



JJ := 50

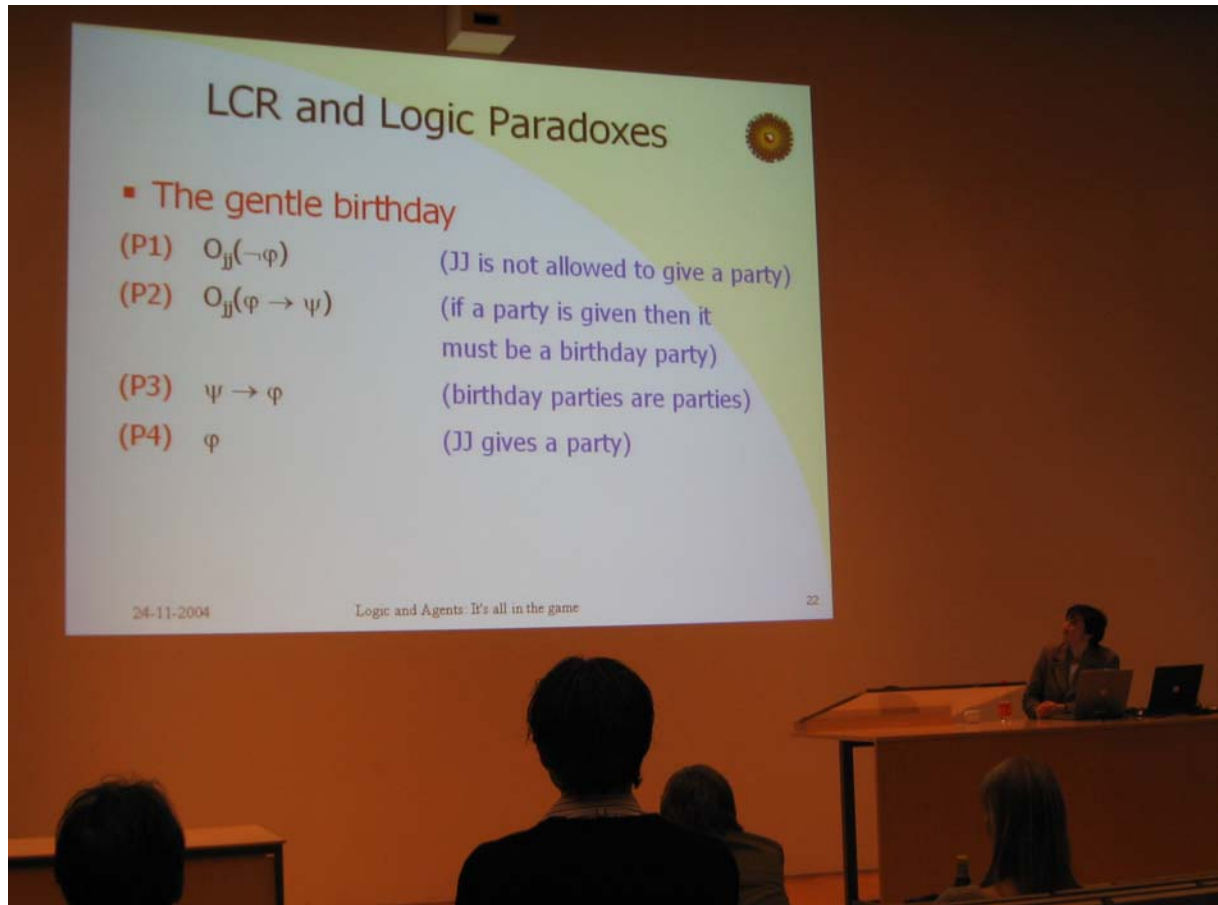
IOP MMI Event

BNAIC 2004

Another Fifty Years

Editor-in-chief

This issue of the BNVKI Newsletter praises the Director of SIKS, Professor John-Jules Ch. Meyer, JJ in short. In honour of his 50th birthday his research group organised a symposium on Logic and Agents, with both a serious and a fun part. It is unclear whether JJ solved the paradox whether he gave a party or not, but what is clear is that he enjoyed it (and so did his co-workers). On behalf of the BNVKI community we wish him another fruitful fifty years.



Is JJ giving a party?

Another symposium, titled *Go at the Frontiers of AI*, was organised on January 26, 2005 by IKAT and SIKS in honour of the Ph.D. defense of Erik van der Werf. As you may guess from its title the symposium concentrated on the state-of-the-art in computer Go. Now that computer Chess has reached in some fifty years world-champion level, Go is a new candidate for the role of *Drosophila Melanogaster* of AI. In a debate, featuring among others Prof. Jacques Pitrat, one of the founding fathers of AI, opinions diverged considering the time span required for computer Go to reach world-champion level. In my opinion this might take another long, but hopefully for AI prosperous, fifty years.

<http://www.cs.unimaas.nl/ikat/gosymposium2005/>

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The photographs in this issue are by courtesy of Javier Vasquez.

Front cover: John-Jules Meyer in different ages and poses.

BNVKI-Board News

Han La Poutré

First of all, the board likes to wish you all the best for the year 2005! We hope that it will be a good year for our AI community.

This year looks very promising and interesting from an AI point of view. Two major BNVKI events will occur: the BNAIC and the BNAIS. The BNAIC will take place in Brussels, at the Free University of Brussels. The exact dates will be determined in the upcoming weeks. Also, a new BNAIS conference will be held, the conference for AI students. After the two very successful BNAIS conferences in Utrecht and Amsterdam, this BNAIS will now be organised by the students of the Radboud University of Nijmegen, in the fall.

In addition, several large international conferences will be held in North-West Europe this year, like the agent conference AAMAS in the Netherlands (Utrecht); the general conference IJCAI, the uncertainty conference UAI and the evolutionary computation conference CEC, all in Scotland (Edinburgh); the machine learning conference ICML in Germany (Bonn); and several other sizable conferences. So, many AI researchers from outside Europe will have an incentive to come and visit these conferences in North-West Europe and (simultaneously) the Netherlands.

So, it looks like that we will have a busy year with meetings, conferences, and guests...

Minutes of the BNVKI-AIABN General Assembly

October 22, 2004

Conference Centre Meerwold, Groningen

Antal van den Bosch

Present: the board of the BNVKI and 23 members

0. Opening

Chairman Han La Poutré opens the meeting at 12:45.

1. Annual report and announcements

La Poutré briefly reviews the main activities of the BNVKI during the past year. In 2004, the BNVKI

oversaw the organization of BNAIC 2004 in Groningen, and initiated the organization of BNAIC 2005.

The chairman also summarizes the board changes. Due to career changes, Floris Wiesman (editor-in-chief of the *BNVKI Newsletter*) and Bas Zinsmeister stepped down. The board is seeking two new members (see point 4). The board has appointed Jos Uiterwijk (Universiteit Maastricht) to replace Wiesman as editor-in-chief.

Furthermore, the board has implemented a cost reducing change in the newsletter distribution. It also has arranged an ISSN number for BNAIC proceedings, and it has sought to formalize the following BNVKI matters and issues:

1. The society's by-laws have been reviewed and changes are proposed (see point 3).
2. A financial framework with scenarios and rules for organizing BNAIC, for future organizers, has been set up, addressing issues such as the financial links with the BNVKI.
3. A protocol for organizing BNAIC has been drafted and is in development, partly using experiences of past organizers.
4. The board is investigating setting up a BNVKI website, optionally to be reused for BNAICs.
5. An inventory of old and potentially new relations to potential sponsors is being drafted.

Niels Taatgen responds that a shared website might be useful for logging registrations and hosting a review system, but a local organizer will need to have full control over the web pages containing the programme and practical information.

Lambert Schomaker provides a summary of the organization of BNAIC 2004, which he labels as "a mixed blessing". The budget risks Schomaker had to take were too high according to Schomaker's financial and judicial advisors; the BNVKI membership fee weighed very heavily on the total budget. Schomaker pointed at a discrepancy of a flat fee of € 40 for all participants, while the official fees of the society distinguish between three categories of members. He also wished more support and flexibility from the BNVKI. He proposed some changes for the BNAIC format. Especially, he argued that the BNAIC should choose to become either a high-quality conference with low acceptance rate, multiple tracks and international ambitions, or a gathering place with a one-track program and just (bi)national focus.

La Poutré responds by noting that the BNVKI has helped by advertising the BNAIC through emailings and the *BNVKI Newsletter*, by advising, by organizing the continuity in the BNAIC and its format, and by “being” the community itself that constitutes most of the participants.

The BNAIC is currently at a balance between having many high-quality papers as well as serving a gathering function. This is possible because of the large overlap between the BNVKI community and the BNAIC participants. The BNVKI community with its sizeable BNAIC conference and frequent *BNVKI Newsletter* is an exception in the two countries. The two main activities reinforce each other.

Tom Heskes remarks that it is hard to view BNAIC as purely a scientific conference, and rather views it as a platform of colleagues, but with a good amount of high-quality work. Van den Herik adds that while BNAIC should strive for being a high-quality scientific conference, its main target remains to be a platform and learning environment for young AI researchers. Also, the close relation between BNAIC and BNVKI through the membership fees is the only way to let both exist, and to keep being a noted member of ECCAI and IJCAI. La Poutré, Denecker, Jonker, Bohte, and others agree.

2. Financial report

Treasurer Cees Witteveen reports good news after two years of bad news: a surplus of € 1650.24. BNVKI secured support from NWO and SIKS. The treasurer’s committee consisting of Pierre-Yves Schobbens and Louis Vuurpijl scrutinized 2004’s balance book and approved it. Two new members of the committee, Annette ten Teije and Marc Gijssens, are proposed and approved by the meeting. Witteveen concludes with the 2005 estimates, which follow the 2004 balance except that the “various” budget is slightly increased due to the foreseen costs involved in setting up a website. A conservative estimate is that in 2005, a surplus of € 290 will be shifted to the reserve capital.

