the University of Hamburg, the Technical University of Berlin, ISI/USC, IBM Germany, and the German Research Center for AI (DFKI). From 1993 to 1996 he held an Associate Professor position (C3) at the University of Ulm. Since 1996 he is Professor at Albert-Ludwigs-Universität Freiburg and head of the research group on Foundations of Artificial Intelligence. *Contact: nebel@informatik.uni-freiburg.de*



Title:

Abstract:

3.2 Robert Mattmüller

Robert Mattmüller received a diploma in computer science from the University of Freiburg in March 2006. His research interests include AI Planning and Automatic Verification. *Contact: mattmuel@informatik.uni-freiburg.de*



Title: An Introduction to Timed Games

Abstract: Timed automata are finite automata extended with real-time, which can be used to model the behavior of real-time systems over time. Timed games are games played over timed automata, with one player (typically used to model a controller of an open system) controlling a subset of the transitions and the other player (typically representing the environment) controlling the remaining transitions.

In this talk, we give an introduction to timed games as well as algorithms and tools for their solution, i.e., determining which player possesses a winning strategy in which state. In this context, we will address the related problem of strategy synthesis, i.e., the computation of a winning strategy if one exists.

3.3 Patrick Eyerich



Patrick Eyerich received a diploma in computer science (Diplom-Informatiker) from the University of Freiburg in May 2007. Since May 2007 he has been working in the Research Group on the Foundations of Artificial Intelligence headed by Prof. Dr. Bernhard Nebel *Contact: eyerich@informatik.uni-freiburg.de*

Title: On the Complexity of Planning Operator Subsumption

Abstract: Formal action models play a central role in several subfields of AI because they are used to model application domains, e.g., in automated planning. However, there are hitherto no automated methods for relating such domain models to each other, in particular for checking whether one is a specialization or generalization of the other. In this paper, we introduce a subsumption relation between operators that is suitable for modeling and verifying abstraction hierarchies between actions and operators. We prove complexity results for verifying operator subsumption in three important subclasses: The problem is \mathcal{NP} -complete when the expressiveness of the operators is restricted to the well-known basic STRIPS formalism, Σ_2^P -complete when we admit boolean logical operators and undecidable when the full power of the planning language ADL is permitted.

3.4 Malte Helmert



Malte Helmert received a diploma in computer science (Dipl.-Informatiker) from the University of Freiburg in March 2001. Since April 2001, I am a member of the Research Group on the Foundations of Artificial Intelligence, headed by Prof. Dr. Bernhard Nebel. From April 2001 to March 2003, I was a member of the Graduate Programme "Human and Machine Intelligence". From April 2003 to March 2004, I was a member of the Graduate Programme "Mathematical Logic and Applications". From April 2004 to March 2006, I was a member of the Transregional Collaborative Research Center AVACS. I submitted my PhD dissertation in March 2006 and defended it in June 2006. Between April 2004 and November 2006, I held the position of a teaching assistant and research scientist. Since December 2006, I hold the position of Akademischer Rat (comparable to assistant professor). *Contact: helmert@informatik.uni-freiburg.de*

Title: A Stochastic Local Search Approach to Vertex Cover

Abstract: I will present a novel stochastic local search algorithm for the vertex cover problem. Even though the algorithm is conceptually very simple and requires no fine-tuning of parameters, it is comparable with or even surpasses the state of the art for the vertex cover problem and the related clique and independent set problems. On three very large benchmark instances, the algorithm establishes new records in solution quality.

3.5 Gabi Röger

Gabi Röger is currently in her second PhD year at University of Freiburg. She is interested in action languages and automated planning paying special attention to the integration of both fields. *Contact: roeger@informatik.uni-freiburg.de*



Title: On the Relative Expressiveness of ADL and Golog: The Complete Picture

Abstract: Integrating agent programming languages and efficient action planning is a promising approach because it combines the expressive power of languages such as Golog with the possibility of searching for plans efficiently. In order to integrate a Golog interpreter with a planner, one has to understand, however, which part of the expressiveness of Golog can be captured by the planning language. Using Nebel's compilation framework, we identify a maximal fragment of basic action theories, the formalism Golog is based on, that is expressively equivalent to the ADL subset of PDDL. As we will show, almost all features that permit to specify incomplete information in basic action theories cannot be compiled to ADL.

