NEWSLETTER

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ToKeN2000 Workshop

Small Adaptive Systems in Finance

Optimal Learning and the Spacing Effect

News from the Belgium-Netherlands Association for Artificial Intelligence

AI in the Picture

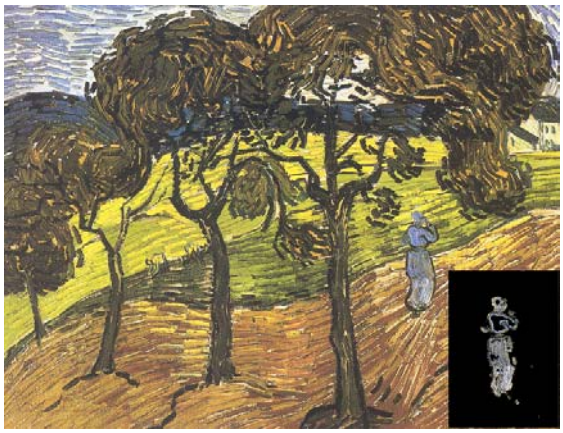
Editor-in-chief

I am honoured to be invited to become the new editor-in-chief of the BNVKI Newsletter. Of course, my appointment has to be decided about at the upcoming general BNVKI assembly at the BNAIC'04, October 21-22, in Groningen (see the call for participation on pp. 70-71 of this issue). Meanwhile, I will act as ad interim editor-in-chief. Before introducing myself, let me first thank our previous editor-in-chief, dr. Floris Wiesman, for editing the newsletter during more than three years. Being a close colleague of Floris, I regret that he left our department, but I wish him all the best in his new job at the Academic Medical Centre (AMC), Amsterdam.

So let me introduce myself briefly. Since 1988 I work, first as an assistant professor, then associate professor, at the Department of Computer Science, some years later integrated into the Institute of Knowledge and Agent Technology (IKAT), at the Universiteit Maastricht. My research concentrates on computer games, and, more specifically, on the use of intelligent search techniques. Computer game playing had a respectable history in AI, and it still has, witness the contents of this issue. revealing several topics dealing with computer games and game theory. Let me hasten to say that the contents of this issue were mainly decided upon before my entrance of the stage. But more than enough said of me. Let me put the spot-light on two other AI researchers.

With a full article of more than 2200 words, AI hit one of the world's most prestigious newspapers, the New York Times. On June 13, 2004, a front-page article by Douglass Heingartner appeared, under the title A Computer That Has an Eye for Van Gogh. In this article report is made on the Authentic project, part of a ToKeN2000 project, in which paintings are analyzed with the aid of AI techniques to verify their authenticity. Projectleaders Professor Eric Postma and Ph.D. student Igor Bereznoy M.Sc., both of IKAT, explain how AI meets Art in this stunning domain. In the foreseeable future such applications will obviously become increasingly important. Therefore I predict that AI will be in the picture more and more in the years to come. Your newsletter will report on this!

Jos Uiterwijk



Appeal for a new BNVKI Board member

The Board of the BNVKI invites members of the BNVKI to make themselves available for becoming board member of the BNVKI. The Board encourages mainly people from trade and industry to respond. In case of several applicants of equal capability, preference will be for female applicants. If interested, please contact the chair of the Board, Prof.dr.ir. J.A. La Poutré (see the back cover of this issue for contact information).

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BNVKI-Board News

Han La Poutré

Just a few weeks after the submission deadline of the upcoming BNAIC, the reviewing process is in full swing. The numbers of submissions are promising: 46 A-papers, 52 B-papers, and 7 C-papers. Thus, more than last year. Interestingly, there is a significant shift from A-papers towards B-papers: last year had 53 A-papers and 35 B-papers.

This year's BNAIC has two novelties. Firstly, one of the special tracks is related to the SNN: the Foundation of Neural Networks. And secondly, this year the BNAIC proceedings will have an ISSN series number, like usual for journals, magazines, and series of technical reports. The Board will evaluate the effects of this after the BNAIC.

Last but certainly not least; Floris Wiesman has stepped down as Editor-in-Chief of the BNVKI Newsletter and member of the Board. This is because he moves to another job, leaving Maastricht. The Board regrets this very much, since Floris has been a valuable member of the Board as well as a very capable Editor-in-Chief of the Newsletter. We would like to thank him a lot for all his actitivies and substantial contributions and wish him all the best in his new job.

ToKeN2000 Workshop

Christiane Klöditz
NWO

After two fruitful ToKeN2000 workshops in June 2000 and February 2002 and a first ToKeN2000 symposium in February 2003 a third ToKeN2000 workshop was held on March 26, 2004 at the Nieuwe Academie building in Groningen. The workshop was organised by the Netherlands Organisation for Scientific Research (NWO) and the Institute for Artificial Intelligence of the University of Groningen.

The audience in full attention.

ToKeN2000 - ACCESS TO KNOWLEDGE AND ITS ENHANCEMENT NETHERLANDS 2000 - is an interdisciplinary research programme, in which cognition and computer science focus on fundamental problems affecting interaction between human beings on the one hand, and knowledge and information systems and the products they yield on the other hand. Fundamental research issues are Control, Navigation, Language technology, Delivery techniques, and Knowledge enhancement.

The ToKeN2000 research is concentrated around three fields of application, namely Education & Culture, Law enforcement & the judicial system and Health care. At present twelve ToKeN2000 projects are ongoing (five projects in the health care sector, six projects in the field of education and culture and one project on law enforcement and the judicial system). Of these twelve projects six were presented during the workshop due to lectures by PhD students and Postdoctorals who are directly involved. The keynote presentation was on Intelligent Mobile Companions by Prof. Anthony Jameson of the German Research Center for Artificial Intelligence (DFKI) and the International University in Germany. The plenary sessions were interrupted by a poster session after the lunch break.