3. New by-laws

Board member Marc Denecker presents the new by-laws of the BNVKI, as published in the previous issue of the newsletter. Reasons for the changes were (1) necessary adaptations to the current state of affairs, (2) adaptations to make the by-laws consistent with the society’s statutes, and (3) corrections of internal inconsistencies. Special attention is paid to a new proposal for electing new

board members. The meeting approves all proposed changes.

4. Election of new board members

The board proposes to include Jos Uiterwijk, editor-in-chief of the newsletter, in the board. With 28 votes for the proposal, 2 against, and one illegal vote, Uiterwijk is elected. For the remaining open position, a vote is cast on two candidates who briefly present their case. With 16 against 14 votes, Edwin de Jong is elected as the second new member of the board.

5. Closing

The meeting is closed at 14:05.

Session Reports BNAIC 2004

In this issue of the *BNVKI Newsletter* we publish the remaining session reports. Five session reports have been published in the October issue.

SESSION 1A: AGENTS I

*Report by Catholijn M. Jonker
Radboud Universiteit Nijmegen*

In Agents I the following papers were presented:

- B. Reggers, F. Wiesman and N. Roos: *Agents for Market-Based Computational-Resource Allocation*
- J. Valk and P. van Tooren: *Multi-Agent Coordination in Dynamic Task Environments*
- P.J. ’t Hoen and S.M. Bohte: *Collective Intelligence with Sequences of Actions*

All three papers were presented in such a way that they inspired the audience to create lively debates on the different topics. A compliment to the speakers!

The paper of Reggers *et al.* is strong in both experimentation and relevance of application with respect to the Internet. The authors compare two market mechanisms for management of shared computational resources: unmediated (Contract Net) and mediated (sealed bid, periodic, uniform-price, double auction). The comparison was done by way of simulation and clearly showed that overhead and gain were quite similar for the two, but that with respect to scalability the mediated one outperformed the unmediated one. Questions ranged from clarification to expected impact.

The paper of Valk and Van Tooren tackles a problem in the important issue of coordination amongst agents working in a dynamic task environment. The authors presented a solution based on task partitioning. The problem, already hard for static task environments, resists optimal planning, especially when agents would retain full autonomy. In their proposal some of the planning autonomy was sacrificed to obtain a fast distributed algorithm to solve the coordination problem. The paper is strong on the theoretical side and relevant with the increased importance of multi-agent systems. The audience got involved in understanding the algorithm and its possibilities and limits.

The paper of 't Hoen and Bohte discusses collective intelligence with sequences of actions. The paper succinctly demonstrates how cooperating agents can interfere with each other, leading to suboptimal results. The authors experimented with a number of simulations to test the effectiveness of the COIN framework for representative token retrieval problems. Different ideas of utility functions were thus compared, with the Wonderful Life Utility the clear winner. The presentation excelled in various illustrations and motivated the audience to think about the problem for themselves. A number of ad hoc attempts were made to come up with alternative solutions, which were neatly countered by the speaker.

SESSION 2A: MACHINE LEARNING II

*Report by Eric Postma
IKAT, Universiteit Maastricht*

The session Machine Learning II consisted of three presentations. The first presentation was given by Egon van den Broek (Free University Amsterdam), the second by Evgueni Smirnov (Universiteit Maastricht), and the third by Sander Bohte (CWI, Amsterdam). The subjects covered ranged from the study of representation (Van den Broek) to reliable and efficient classification (Smirnov and Bohte, respectively).

- *Evaluation of Color Representations for Texture Analysis*, by E.L. van den Broek and E.M. van Rikxoort, NICI, Radboud Universiteit Nijmegen/Vrije Universiteit Amsterdam

Egon van den Broek reported on his study of appropriate colour representations for the analysis of textures in digital images. Many vision researchers have studied methods for texture analysis in grey-level images, but the analysis of coloured texture has been largely ignored. To

evaluate appropriate representations for colour-texture analysis, Van den Broek and Van Rikxoort paired one of six colour-space representations with one of two texture-analysis methods. The six colour-space representations examined were: RGB, HSV, YUV, YIQ, CIE XYZ, and CIE LUV. The two texture-analysis methods were the co-occurrence matrix method and the colour-correlogram method. Van den Broek assessed the effectiveness of the representation-analysis pairs on a texture-classification task. Images taken from the VisTex texture database were transformed according to one of the representation-analysis pairs. Subsequently, three classifiers were trained on the transformed textures and combined by means of majority voting. The main result revealed that colour enhances the classification performance. Therefore, Van den Broek concluded that colour is important for texture classification. In addition, he stated that the combination of texture and colour can be useful for the segmentation of images.

- *Unanimous Voting by Support Vector Machines*, by E.N. Smirnov, I.G. Sprinkhuizen-Kuyper, G.I. Nalbantov, Universiteit Maastricht/Erasmus Universiteit Rotterdam

Evgueni Smirnov discussed how to achieve reliable classification. Comparing the task of a classifier to the task of a physician, he argued that a physician has to generate a reliable diagnosis. In case of insufficient evidence for any diagnosis, the physician should state "I don't know." Smirnov presented a novel reliable classification algorithm called the VSSVM that combines version spaces (VS) and support vector machines (SVM) and that is capable of achieving a performance of 100% classification on accepted ("do know") instances. The basic idea is that only instances that are well-separated instances in the representation space are accepted for classification, while all other ("don't know") instances are not accepted. "Well-separated" is taken to mean: not falling between two hyperplanes in representation space. One of these hyperplanes separates all positive instances from the remaining (don't-know and negative) instances, the other hyperplane separates all negative instances from all others. An experimental evaluation of the VSSVM classifier on seven tasks taken from the UCI ML repository (i.e., Heart-Statlog, Hepatitis, Horse Colic, Ionosphere, Labor, Sonar, and W. Breast Cancer) revealed that it yields a 100% performance on accepted instances on all tasks. Of course, these impressive performances come at a cost in terms of the percentages of rejected (or don't know) instances. These ranged from 15 to 60%. The VSSVM classifier provides a

promising machine-learning approach to problems that require reliable decisions.

- *Nonparametric Classification with Polynomial MPMC Cascades*, S.M. Bohte, M. Breitenbach, and G.Z. Grudic, CWI, Amsterdam/University of Colorado, Boulder, USA

Sander Bohte started his presentation by discussing the minimax probability machine classification (MPMC). The main dilemma in classification is whether or not to use assumptions on the distribution. The MPMC is distribution free and provides an estimate of the future classification performance. The main problem facing MPMCs and many other classifiers (e.g., Support Vector Machines) is that their training and evaluation is computationally very costly. Bohte and his colleagues propose a cascaded extension of the MPMC that reduces the computational cost. Their MPMC cascade does not require parameter tuning, is scalable, and is linear in computing time with respect to the number of data points. Each level in the cascade models the training data by means of low-level polynomials. The MPMC cascade was evaluated (amongst others) on the very large KDD-cup'99 dataset (almost five million 75-dimensional training instances). The polynomial cascaded MPMC yielded a performance of 8.1% error, which compares favourably to the best performance of 7.3% error achieved using a C5 ensemble after three years optimizing. Bohte concluded that the MPMC cascade offers an efficient plug-and-play classifier that is competitive with Gaussian kernel MPMCs and non-linear SVMs.

SESSION 2B: LOGIC IN AI

*Report by Arjen Hommerson
Radboud University Nijmegen*

The topic of the first talk, *Knowledge-Based Asynchronous Programming* by H.W. de Haan, W.H. Hesselink and G.R. Renardel de Lavalette, of this session deals with semantics of knowledge-based programs (KBP). The semantics of a knowledge-based program is problematic, because the meaning of a KBP depends on the knowledge operators for the agents involved, and on the other hand, the meaning of the knowledge operators depends on the meaning of the KBP itself. In the well-known approach of Fagin *et al.*, the definition of the semantics for KBP is not unique. This paper proposes a unique semantics for KBPs in such a way that it allows as much well-justified knowledge as possible without introducing contradictory knowledge. After the presentation of the theory, the semantics was motivated by the *Unexpected Hanging Paradox*.

The second presentation of the Logic in AI session starts off with the question if logic is in fact as universal as being claimed. Bart Verheij argues in his presentation and his paper *Dialectical Argumentation with Argumentation Schemes: an Approach to Legal Logic* that in many realistic cases, such as in the legal field, reasoning is domain-knowledge and as a consequence needs to be modelled for a specific domain. In this paper, he proposes the use of argumentation schemes as the main tool for analysis and introduces a methodology for the investigation of such argumentation schemes. This method consists of the determination of relevant types of sentences, the argumentation schemes, exceptions blocking the use of argumentation schemes and the condition for the use of the argumentation schemes.

The last presentation, *Inductive Situation Calculus*, by Marc Denecker and Eugenia Ternovska and presented by Marc Denecker, shows that it is possible to create an inductive extension of the situation calculus using the Logic for Non-Monotone Inductive Definitions (NMID). A large part of the authors' presentation consists of the various consequences of the application of this logic. The authors show the expressive power, the uniformity and the modularity of the NMID logic. Interestingly, it is also shown that these complex non-monotone definitions occur in various fields which deal with common-sense reasoning, which made the presentation of the NMID logic an excellent addition to the second presentation.