3.6 Sebastian Kupferschmid

Sebastian Kupferschmid received a diploma in computer science from the University of Freiburg in November 2003. Since then, he is working in the Research Group on the Foundations of Artificial Intelligence at the University of Freiburg. Since January 2004, he is a member of the Transregional Collaborative Research Center AVACS. His research interests lie in the area of heuristic search, action planning, directed model checking and abstraction. While the first two are typical AI topics, the last two stem from the area of model checking. He is currently dealing with how reachability analysis for timed



systems can be accelerated with methods coming from the above mentioned areas. *Contact: kupfersc@informatik.uni-freiburg.de*

Title: Fast Directed Model Checking via Russian Doll Abstraction

Abstract: Directed model checking aims at speeding up the search for bugs in a system through the use of heuristic functions. Such a function maps states to integers, estimating the state's distance to the nearest error state. The search gives a preference to states with lower estimates. The key issue is how to generate good heuristic functions, i.e., functions that guide the search quickly to an error state. An arsenal of heuristic functions has been developed in recent years. Significant progress was made, but many problems still prove to be notoriously hard. In particular, a body of work describes heuristic functions for model checking timed automata in Uppaal, and tested them on a certain set of benchmarks. Into this arsenal we add another heuristic function. With previous heuristics, for the largest of the benchmarks it was only just possible to find some (unnecessarily long) error path. With the new heuristic, we can find provably shortest error paths for these benchmarks in a matter of seconds. The heuristic function is based on a kind of Russian Doll principle, where the heuristic for a given problem arises through using Uppaal itself for the complete exploration of a simplified instance of the same problem. The simplification consists in removing those parts from the problem that are distant from the error property. As our empirical results confirm, this simplification often preserves the characteristic structure leading to the error.

3.7 Michael Brenner



Michael is interested in topics from various subfields of AI, mainly planning, multiagent systems, dialogue systems and human-robot interaction, all of which come together in this talk. Currently he is a full-time dad, though, and thus mainly interacts with his daughter Lilli! *Contact: brenner@informatik.uni-freiburg.de*

Title: A Continual Multiagent Planning Approach to Situated Dialogue

Abstract: Situated dialogue is usually tightly integrated with behaviour

planning, physical action and perception. The talk presents an algorithmic framework, Continual Collaborative Planning (CCP), for modelling this kind of integrated behaviour and shows how CCP agents naturally blend physical and communicative actions. For cross-domain experiments with conversa-

tional CCP agents we have developed MAPSIM, a software environment that can generate multiagent simulations and domain-specific lexica from formal multiagent planning problems automatically. Since no domain-specific programming is needed MAPSIM permits comparison of CCP-based dialogue strategies on a wide range of domains and problems. Despite their linguistic capabilities still being limited (due to the automated nature of our approach) MAPSIM agents can already engage in fairly realistic situated dialogues, as demonstrated by the sample dialogues shown in the talk.

3.8 Alexander Kleiner

I am a member of the Research Group on the Foundations of Artificial Intelligence, headed by Prof. Dr. Bernhard Nebel, and received my PhD from the University of Freiburg in February 2008. My research areas are autonomous robot exploration, simultaneous localization and mapping (SLAM), and multi robot systems, where I mainly focus on solutions based on wireless sensor networks and RFID.



My main concern is on field robotics, i.e. to develop robotic solutions for the support of humans in hostile situations, such as urban search and rescue (US&R). In this context, performance metrics are of topmost importance. Therefore, I spent many of my time on benchmarking and evaluating robot systems. *Contact: kleiner@informatik.uni-freiburg.de*

Title: Multi-Robot Range-Only SLAM by Active Sensor Nodes for Urban Search and Rescue

Abstract: To jointly map an unknown environment with a team of autonomous robots is a challenging problem, particularly in large environments, as for example the devastated area after a disaster. Under such conditions standard methods for Simultaneous Localization And Mapping (SLAM) are difficult to apply due to possible misinterpretations of sensor data, leading to erroneous data association for loop closure. We consider the problem of multi-robot range-only SLAM for robot teams by solving the data association problem with wireless sensor nodes that we designed for this purpose. The memory of these nodes is utilized for the exchange of map data between multiple robots, facilitating loop-closures on jointly generated maps. We introduce RSLAM, which is a variant of FastSlam, extended for range-only measurements and the multi-robot case. Maps are generated from robot odometry and range estimates, which are computed from the RSSI (Received Signal Strength Indication). The proposed method has been extensively tested in USARSim, which serves as basis for the Virtual Robots competition at

RoboCup, and by real-world experiments with a team of mobile robots. The presented results indicates that the approach is capable of building consistent maps in presence of real sensor noise, as well as to improve mapping results of multiple robots by data sharing.