SESSION 2C: COMMUNICATION AND NEGOTIATION

*Report by Frank Dignum
Universiteit Utrecht*

This session contained three presentations of papers that were all published in international conferences before. It indicates right away the high level of the work done in this area in Belgium and The Netherlands. The first presentation was on the paper *Protocol-based Communication for Situated Agents* by Danny Weyns, Elke Steegmans and Tom Holvoet. In this paper they present a way of explicit communication that is a kind of compromise between the type of feromone coordination that is common in situated-agent research and mental-attitudes-based communication as used in the rest of the agent research. The communication is seen as influencing the free-flow decision tree that is used by the agents to determine their next action. A conversation determines the context and the roles of the agent and through those will influence the decision for the next action of the agent. Using this mechanism, no mental model of the agent is

needed, while explicit communication using protocols is supported.

The second presentation of this session was about the paper *Automated Multi-Attribute Negotiation Using Incomplete Preference Information* by Catholijn Jonker and Valentin Robu. The presentation shows how negotiators can use the different utilities that the parties have for the different attributes to get to a good compromise. The main difficulty is to find out the utilities of the other party. Estimates of this utility function can be made based on previous bids. Using these estimations of the utility of the other party leads to substantial better agreements. The approach has been tested using both software agents and human negotiators. In general the software agents managed to get better agreements using this method than their human counterparts.

The final presentation of this session was on the paper *Negotiating over Bundles and Prices Using Aggregate Knowledge* by D. Somefun, Tomas Klos and Han La Poutré. This paper is also about negotiation but differs from the previous one in that it discusses the negotiation of bundles of products. Also in this work the preferences of the other party are estimated. However, in this case it is done by the shop of its customers and based on a classification of that customer using bids of similar customers. While looking at the negotiation process the shop agent will decide to continue trying to reach an agreement on the current bundle or to change to a more promising bundle. Experiments show that this approach is very promising. It should be noted that one needs many customers to use this method though and thus it would not work for small Internet shops with a few dozens of customers.

SESSION 3C: PLANNING

*Report by Floris Wiesman
KIK, University of Amsterdam*

The session on planning was an all-Delft event: the three speakers were from the EWI faculty of TU Delft. All three papers were original (A) papers and all papers addressed the problem that during execution of a plan it may be required that the plan has to be changed.

The first speaker was Jonne Zut, who presented the paper *Multi-Agent Transport Planning* (co-authored by Cees Witteveen). The subject was planning of competitive autonomous agents that carry out time-constrained transportation actions in a shared infrastructure. Previous research has shown that finding optimal conflict-free routes is intractable, but that using heuristics a performance

can be attained that is comparable to human performance. Jonne explained how the existing approach can be extended to an iterative algorithm, such that incidents that occur during plan execution can be dealt with. Two parameters that influence the performance were found.

Roman van der Krogt was the second speaker. He presented the paper *The Two Faces of Plan Repair*, co-authored by Mathijs de Weerdt. Roman explained that plan repair has two faces: the first is to know when and how to remove a part of the plan, and the second is to know when and how to extend a plan. Existing planners use them both. The new heuristic that Roman presented was of the latter kind, and it can be used in conjunction with any planning heuristic.

The third and last speaker was Pieter Buzing, presenting *Distributed (Re)Planning with Preference Information* (co-authored by Cees Witteveen). He presented an agent-based approach to distributed planning problems, which he considered as temporal constraint problems. Pieter showed how information on the preferences of the individual agents can be taken into account. Moreover, he showed how a solution can be repaired when small changes in the preferences are made, thus preventing the need for extensive replanning.

Not surprisingly the talks were well-planned, so the session finished on schedule; there was no need for plan repair.

SESSION 4A: AGENTS II

*Report by Hans Weigand
Tilburg University*

There were two papers from Utrecht: one by Joris Hulstein with Mehdi Dastani, Frank Dignum, and John-Jules Meyer and one paper by Robbert-Jan Beun and Rogier van Eijk. The first one (*Issues in Multiagent System Development*) was a survey of development methodologies for multi-agent systems, with a special eye on the management of norms. The second one (*Ontological Feedback in Multiagent Systems*) was on communication in multi-agent systems and how agents can identify and perhaps repair ontological mismatches by considering the presuppositions of requests.

The third paper in this session (*Analysis of Design Process Dynamics*) by Tibor Bosse, Catholijn M. Jonker, and Jan Treur was presented by Tibor Bosse and reported on a VU project in which design process dynamics are studied by means of an abstract logical representation of these dynamics.

SESSION 4C: COGNITIVE MODELING

*Report by Niels Taatgen
Carnegie Mellon University*

The first talk in this session, *The Natural Input Memory Model*, was by Joyca Lacroix, and concerned a model of list-learning. List-learning is a well-studied and often modeled research paradigm in cognitive psychology, but Lacroix, Murre, Postma and van den Herik have given it a new twist by incorporating perception into the model, something that is usually not taken into consideration. As a consequence, it was able to naturally produce several classical list-learning effects, where other models that do not incorporate perception have to make assumptions about similarity between stimuli. The second talk, *Voice Stress Analysis*, presented by Paul Wiggers, was much more practical in nature. In his project, together with Rothkranz, Van Wees and Van Vark, he examined how the level of stress can be determined on the basic patterns in someone's voice. He found that a high pitch, and a high variability in pitch are indicative of stress. This result can be used in practical applications like aviation, where the automation in an aircraft can adapt itself to stress-levels of the pilot. The final talk of the session, *A Context-based Model of Attention* by Niek Bergboer, together with Postma and Van den Herik, focused on another classic from cognitive psychology: the debate between early and late selection in attention. Their COBA model tries to derive intermediate-level feature representations that are more useful than the low-level features used in early-selection theories (e.g., color and shape). In that way it offers a model that can avoid the problems of both early and late selection.

SESSION 5A: INFORMATION RETRIEVAL

*Report by Antal van den Bosch
Tilburg University*

The ILPS (Information and Language Processing Systems) research group of the Informatics Institute at the University of Amsterdam was fully responsible for an entertaining two-talk session on information retrieval. The first talk, *Type Checking in Open-Domain Question Answering*, by Schlobach, Olsthoorn, and De Rijke, presented earlier at ECAI-2004, dealt with the effect of being able to predict the expected type of answer in a question-answering system. The ILPS people show that multiple answers to the same question could be heuristically filtered or ranked. The best method that attains the best performance (lower than, but reasonably near the score attained through human filtering) is a *knowledge-intensive* filtering method

that uses WordNet synsets as answer types, and which attempts to find a most specific semantic type of which the answer is an instance. If the question reads: "What is the biggest city in the world?" and an answer "Tokio" is found which is known to be a capital, a check in WordNet will reveal that a capital "is a kind of" city, coupling this answer correctly to the question. If the answer would be "Liffey", known to be a river, a check in WordNet will reveal that a river is not a kind of city, by which this answer could be filtered away.

The second presentation, *Length Normalization in XML Retrieval*, by Kamps, De Rijke, and Sigurbjörnsson, focused on XML retrieval, a special area within information retrieval. Length normalization, a well-known issue in IR, is especially relevant in XML retrieval, since the result of retrieval may be any XML element of any length – in contrast with the standard document-retrieval goal where documents tend to have somewhat similar lengths. Results show that combinations of smoothing (to re-estimate the likelihood of very short elements), length priors (to account for the gap between the average element length and the average relevant element length), and index cut-offs leads to the largest improvements in ranking results.

SESSION 5C: ROBOTICS

*Report by Nikos Vlassis
University of Amsterdam*

The BNAIC session *Robotics* took place on Friday 22 October, and it was chaired by Nikos Vlassis (UvA). It included two papers. The first paper was authored by Michel van Darterel, Eric Postma, and Jaap van den Herik from IKAT, Universiteit Maastricht, and it was presented by Michel van Darterel. It was entitled *Categorization through Internal Simulation of Perception and Behaviour*, and it dealt with the *simulation hypothesis* of cognition: that thinking consists of simulated interaction with the environment. A simulated Active Categorical Perception model was developed, in which robots have a neurocontroller with an output-input feedback mechanism that allows them to simulate perception and behaviour internally. The performance of these robots in a categorization task is compared over three experimental conditions in which the output-input feedback mechanism is functional for variable durations. The results show that feedforward-neurocontrolled robots benefit from output-input feedback, while recurrent-neurocontrolled robots do not. In particular the authors conclude that (1) the *simulation hypothesis* may be too specific in a class of problems, and (2) predicting future perception

may depend on neural recurrency (i.e., internal feedback) in general, rather than on the ability to simulate perception by feeding back actions.

The second paper was authored by Wojciech Zajdel, A. Taylan Cemgil, and Ben J.A. Kröse from IAS/ISLA University of Amsterdam, and it was presented by Wojciech Zajdel. It was entitled *Online Multicamera Tracking with a Switching State-Space Model*, and it dealt with the problem of visual tracking in wide areas, like airports or motorways, when a network of cameras is employed. A key challenge in such problems is the (re-)identification of an object (e.g., a person or a car) when it appears at some camera. Unlike in single-view tracking, the identification cannot rely on smooth motion due to discontinuity in the observable area. A method was described that relies on appearance similarities and motion constraints imposed by the topology of camera locations. The method identifies every object with a hidden discrete label, and assumes that the appearance features of objects are generated from a mixture model, where each mixture component corresponds to a single object. Since the number of objects is unknown (and possibly unlimited), the considered method applies the so-called Infinite Mixture Model. It allows recovering identities with Bayesian inference on the labels. For inference, an efficient on-line assumed-density filtering algorithm was proposed and tested by tracking people in a real-world office environment.

SESSION 6B: MACHINE LEARNING IV

*Report by Tom Heskes
Radboud University Nijmegen*

This session contained three excellent presentations: two A papers nominated for best paper award and one B paper from last-year's winner of that same award.

Stefan Raeymaekers presented a joint paper (*Parameterless Information Extraction using (k,l)-Contextual Tree Languages*) with Maurice Bruynooghe on a wrapper induction algorithm that is able to learn from positive examples only. The specific application in mind concerns the extraction of information from structured documents such as HTML and XML pages. They show that, although it is impossible to learn regular languages from positive examples only, it is possible to learn a so-called (k,l) -contextual tree language from positive examples only. A (k,l) -contextual tree language is a subclass of regular unranked tree languages. The parameters k and l refer to the depth and width of the context used to recognize a target field. They present a method to estimate these parameters from

a training set, basically such as to optimize the F1 score in a precision-recall setting. In experiments the obtained algorithm compares favorably with recently derived alternatives based on languages of similar complexity.

Antal van den Bosch (*Wrapped Progressive Sampling Search for Optimizing Learning Algorithm Parameters*) presented a new method, called wrapped progressive sampling, for optimizing higher-level parameters of machine-learning algorithms. The *wrapping* here refers to separating the available data in training and test data and applying cross-validation to estimate the generalization performance for different parameter settings. *Progressive* because the algorithms are trained and tested on larger and larger sets, such that many parameter settings can be excluded with relatively low computational efforts early on. Extensive test with various machine-learning algorithms on ten UCI benchmarks reveal significant performance improvements over alternative approaches.

Edwin de Jong presented a joint paper (*Exploiting Modularity, Hierarchy, and Repetition in Variable-Length Problems*) with Dirk Thierens that appeared in the Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-04). Their higher-level goal is to design evolutionary algorithms such that they can exploit dependencies in optimization problems. Examples of these are modularity, hierarchy, and repetition. In this particular paper they consider several test problems to explore whether these problem features can be identified in isolation (other test problems typically contain a combination of those). They developed a variable-length algorithm capable of forming modules and show that this algorithm indeed finds the modules that one would expect and hence yields significant performance improvements.

SESSION 6C: AI IN LAW AND MEDICINE

*Report by Silja Renooij
Utrecht University*

In the AI in Law and Medicine session, one short paper and two full papers were presented. The application domains in these papers were even more diverse than suggested by the title of the session: e-contracting, veterinary medicine, and human medicine.

The first speaker was Lai Xu (Computer Science, VU). She discussed in her paper *Pro-active Monitoring of Electronic Contracts*, co-authored by Jeusfeld, formalising business contracts for automated processing. The main purpose is to

enable (pro-active) monitoring of contracts between more than two business partners: detect contract violations and the responsible partner, and, more importantly, predicting and preventing imminent contract violations. The presented ideas were illustrated using a case study where several parties are involved in handling a damaged car: the emergency service, the garage, the insurance company, and some intermediary.

The second speaker, Petra Geenen (Information and Computing Sciences, UU), demonstrated in her paper *Building Naïve Bayesian Classifiers from Literature: a Case Study in Classical Swine Fever*, co-authored by Van der Gaag, Elbers and Loeffen, that classifiers, usually learned from data, can be successfully constructed using information from literature. Classifiers were built for the domain of Classical Swine Fever, where the purpose of the classifier is to distinguish between herds with and without the disease, based on a set of features. From the domain of application, three disjunctive rules are known which classify herds to have the disease based on the presence of one or more of a small set of features. Using a dataset, the performance of these rules was compared against a classifier modelling all features mentioned in the data and a selective classifier modelling a subset of these features. For the latter model features had been automatically selected using the mutual information criterion.

The last speaker was Arjen Hommersom (Information and Knowledge Systems, RU). He presented in his paper *Logic and the Quality of Medical Guidelines*, co-authored by Lucas and Balser, a semi-automatic method for checking the quality of medical guidelines using a theorem prover. The main concern is the meta-level quality of guidelines, that is, investigating whether a guideline adheres to some set of general properties such as precluding the prescription of redundant drugs. Arjen argued that this type of quality checking can support the process of (re)designing medical guidelines, thereby enabling faster implementation of guidelines in medical practice and ensuring that the guidelines remain up-to-date.

SESSION 7B: KNOWLEDGE TECHNOLOGY AND UNCERTAINTY

*Report by Marc Denecker
Department Computer Science, K.U. Leuven*

Janneke Bolt presented in the first talk titled *On the Convergence Error in Loopy Propagation* (with Linda van der Gaag) an error analysis of Pearl's propagation algorithm for Bayesian networks. It is well-known that computing probability distributions

from a Bayesian network is NP-hard. For certain network topologies however, efficient algorithms have been developed. In particular, Pearl developed such an algorithm for singly-connected networks, i.e., acyclic networks in which there is at most one path between any pair of variables. Although Pearl's algorithm is only correct in the context of such singly-connected networks, it turned out that the algorithm can be applied for arbitrary networks and in practice produces very good approximations of the correct distribution. In their paper, Bolt and van der Gaag study the cause and size of the error of the *loopy propagation* algorithm, that is Pearl's algorithm in the context of arbitrary Bayesian networks. They identify two types of errors, termed the cycling error and the convergence error and show that the convergence error in a node depends on the degree of dependence between different parents of the node. Their analysis leads to improved insight in the performance of the algorithm.

The second talk *Towards a Structured Analysis of Approximate Problem Solving: a Case Study in Classification* was based on a paper by Groot, Ten Teije and Van Harmelen that was presented originally at KR2004, the Conference of Principles of Knowledge Representation and Reasoning in Whistler, June 2004. The talk was given by Perry Groot. The work is a study of the use of approximate-reasoning methods in the context of classification. Given a domain theory and the definition of a set of classes, the goal of the classification task is to assign an object to a specific class, based on a set of observed attributes of the object. Because this is a computationally hard problem, the authors propose to use tractable approximate-reasoning methods. They investigate the use and behaviour of Cadoli and Schaerf's tractable approximate-entailment method for propositional logic in the context of classification.

In the last talk of the session titled *Forecast Verification and the Uncertain Truth*, Silja Renooij presented a method for assessing the quality of forecasts based on Bayesian networks. In various domains Bayesian networks can be used as probabilistic forecasts of certain events, e.g., weather prediction. To evaluate the quality of the predictions of such networks, techniques such as the Brier score have been developed. These techniques evaluate the accuracy of the predictions by comparing them with the actual observed state. As the author points out, a weakness of methods such as the Brier score is the requirement that the predicted variables can be observed with certainty in the resulting actual state. It turns out that in many applications, there is often a degree of uncertainty on the value of the variables in the actual state. The

author presents a generalisation of the Brier score which takes this uncertainty into account. The new score requires knowledge of the actual uncertainty in the observations, but this information is often available.

The 2004 SKBS Prize

Jaap van den Herik
Director of SKBS

The Foundation for Knowledge Based Systems (SKBS) continued its policy of awarding the SKBS prize to the best demonstration of the presentations shown at the industrial exhibition of the BNAIC 2003. The assessment committee consisted of professor Jaap van den Herik (chair), professor Gerard Renardel de Lavalette, Silvie Spreeuwenberg M.Sc., and Bas Obladen M.Sc.

The referee committee had to consider eight demonstrations which were eligible for the SKBS Prize. The majority was on agents. The quality was not uniform, and the originality did not always compensate. Next to (1) quality and (2) originality, three further criteria were (3) scientific, (4) AI-relation, and (5) applicability. On the basis of these five criteria the number of candidates reduced to three demonstrations. The full list is mentioned in the BNAIC 2004 programme. Below we mention the numbers 1 to 3 of the BNAIC 2004 and subsequently we provide an overview of the winners of the SKBS prize so far.

List of best BNAIC demonstrations in 2004

1. W. Teepe
2. M. Valstar, M. Pantic, and I. Patras
3. S. Meijer and T. Vervaaert

1999 Maastricht

M. van Wezel, J. Sprenger, R. van Stee, and H. La Poutré

Neural Vision 2.0 - Exploratory Data Analysis with Neural Networks

2000 Kaatsheuvel (shared prize)

E. Zopfi

HKT

G. Schram

LubeSelect

2001 Amsterdam

Alexander Ypma, Rob Kleiman, Jan Valk, and Bob Duin

MINISOM – A System for Machine Health Monitoring with Neural Networks

2002 Leuven

F. Brazier, D. Mobach, and B. Overeinder

AgentScape Demonstration

2003 Nijmegen

Bert Kappen, Wim Wiegerinck, Ender Akay, Marcel Nijman, Jan Neijt, and André van Beek

Promedas: A diagnostic decision rapport system

2004 Groningen

Wouter Teepe

The Secret Prover: Proving Possession of Arbitrary Files While not Giving Them Away

At the closing ceremony Jaap van den Herik handed Wouter Teepe the SKBS prize of € 350.- together with his congratulations and compliments to the ANITA project in which framework the demo was developed.

It is expected that SKBS will continue its policy of stimulating the development of demonstrations in the future BNAICs.

JJ := 50

M. Birna van Riemsdijk
Utrecht University

On September 1, 2004, many mostly Dutch (AI) researchers and former researchers received mail with the informative subject: JJ := 50. The mail announced the upcoming 50th birthday of prof. dr. John-Jules Ch. Meyer, JJ for short. The senders of the mail – Wiebe van der Hoek, Frank Dignum and Richard Starmans – thought it appropriate to throw a party on this happy occasion. A party in this case being a symposium entitled Logic and Agents: it is all in the game. This piece tells the story of the event and its preparations as perceived by me, one of JJ's many Ph.D. students.