3.9 Christian Dornhege

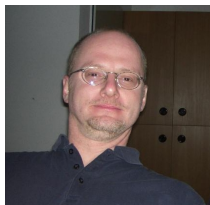


Christian Dornhege received a diploma in computer science (Diplom-Informatiker) from the University of Freiburg in June 2007. Since June 2007 he has been working in the Research Group on the Foundations of Artificial Intelligence headed by Prof. Dr. Bernhard Nebel. *Contact: dornhege@informatik.uni-freiburg.de*

Title: Planning for a manipulator on a mobile robot

Abstract: Probabilistic Roadmap Planning has been successfully applied to the problem of motion planning for manipulators with multiple degrees of freedom. Although the solutions can be used directly for fabrication robots in a known environment there are several issues to be solved for autonomous mobile manipulation, which we will be doing during the TechX challenge. In the talk I will shortly recap how probabilistic roadmap planners work and then address, how we plan to approach autonomous mobile manipulation.

3.10 Stefan Wöfl



Since April 2003, he is member of the Research Group on the Foundations of Artificial Intelligence at the University of Freiburg, headed by Bernhard Nebel. Currently he is working on the SFB/TR 8-project Constraint-Based Reasoning in Qualitative Spatio-Temporal Calculi (LogoSpace). Since June 2004, he is postgraduate member of the DFG-Graduiertenkolleg Mathematical *Contact: woelfl@informatik.uni-freiburg.de*

Title: No talk scheduled

Abstract: No talk scheduled

3.11 Dapeng Zhang

Dapeng Zhang is a member of the Research Group on the Foundations of Artificial Intelligence. He is working on a table soccer robot KiRo. His research topics are imitation learning, learning paradigm etc.. *Contact: zhangd@informatik.uni-freiburg.de*

Title: Tracking the Game Ball of Table Soccer Using Multiple-Model Kalman Filters

Abstract: We developed a table soccer game recorder. The position of the ball is measured by two Laser Measurement Systems, face to face. The raw sensor data are very noisy. Therefore, we developed a sensor fusion method using multiple-model Kalman filters.



3.12 Jan-Georg Smaus

Jan-Georg Smaus has done research in the field of programming languages, logic programming in particular, and in the field of model checking.

In logic programming, the research concerns certain aspects of program verification. Programs that apply dynamic scheduling, i.e., that use an execution model different from the usual left-to-right one, often exhibit some subtle nontermination behaviour. One line of research is to establish conditions that ensure termination and other kinds of correctness for such programs.



In model checking, the research concerns heuristic search to detect errors in timed and hybrid systems. Moreover, Jan-Georg has worked on concise encodings of propositional logic, which are relevant in the context of logical encodings of timed and hybrid systems. *Contact: smaus@informatik.uni-freiburg.de*

Title: Logik und Abstraktion, Verifikation und Falsifikation

Abstract: I will give part of a presentation that forms part of my Habilitation procedure. To make the presentation suitable for the Oberseminar, I will shorten it and speak English, although the slides are in German. I will talk about logic (and to some extent, functional) programming. The first subtopic is verification of logic programs with dynamic scheduling. I will illustrate that for such programs, it is difficult to ensure and prove termination, and mention some solutions. The second subtopic concerns several aspects of type systems.

3.13 Marco Ragni



Marco Ragni is a lecturer (Akademischer Rat) at the Center of Cognitive Science at the University of Freiburg. He received a diploma in mathematics (Dipl.-Mathematiker) from the University of Freiburg in May 2002. He was a research scientist (from July 2002 to January 2008) in the Research Group on the Foundations of Artificial Intelligence at the University of Freiburg headed by Bernhard Nebel. He worked as a member of the Transregional Collaborative Research Center Spatial Cognition in the project Effects of Background Knowledge on Human Spatial Reasoning. He defended his Ph. D. dissertation in January 2008. *Contact: ragni@informatik.uni-freiburg.de*

Title: What the eye tells about the working mind: Eye-movements in spatial reasoning

Abstract: From the very beginning research analyzing human deduction dealt with the question if humans are constructing mental models or using rules to solve reasoning tasks. In this talk I present a new empirical result supporting the theory of mental models.

3.14 Alexander Scivos

Contact: scivos@informatik.uni-freiburg.de

Title: Reasoning about direct and indirect successors in networks **Abstract:**