As challenging the task of organizing such an event may be anyway, the fact that it was going to be a surprise party made things even more complicated. The first hurdle that had to be taken by the organizers was ensuring that JJ was going to show up at his party (of course a party is not really a party unless JJ is there, especially if it is a party in his honor). I do not know who came up with the brilliant idea of advertising the event as a SIKS master class, but brilliant it was indeed! This master class on logic and agents of course had to have a chair and JJ was the obvious candidate. As expected, JJ was more than happy to chair this event (although as we learnt later, the fact that the program was already completely composed by the time he was asked to chair, struck him as a bit odd...).

Another difficulty that had to be overcome was explaining to JJ why the master class was going to be held in one of Utrecht University's bigger lecture

halls. I could not help overhearing a conversation between JJ and Frank on this subject, in which JJ explained to be somewhat puzzled by the fact that a master class on a topic like logic and agents, fascinating though it may be, could attract enough attention for it to be held in the scheduled lecture hall (to which Frank replied that there really was no other option as many rooms were booked already and besides, our research group alone can easily fill the smaller rooms...).

As the days went by and the date of the party in disguise neared, everybody was careful not to refer to the event as JJ-day in JJ's presence. Speaking for myself, I was quite relieved when the big day finally came and Frank explained to the well-prepared chair that the symposium that was about to take place was organized on the occasion of his 50th anniversary.

The first talk, entitled *Update and Revision in the Course of a Game*, was given by Johan van Benthem. He argued that understanding agents' behavior in the course of a game involves both information update and belief revision about future expectations. He presented a temporal framework encompassing both and identified logical issues arising. Then Wiebe van der Hoek gave a talk involving alternating time temporal logic (ATL). This is a branching-time like logic in which one can reason about what coalitions of agents can bring about, by choosing appropriate strategies. He argued how model checking ATL can be used to deal with the effectiveness, feasibility and synthesis problem of adding social laws to an agent system. Virginia Dignum, who has recently completed her Ph.D. thesis under supervision of JJ, next discussed contracts in agent societies. She argued that especially in open environments agents should have contracts to regulate their interactions, and presented a formal specification of these contracts, based on some form of deontic logic. This interesting and more serious part of the symposium was closed by talks by Catholijn Jonker, who addressed negotiation among agents, and finally Cees Witteveen, who discussed the application of ideas from model-based diagnosis and revision to single-agent and multi-agent planning systems.

Apart from setting up this intriguing symposium as a present for JJ, the organizers also took the initiative to put together a Liber Amicorum. In the mail that was sent around to announce the event, the addressees were asked to submit a short piece containing memories of working with JJ, photographs, technicalities appealing to JJ and the like. The efforts of many culminated in a booklet that was handed to JJ by Wiebe van der Hoek, accompanied by a colorful presentation. Many of

the contributions refer to JJ's cheerful nature (and the fact that he now tries to build these kinds of emotional states of mind into theories of (rational) agency). Further, the liber contains a number of interesting technical contributions, and also more or less frequently mentioned are JJ's enthusiasm, his dedication, his eye-catching appearance, discussions after six p.m., the spelling of possessives in English, his admirable professional career and Rammstein. The event ended with one of the highlights of the day: a presentation by JJ's Ph.D. students Jurriaan van Diggelen, Davide Grossi and Geert Jonker on behalf of JJ's research group.

The presentation – or should I say “performance” – was centered around the professor's hobby, which is mixing dance (or, according to the presenters, megasuperdancetribaltriphopchemicallyhyperacid) music. One of JJ's (or DJJJ's, or better yet, D3J¹'s) mixes accompanied the show, which further included grooving formulas, (not) Corry en de Rekels, and much more (and Moore).

Concluding, I very much enjoyed the party for JJ and as far as I could tell, he did too!

IOP MMI Event

*Report by Niels Netten
University of Amsterdam*

On the 11th and 12th of November 2004 the IOP MMI event took place at the NH Koningshof in Veldhoven. This event was organized by SenterNovem, an agency that is responsible for the execution of grant schemes in the field of technology, energy, environment, exports and international partnerships, on behalf of the Dutch Ministry of Economic Affairs (see for further information about SenterNovem www.senter.nl). The IOP projects (Innovatiegerichte Onderzoeks-programma's) of SenterNovem have been created to stimulate innovative research and enable a better accessibility by businesses into the research world. Furthermore, these IOP projects should enable better and more intense contacts between businesses and the research community. SenterNovem provides the means to bring research and businesses together by giving financial assistance for the realization of innovative projects and the groundworks for business-research relations.

¹ To be pronounced as D-triple-J.

One of the IOP themes in which SenterNovem is involved is MMI (Human-Machine Interaction). The main objective of the IOP MMI is to increase the strategic research in this specific field by means of a programmatic approach at the Dutch universities and research institutes so that the demand for innovation in business will be met. The two-day IOP MMI event at the NH Koningshof in Veldhoven was organized to bring interested business people from middle-large to small Dutch businesses together with researchers and thus enable collaboration on innovative MMI research projects.

On the first day of the event, the finished or almost finished research projects (12 in total) were scheduled and were presented in parallel sessions. The focus of these research projects has been on the ease of use and proactive systems for users. The reason for SenterNovem to choose this is that more and more complex applications are being developed that become more difficult to use when instead these applications should be easy to use by the users and in an even better case should be able to anticipate user activities.

The research projects presented on day one:

- **Multi-modal Access to Transaction and Information Services (MATIS), by Bert Cranen**
Using automatic transaction and information services for a big audience that are only based on speech cause problems which can possibly be fixed by combining speech information with visual information. Due to the rise of cellular phones with screens the solutions to the problem are near. In MATIS two concrete applications are developed to have insight into the way speech and visual feedback in a human-machine dialogue need to be combined to give a multi-modal dialogue an added value with respect to its uni-modal opponent.
- **Creating Robustness In Multi-modal Interaction (CRIMI), by Jacques Terken**
Voice control (interacting with computer-based applications by means of speech) has received increased attention over the last decade. However, there are serious drawbacks in the application of voice control for real-life contexts. Among other things, extraneous sound (noise, surrounding speech) seriously impedes the performance of the speech recognizer. In addition, computers assume that all speech that "reaches their ears" (arrives at the microphone) is in fact meant for them. The latter property creates

problems in multi-person situations, where interaction with a system may be interleaved with human-human communication, as it will lead to inappropriate system responses ("Sorry, I did not understand; could you please repeat?"). Recent advances in perceptive technology have offered potential solutions for these problems.

- **Co-operative Observing MMI for Personalised Assistance and Narration as Induced by Operator Needs (COMPANION), by Peter Jorna**

Computers present their information without any regard on the momentary status and needs of the user. The information is presented when it is least needed or even interrupts other task activities. In normal day-to-day communication between humans, the information sender first checks if the receiver (e.g., your boss) is able and willing to absorb that information at this particular time. The COMPANION project develops technology that allows computers to do the same, making computers better machines to work with.

- **User-friendly interfaces for effective navigation through medical imaging data sets, by Marc Neerinkx**

Ongoing rapid innovations in medical imaging techniques provide us with imaging data sets of ever-increasing complexity. For meaningful interpretation of these data sets, the use of computer workstations for image post-processing is mandatory (3D-reconstructions, virtual endoscopy). In clinical practice, there is a need for a user-friendly, intuitive user interface to handle the various display methods in a workable fashion. In this project, a demo version of such a user interface will be built that has wide applicability and good user acceptability. The demo version will serve as a starting point for the further development of a new generation of radiological workstations.

- **Interaction and Dialogue structures in User Interfaces (IDUSI), by Jacques Terken**

The IDUSI project aims at developing generic guidelines based on knowledge of natural human communication processes to support the design of multimedia user interfaces and to improve their interactive characteristics. The design guidelines will be applied and evaluated in existing and new applications (i.e., remote maintenance and

manuscript specification) and generalized to other application domains.

- **Modelling business goals and business processes in GTA, by Johan Hoorn**

Many design processes fail, or lead to unacceptable frustration, because business goals and business processes are not considered in task analysis, and because the analysis and specification of requirements are not systematically related to the content and structure of task models. In industrial practice, both the analysis and redesign of business goals (and related approaches like CommonKads) as well as task analysis (e.g., GTA) are regular practice.

- **3D Interaction with Scientific Data, by Jean-Bernard Martens**

This project addresses the interaction with scientific data, more specifically volumetric data. Contrary to 2D data, that contain a value for each position in a planar region, volumetric data have a value for each position in a region of three-dimensional space.

- **Interactive disclosure of Multimedia Information and Knowledge, by Laura Hollink**

The exploration of multimedia datasets on content is essentially different than for numerical data because multimedia data only can get meaning in the context of the user. Goal of this project is to develop and implement a general framework for disclosure of multimedia datasets in which the interactive search of the user is being supported integral by content analysis of text, image- and video, domain specific knowledge descriptions, and visualizations of the data space.

- **Trust and Control in Message Acquisition from information servers (TACOMA), by Don Bouwhuis**

Despite good progress in decision theory, there has been little effort towards trying to apply its results in technology. Likewise, research in the field of information presentation and believability is scarce. Nevertheless, it appears that in the continuous advance of information and transaction systems the trust of the user in the system is a critical variable for acceptance. This issue is investigated in two research projects. In the first project, the degree of control of the user over the information system is manipulated while the knowledge,

background information, direct and indirect experience will be systematically varied. In the second project both the form of the information and the source of the information (e.g., person, or information system) will be varied. On the basis of the research results, guidelines for the design of information systems and their interaction styles will be drawn up.

- **Personal assistant for on-line services (PALS), by Mark Neerinx**

A personal assistant able to adjust the interaction to the continuously changing user needs and usage contexts. TNO Human Factors, and the universities of Twente and Utrecht, are developing new interaction paradigms for accessing mobile services. Built on solid theoretical and empirical base, the project has provided methods to assess and support user navigation behaviour as well as user interface functions for effective and efficient attention focusing, and demos showing resulting interaction process for traffic & transport and financial & commerce scenarios.

- **Mental models of incidental human-machine interaction, by Cristina Chisalita**

Increasingly, people are applying information technology and complex interactive systems both in work situations and for leisure activities. TV sets and home computers are merging into a single device. Telephones, watches and personal assistants are growing towards each other. Public services are growing: electronic counters, ATM combined with electronic shopping, information booths, etc. Most users of these systems are not "professional" users, and the frequency of use will be low, resulting in low motivation for reading directions or for training (which would not be feasible anyhow in most cases). Systems and devices have to be designed to fit the users and the task situation optimally. The user needs to understand the functionality of the device and the relation of this to his own task in order to be able to apply the system. Incidental use requires the development of a valid mental model on the spot. The system needs to invoke this at first sight in order to support the users' task problems optimally. In order to develop a generic design approach for this type of system use several research questions were answered:

1. What are relevant aspects of mental models for incidental human-machine interaction with complex systems?
2. What are the characteristics of this type of mental model that can promote effective design?
3. What is a valid and relevant conceptual framework for investigating mental models with a view to designing the intended type of system?
4. Can valid techniques be developed for assessing mental models that allow simple and reliable measurement?
5. How can these techniques be applied early in the design process to provide relevant design guidelines and ideas, and how can the techniques be used for usability analysis during design?

▪ **Designing technologies for children, by Mathilda Bekker**

The aim of the project is to gather information about how to evaluate interactive products for children. We focus on (educational) computer games for children in the age group 5 to 7 and in our definition of usability we will consider aspects of fun and pleasure in addition to the commonly used criteria like efficiency and effectiveness. Globally, there are two categories of usability evaluation methods: empirical and analytical methods. While empirical evaluation methods are based on the actual observation of usability and fun problems, it is often uncertain what caused the observed problem. Analytical methods start from reasoning about causes for problems and predict that problems will occur when users interact with the product.

On the second day, the new research project presentations were scheduled as well as the presentation of a keynote speaker from the United Kingdom. The second day started with a presentation by Bill Gaver, Professor of Interaction Research at the Royal College of Art of London. In his presentation Gaver discussed a number of recent projects that explore design for conceptual appropriation, and emphasise the roles of ambiguity, openness, and subjective interpretation in future technologies for our everyday lives. Gaver is currently involved in interdisciplinary research collaboration between several universities in the United Kingdom, called EQUATOR. Equator's central goal is to investigate the integration of the

physical and digital worlds by developing innovative systems. An example of the projects that Gaver is involved in is the electronic furniture for the curious home, which includes the history tablecloth, the drift table and the key table with picture frame. The tablecloth draws attention to the flow of objects over a surface in the home by signalling how long things have been left upon it. If an object is left on the table for a while, a glowing halo forms beneath it that grows slowly over time, until the object is moved. This object raises issues about the desirability of using technology to emphasise existing behaviour. The Drift Table enables people to slowly float over the British countryside from their own sitting room. The pressure of objects left on this table control the slow scroll of aerial photographs displayed in the table surface. Adding weight to the table causes it to 'descend' zooming in on the landscape below, stacking books on the same side of the table may allow for faster motion. This table suggests a 'hole' in the home connecting physical and virtual space. A display on the side of the table shows the location of the aerial image. The key table gets a sense of people's emotions from the way they dump their stuff onto it. Much as slamming doors is a crude measure of mental state, so the table uses the transient onsets of a new weight to gauge mood. The table would trigger reactions to emotional entrances in a variety of ways. For example, mechanised frames might swing pictures off centre to warn other inhabitants to tread carefully. For more information about the research of Bill Gaver use the following URL: <http://www.interaction.rca.ac.uk/research/people/bill/1.html#>

During the rest of the day, the scheduled parallel sessions were held (6 in total) in which project leaders presented their innovative research projects and explained the research to be conducted. In these sessions, participants were able to ask questions about the research project and possibly start a discussion on the subject. People that went to a specific presentation, who after hearing the presentation became interested in the research, had the possibility to get involved as a participant of the support commission ("begeleidingscommissie") of that specific research project. As a member of the support commission one can give advice or indicate possible directions for the research during several phases of the project. The focus of the new projects were slightly different from the former projects since SenterNovem decided that the emphasis for the future projects should be more on the design and evaluation of systems that make complicated applications more simple and attractive thanks to the knowledge of the user and its context.

The research projects presented on day two:

- **Ambient Awareness, by Panos Markopoulos**

The project aims to develop knowledge regarding a novel type of technology that we call Ambient Awareness. In the proposed project, we are specifically interested in applications of Awareness Systems to support social communication for leisure rather than work.

- **SuperAssist: personal assistants for distributed supervision of complex task environments, by Mark Neerinx**

The overall project goal is to develop guidelines, models and methods for joint user-assistant supervision of complex task environments, which is effective and efficient, which is trustworthy for the user, and for which the interaction takes place in a socially approved manner. The models capture the mutual relationships between personalisation, users' system knowledge, roles, trust, autonomy and social acceptability.

- **A Propos: Pro-active personalization for professional document writing, by Lou Boves**

A Propos aims to develop operational methods that can generate a search profile on the basis of a collection of documents previously written by a group or one of its members. The profile must enable effective, high-precision information mining relevant for specific workgroups, it must be able to adapt to the information needs of individual members of the workgroup and to the development over time of the work of the group and its members.

- **Task-adaptive information distribution, by Maarten van Someren**

The project addresses the problem of selecting and distributing information for collaborating users as a function of their tasks and the state of their workflows. Two main factors determine how information should be distributed: relevance for the task that the user is performing and the (information) load in his current and future tasks. Irrelevant information should be suppressed and if overload threatens the distribution, and possibly the workflow, should be adjusted. The processing load must be distributed over the people performing the task such that no one becomes overloaded.

- **Determinants of social presence, by Don Bouhuis**

The project focuses on 2-person telecommunication (videoconferencing) with a very high degree of social presence. The goals are essentially threefold. The first is to devise a system that provides direct eye-contact and realistic visuo-spatial and auditory rendering of the participants. The system should also be adaptive in order to maintain eye contact during physical movement of the participants. This involves the identification of a number of technical and psychological parameters mediating the feeling of presence.

- **Virtual Assistant, by P.A. Wieringa**

In the field we see a growing problem with operator support in learning processes. A good example is driver training. Driver training takes place on the road under supervision of an instructor. The major problems are the unconditioned environment and the lack of automation of instruction. This results in a relative long training with low quality of training. Concrete problems with this traditional way of training are: high prices for students, low profit for driving schools, low quality of education and no standardization.

These presentations were not all that was going on during the IOP MMI event. In between all the sessions, during both days, there was the possibility to visit the knowledge-market, where businesses and research groups involved in MMI (Human-Machine Interaction) were able to present their work within the field with posters and demo's. Furthermore these breaks between sessions enabled people to make new contacts with interested business people or other researchers or discuss the research projects.

This IOP MMI event has been interesting for many participants, as it has been for me, since it laid the groundworks for new relations with other people involved in the same research area. It enables people from industry to participate in the research projects and the "support committees". The collaboration on the innovative research projects by businesses and researchers will contribute to research results that probably better associate to what people need in practice. Also, the shift in focus towards industrial interest results in a larger role for technology and thereby for Artificial Intelligence. This has been a very fertile event for many of the participants hopefully leading to very good research project results.

A Continued Increase of Theses

Jaap van den Herik
IKAT, Maastricht

The year 2004 outperformed the results of the booming year 2003 by no fewer than 8 Ph.D. theses. In the December 2003 issue of the *BNVKI Newsletter* (corrections to that article are in the February 2004 issue) we were delighted on the booming series of Ph.D. theses in that year, namely of 37. The improvement then was significant and now it is even more significant. For an adequate overview I would like to refer you to the numbers presented in the table below.

After eleven years of publication of Ph.D. defence announcements we reached a grand total of over 300 announcements on AI-related theses. We admit that (1) the announcement section is open to all AI theses and AI-related theses, such as theses from the research school SIKS (including, among others, theses on information systems and on (multimedia) databases), and that (2) there are also theses from related domains, such as AI and Medicine, AI and Law, and AI and Civil Engineering. Yet 45 is quite a number.

Last year I expressed as my expectations that “within five years (1) the number of Ph.D. defences per year will be above 50 (i.e., from 37 in 2003 to 51 in 2008) and consequently (2) the average number over 5 years will be above 30.” The second expectation is a direct consequence of the first expectation.

In the February 2004 issue I refined this statement to the following prediction: 2004 (39), 2005 (42), 2006 (45), 2007 (48), and 2008 (51). It is easy to see that we surpassed the expectation of 2004 and that we achieved the aims of 2006. For the year 2005 the goal should be reset to 46. The new goals then are 2006 (47), 2007 (49), and 2008 (51). It must be manageable. Achieving these goals will lead to an average of 33.1 in 2008.

Although we do not distinguish the Ph.D. defences by domain, two general remarks are in order: (1) the current results mean that the average is again raised from 25.9 per year (over ten years) to 27.6 (over eleven years); (2) our close cooperation with the research school SIKS shows the following increase. In 2001 we had 11 SIKS Ph.D. theses (out of 25), in 2002 it was 17 out of 33. In 2003 18 out of 37. This year (2004) it reads 20 out of 45.

Year	# of Theses
1994	22
1995	23
1996	21
1997	30
1998	21
1999	28
2000	19
2001	25
2002	33
2003	37
2004	45
Grand Total	304

As a courtesy to the Ph.D. students who completed their thesis in 2004 we list them below together with their promotion date.

V. Dignum (12-1), M.A.R. Leisink (16-1), T. Gerrits (19-1), L.T. Smit (23-1), L.J. Hommes (26-1), H.P. Röhrig (27-1), A. Hegyi (3-2), L. Xu (20-2), P. Groot (23-3), C.A. van Dorp (30-3), N. Pelov (1-4), V. Popova (1-4), C. van Aart (6-4), W.P.A.J. Michiels (8-4), D. Kostic (28-4), E.G. Boltjes (13-5), O.M. van Herwijnen (17-5), K. Driessens (27-5), L.C. Cruz-Felipe (15-6), M. Caminada (22-6), The Duy Bui (1-7), W. Jamroga (1-7), E.H. Gerding (6-7), B.P. Harrenstein (6-9), P. Kleve (10-9), K. Verbeeck (23-9), M. Klein (14-9), F. Alkemade (7-10), J. Verbeek (14-10), N. Jacobs (15-10), S. Kabel (20-10), F. Divina (26-10), P. de Bruin (8-11), A. Knobbe (22-11), T. Westerveld (25-11), V.B. Machado (29-11), M. Winands (1-12), S. Brand (3-12), J.J. Verbeek (8-12), Z. Zhao (9-12), M. Evers (10-12), C. Versteegt (15-12), Y. Saanen (21-12), E. van de Kar (22-12), J. Struyf (23-12).

EXPECTATIONS

What are our expectations for 2005? Obviously, we believe that the number of Ph.D. defences will be somewhere in the forties. In Delft, Professor Henk Sol (Information Systems) has set his personal record to over 50 Ph.D. defences. Still, not a general record, since this record is in the hands of Professor Herman van Bakkum (chemistry) with a number of Ph.D. students in the order of 76 (to be verified by this author). Henk Sol (now at the University of Groningen) has still 27 students running. In SIKS we are doing our utmost to give our Director John Jules Meyer a pleasant farewell party by achieving the total number of 100 Ph.D. defences before he leaves. We are now at 93 (January 2005 inclusive). Back to our expectations. Next year our average over twelve years will be 29. It brings me to the next topic. The comparison with our neighbouring countries. The VSNU has produced a publication titled *Hora Est?*, in which many figures are given

and many comparisons are made. The result of the Netherlands are quite reasonable, but it is good to see that the attention for successful Ph.D. defences is increasing worldwide. I would like to encourage my colleagues to pay attention to their Ph.D. students and to raise their number and not to forget the quality, i.e., the scientific level.

SIKS

As stated above the cooperation between the BNVKI and SIKS has been arrived now at a mutual level of feeling well. Let us be careful, since the challenge is to keep it there. Still, we expect that in 2005 the relation will grow. To encourage the SIKS promovendi (since September 1, 2003 all AiOs are called promovendi) we list the 20 SIKS promovendi below together with their promotores, and the promotion dates.

SIKS PROMOVENDI 2004

- 2004-01
Virginia Dignum (UU). *A Model for Organizational Interaction: Based on Agents, Founded in Logic*. Promotor: Prof.dr. J.-J.Ch. Meyer (UU). Co-promotores: Dr. F. Dignum (UU), Dr. H. Weigand (UvT). Promotion: 12 January 2004.
- 2004-02
Lai Xu (UvT). *Monitoring Multi-party Contracts for E-business*. Promotor: Prof.dr.ir. M.P. Papazoglou (UvT). Co-promotor: Dr.rer.nat. M.A. Jeusfeld (UvT). Promotion: 20 February 2004.
- 2004-03
Perry Groot (VU). *A Theoretical and Empirical Analysis of Approximation in Symbolic Problem Solving*. Promotor: Prof.dr. F.A.H. van Harmelen (VU). Co-promotor: Dr. A.C.M. ten Teije (VU). Promotion: 23 March 2004.
- 2004-04
Chris van Aart (UVA). *Organizational Principles for Multi-Agent Architectures*. Promotores: Prof.dr. B.J. Wielinga (UvA), Prof.dr. A.Th. Schreiber (VU). Promotion: 6 April 2004.
- 2004-05
Viara Popova (EUR). *Knowledge Discovery and Monotonicity*. Promotor: Prof.dr. A. de Bruin (EUR). Co-promotor: Dr. J.C. Bioch (EUR). Promotion: 1 April 2004
- 2004-06
Bart-Jan Hommes (TUD). *The Evaluation of Business Process Modeling Techniques*. Promotor: Prof.dr.ir. J.L.G. Dietz (TUD). Promotion: 26 January 2004.
- 2004-07
Elise Boltjes (UM). *Voorbeeldig onderwijs; Voorbeeldgestuurd Onderwijs, een Opstap naar Abstract Denken, Vooraf voor Meisjes*. Promotores: Prof.dr. M.J.H. Meijer (UM), Prof.dr. H.J. van den Herik (UM). Promotion: 13 May 2004.
- 2004-08
Joop Verbeek (UM). *Politie en de Nieuwe Internationale Informatiemarkt, Grens-regionale Politie Gegevens-uitwisseling en Digitale Expertise*. Promotores: Prof.dr. H.J. van den Herik (UM), Prof.mr. Th.A. de Roos (UL). Promotion: 14 October 2004.
- 2004-09
Martin Caminada (VU). *For the Sake of the Argument; Explorations into Argument-based Reasoning*. Promotor: Prof.dr. R.P. van de Riet (VU). Co-promotor: Dr.mr. H. Prakken (UU). Promotion: 22 June 2004.
- 2004-10
Suzanne Kabel (UVA). *Knowledge-rich Indexing of Learning-objects*. Promotores: Prof.dr. R. de Hoog (UVA) Prof.dr. B.J. Wielinga (UVA). Promotion: 20 October 2004.
- 2004-11
Michel Klein (VU). *Change Management for Distributed Ontologies*. Promotores: Prof.dr. A.Th. Schreiber (VU), Prof.dr. J.M. Akkermans (VU). Promotion: 14 September 2004.
- 2004-12
The Duy Bui (UT). *Creating Emotions and Facial Expressions for Embodied Agents*. Promotor: Prof.dr.ir. A. Nijholt (UT). Co-promotor: Dr. D.K.J. Heylen (UT). Promotion: 1 July 2004.
- 2004-13
Wojciech Jamroga (UT). *Using Multiple Models of Reality: On Agents who Know how to Play*. Promotores: Prof.dr.ir. A. Nijholt (UT), Prof.dr. W. van der Hoek (University of Liverpool). Co-promotor: Dr. J. Zwiers (UT). Promotion: 1 July 2004.
- 2004-14
Paul Harrenstein (UU). *Logic in Conflict. Logical Explorations in Strategic Equilibrium*. Promotores: Prof.dr. J.-J. Ch. Meyer (UU), Prof.dr. W. van der Hoek (University of Liverpool). Co-promotor: Dr. C. Witteveen (TUD). Promotion: 6 September 2004.
- 2004-15
Arno Knobbe (UU). *Multi-Relational Data Mining*. Promotor: Prof.dr. A.P.J.M. Siebes (UU). Promotion: 22 November 2004.

2004-16

Federico Divina (VU). *Hybrid Genetic Relational Search for Inductive Learning*. Promotor: Prof.dr. A.E. Eiben (VU). Co-promotor: Dr. E. Marchiori (VU). Promotion: 26 October 2004.

2004-17

Mark Winands (UM). *Informed Search in Complex Games*. Promotor: Prof.dr. H.J. van den Herik (UM). Co-promotor: Dr. J.W.H.M. Uiterwijk (UM). Promotion: 1 December 2004.

2004-18

Vania Bessa Machado (UvA). *Supporting the Construction of Qualitative Knowledge Models*. Promotor: Prof.dr. B.J. Wielinga (UvA). Co-promotor: Dr. B. Bredeweg (UvA). Promotion: 29 November 2004.

2004-19

Thijs Westerveld (UT). *Using Generative Probabilistic Models for Multimedia retrieval*. Promotor: Prof.dr. F.M.G. de Jong (UT). Co-promotor: Dr. A.P. de Vries (CWI). Promotion: 25 November 2004.

2004-20

Madelon Evers (Nyenrode). *Learning from Design: facilitating multidisciplinary design teams*. Promotors: Prof.dr. W. Baets (Nyenrode), Prof.dr. G. van der Veer (VU). Co-promotor: Dr. Th. Homan (Nyenrode). Promotion: 10 December 2004.

The current list of new Ph.D. defences, officially ranging from December 2004 up to the future in 2005, is given below. It is augmented by four theses from before December 1, 2004 since they were not announced before.

P. de Bruin (November 8, 2004). *Accurate and High-Quality Surface Mesh Extraction from Medical Image Data*. TU Delft. Promotor: Prof.dr. ir. F.W. Jansen.

H.J. Honig (November 15, 2004). *Towards On-line Logistics: the LinC Interaction Modeling Language*. TU Delft. Promotors: Prof.dr. H.G. Sol and Prof.dr.ir. G. Lodewijks.

T.H.-W. Westerveld (November 25, 2004). *Using Generative Probabilistic Models for Multimedia Retrieval*. Universiteit Twente. Promotor: Prof.dr. F.M.G. de Jong. Assistant-promotor: Dr. A.P. de Vries.

V.B. Machado (November 29, 2004). *Supporting the Construction of Qualitative Knowledge Models*. Universiteit van Amsterdam. Promotor: Prof.dr. B.J. Wielinga. Co-promotor: Dr. B. Bredeweg.

S. Brand (December 3, 2004). *Rule-based Constraint Propagation: Theory and Applications*. Universiteit van Amsterdam. Promotor: Prof.dr. K.R. Apt.

J.J. Verbeek (December 8, 2004). *Mixture Models for Clustering and Dimension Reduction*. Universiteit van Amsterdam. Promotor: Prof.dr.ir. F.C.A. Groen. Co-promotors: Dr.ir. B.J.A. Kröse and Dr. N. Vlassis.

C. Versteegt (December 15, 2004). *Holonic Control for Large Scale Automated Logistic Systems*. TU Delft. Promotor: Prof.dr. H.G. Sol.

Y.A. Saanen (December 21, 2004). *An Approach for Designing Robotized Marine Container Terminals*. TU Delft. Promotors: Prof.ir. J.C. Rijnsbrij and Prof.dr. H.G. Sol.

E.A.M. van de Kar (December 22, 2004). *Designing Mobile Information Services*. TU Delft. Promotor: Prof.dr. H.G. Sol.

E.M. Pekalska (January 17, 2005). *Dissimilarity Representations in Pattern Recognition*. TU Delft. Promotor: Prof.ir. I.T. Young. Adjunct promotor: Dr.ir. R.P.W. Duin.

L.J. Hommes (January 26, 2004). *The Evaluation of Business Process Modeling Techniques*. TU Delft. Promotor: Prof.dr.ir. J.L.G. Dietz.

F. Grootjen (January 26, 2005). *A Pragmatic Approach to the Conceptualisation of Language*. Radboud University Nijmegen. Promotors: Prof. dr.ir. Th. P. van der Weide and Prof.dr. C.H.A. Koster.

E.C.D. van der Werf (January 27, 2005). *AI Techniques for the Game of Go*. Universiteit Maastricht. Promotor: Prof.dr. H.J. van den Herik. Co-promotor: Dr. J.W.H.M. Uiterwijk.

F. Verdenius (January 28, 2005). *Methodological Aspects of Designing Induction-based Applications*. Universiteit van Amsterdam. Promotor: Prof.dr. B.J. Wielinga. Co-promotor: Dr. M.W. van Someren.



ADVANCED COURSE: COMPUTATIONAL INTELLIGENCE

Introduction

On February 17 and 18, 2005 the School for Information and Knowledge Systems (SIKS) will organize an Advanced Course on Computational Intelligence. The course takes two days, will be given in English and is part of the so-called Advanced Components Stage of the Educational Program for SIKS Ph.D. students. Although these courses are primarily intended for SIKS Ph.D. students, other participants are not excluded. However, their number of passes will be restricted and depends on the number of students taking the course. The course is given by experienced lecturers actively involved in the research areas related to the topics of the course.

Location

Conference center Woudschoten in Zeist

Scientific Directors

- Prof.dr. A.P.J.M. Siebes (UU)
- Dr. U. Kaymak (EUR)
- Dr. J.C. Bioch (EUR)

Preliminary Program

The program is not known yet, but may include advanced topics from:

- machine learning
- intelligent data-analysis/data-mining
- neural and evolutionary computing
- adaptive / self-organizing / fuzzy systems
- probabilistic reasoning / Bayesian networks
- pattern and image recognition
- Intelligent search algorithms / games

Registration

In the conference center there is a limited number of places and there is interest from other groups in the topic as well. Therefore, an early registration is required.

Deadline for registration for SIKS Ph.D. students:

February 1, 2005. After that date, applications to participate will be honoured in a first-come first-serve manner. Of course, applications to participate from other interested groups are welcome already. They will receive a notification whether they can participate as soon as possible. For registration you are kindly requested to fill in the registration form at the SIKS-site.

ADVANCED COURSE: XML; WHERE DATABASES AND INFORMATION RETRIEVAL MEET

Introduction

On April 18 and 19, 2005 the School for Information and Knowledge Systems (SIKS) will organize an advanced course on XML-databases and information retrieval. The course takes two days, will be given in English and is part of the so-called Advanced Components Stage of the Educational Program for SIKS Ph.D. Students. Although these courses are primarily intended for SIKS Ph.D. students, other participants are not excluded. However, their number of passes will be restricted and depends on the number of students taking the course. The course is given by experienced lecturers actively involved in the research areas related to the topics of the course.

Location

Conference center Woudschoten in Zeist.

Scientific Directors

- Dr. D. Hiemstra (UT)
- Dr. ir. M. van Keulen (UT)

Program

The program is not available yet. The course focusses on the use of database and information retrieval techniques for managing large amounts of XML data. XML is **the** web standard for exchanging data on the world wide web. The standard comes with a number of tools that are available in database systems as well, like schema's (DTDs and XML schema) and query languages (XPath, Xquery), but some things are still missing like efficient storage, query processing and indexing of XML data. As XML is often used to markup textual data, XML data management systems need to support techniques from search engines as well, for instance full-text search and ranking of search results.

Some of the subjects addressed are: Mapping of XML data to relational systems; How do commercial database systems manage XML? The theory and expressive power of XML query languages; XML/semistructured information retrieval; Evaluation of XML retrieval systems.

More details will be made available at www.siks.nl soon.

**BASIC COURSES: “COMBINATORY METHODS”
AND “LEARNING AND REASONING”**

Introduction

From May 9-13, 2005, the School for Information and Knowledge Systems (SIKS) organizes two basic courses “Combinatory Methods” and “Learning and Reasoning”. Both courses will be given in English and are part of the obligatory Basic Course Program for SIKS Ph.D. students. Although these courses are primarily intended for SIKS Ph.D. students, other participants are not excluded. However, their number of passes will be restricted and depends on the number of SIKS-Ph.D. -students taking the course.

Location

Landgoed Huize Bergen in Vught.

Scientific Directors:

- dr. N. Roos (UM): Combinatory Methods
- dr. A. Ten Teije (VU): Learning and Reasoning

Program

The program is not available yet. More details will be made available at www.siks.nl soon.

**CONFERENCES, SYMPOSIA,
WORKSHOPS**

Below, the reader finds a list of conferences and websites or addresses for further information.

MARCH 10-11, 2005

Future Business Technology Conference 2005 (Fubutec-2005). Insead, Fontainebleau, France.
<http://biomath.ugent.be/~eurosis/conf/fubutec/fubutec2005/index.html>

MARCH 24-26, 2005

Social Intelligence Design 2005 (SID 2005). Stanford University, Stanford, Ca, USA.
<http://pbl.stanford.edu/News/SID2005.html>

MARCH 27-31, 2005

The 3rd International Conference on Sciences of Electronic, Technologies of Information and Telecommunications (SETIT 2005). Susa, Tunisia.
<http://www.universites.tn/setit>

MARCH 29-APRIL 1, 2005

The 2005 IEEE International Conference on e-Technology, e-Commerce and e-Service (EEE-05). Hong Kong.
<http://www.comp.hkbu.edu.hk/~eee05>

APRIL 2-10, 2005

8th Intl. Conf. on Fundamental Approaches to Software Engineering (FASE 2005). Edinburgh, Scotland.
<http://fase05.disi.unige.it/>

APRIL 4-6, 2005

IEEE Symposium on Computational Intelligence and Games. Essex University, Colchester, UK.
<http://www.cigames.org>

APRIL 11-13, 2005

10th Annual Euromedia Conference (Euromedia 2005). Toulouse, France.
<http://biomath.ugent.be/~eurosis/conf/euromedia/euromedia2005/>

MAY 4-6, 2005

ACM International Conference on Computing Frontiers (CF '05). Ischia, Italy.
<http://cf05.ac.upc.es>

MAY 10-14, 2005

The Fourteenth International World Wide Web Conference (WWW2005). Chiba, Japan.
<http://www2005.org/>

MAY 22-25, 2005

International Conference on Computational Science (ICCS 2005). Atlanta, USA.
<http://www.iccs-meeting.org/>

MAY 24-28, 2005

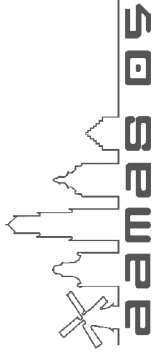
International Conference on Enterprise Information Systems (ICEIS-2005). Miami, USA.
<http://www.iceis.org>

JUNE 6-10, 2005

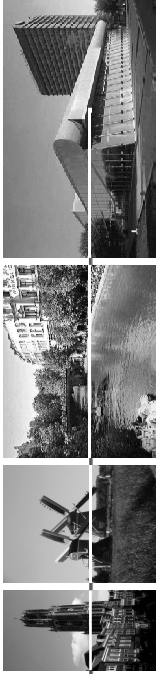
Tenth International Conference on Artificial Intelligence and Law (ICAAIL 2005). Bologna, Italy.
<http://www.iaail.org>

JUNE 13-17, 2005

The 17th Conference on Advanced Information Systems Engineering (CAiSE'05). Porto, Portugal.
<http://www.fe.up.pt/caise2005/>



Autonomous Agents & Multi Agent Systems



Utrecht University, The Netherlands

July 25 to 29, 2005

<http://www.aamas2005.nl>

events

scientific

- >> AAMAS conference
- >> Workshops
- >> Demo Sessions
- >> Poster Sessions

industry

- >> Industry Track
- >> Exhibits

learning

- >> Tutorials
- >> Doctoral Mentoring Program

co-located events

- >> The 7th European Agent Systems Summer School (EASSS-05)
- >> Agent Solutions Event

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general co-chairs:

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Munindar Singh, North Carolina State Univ.

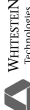
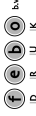
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COPY

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