REPORT OF THE DAY'S PROCEEDINGS

Meanwhile a ToKeN2000 tradition, the chair of the programme committee, Prof. Jaap van den Herik (Universiteit Maastricht) opened the workshop and welcomed the speakers and the participants. In his lecture he gave a short summary of the achievements over the last years. The most important announcement, however, was that of the launching of a request for proposals for ToKeN2000. Before June 2, 2004 proposals can be submitted within one of the three ToKeN2000 fields of application, namely Law enforcement & the judicial system. According to Van den Herik this is an important step for this research programme, which was made possible by NWO in close cooperation with the Council for the Judiciary (Raad voor de Rechtspraak).

Jaap van den Herik opens the workshop.

KEYNOTE LECTURE

In his keynote lecture "Intelligent Mobile Companions: New Assistance or Nuisance?" Prof. Anthony Jameson stated that in certain situations intelligent companions are extremely useful, for example in video route descriptions. Unfortunately, at present the dialogue with the existing companions is still quite slow. In his talk, Jameson examined several typical issues concerning the usability of intelligent companions. He presented some impressive examples of companions developed by the DFKI. Furthermore, he raised the question whether people really find systems with such capabilities useful and usable in everyday life? Are people not reluctant to use these companions because of a general feeling of mistrust? One of his main conclusions was the existence of a gap between theoretical visions on the companions on the one hand and the problems that arise when people try to use these systems on the other. If tried in a realistic setting people are still unwilling to use the companions in certain situations and environments. To try to overcome this gap Jameson emphasized the need to take all requirements, wishes and constraints into account when developing these systems.

Prof. Jameson trying to bridge a gap.

PROGRESS ON TOKEN2000
MORNING SESSION

The following lectures addressed the progress made in the ongoing ToKeN2000 projects. Young ToKen2000 researchers enthusiastically presented their work.

The first talk by Drs. Egon van den Broek (University of Nijmegen) and Ir. Niek Bergboer (Universiteit Maastricht) was on a user-centred approach for Content-Based Image Retrieval (CBIR). Both researchers are working in the project EIDETIC which deals with the automatic recognition of image content from digital images. The possibilities of content-based search techniques are studied. Of specific interest are the analysis and retrieval of digital art collections.

The morning session was concluded by dr. Elena Zudilova of the University of Amsterdam who is working in the ToKeN2000 project DIME on a system for vascular reconstruction - the Virtual Radiology Explorer (VRE). DIME is a collaboration between researchers at the Leiden University Medical Center and the Universities of Amsterdam and Twente. In her lecture Zudilova discussed the functionality and features of the VRE system as well as possible ways for its improvement.

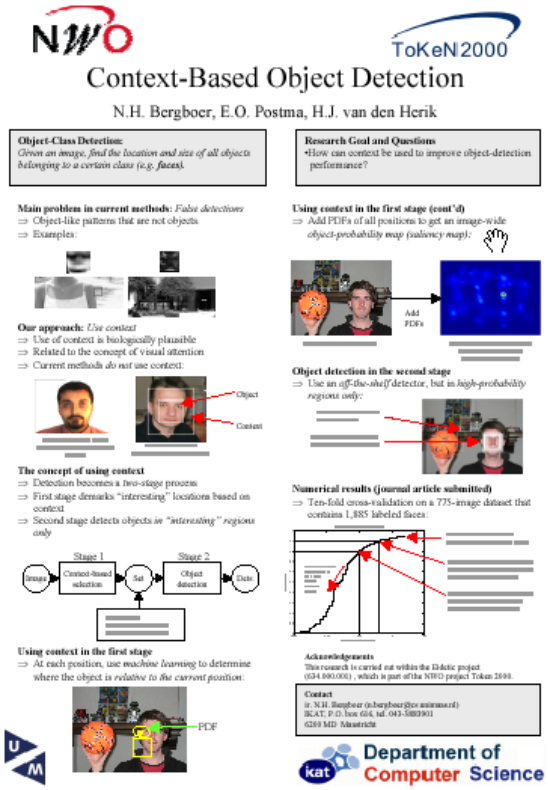
Lunch was served in the Grand Café of the Nieuwe Academie while young musicians of the Groningen conservatorium entertained the workshop participants with a repertoire of classical music on piano and violin.

POSTER SESSION

After the lunch an impressive poster session was held where ToKeN2000 researchers presented the developments within their projects. The 22 submitted posters illustrated the progress made since the previous ToKeN2000 day in 2003.

Information retrieval on the run.

At the end of the day the winner of the poster contest - nominated by the participants - was announced. The poster entitled Context-Based Object Detection (Authors: N.H. Bergboer, E.O. Postma, H.J. van den Herik - Universiteit Maastricht, IKAT) won the contest.



And the winner is …

PROGRESS ON TOKEN2000 AFTERNOON SESSION

Ir. Theodore Charitos (University of Utrecht) started the afternoon session with a lecture on medical decision support, specifically a Bayesian model of bacterial colonisation of the respiratory tract. The Bayesian network is part of a decision-theoretic model, which describes the effects of antibiotics in patients in the intensive care unit (ICU). The model is part of a decision-support system, currently under development in the TIMEBAYES project.

Following was Drs. Wouter Teepe of the University of Groningen who spoke about the trade-off between confidentiality and availability, which is currently under research in the ToKeN2000 project ANITA. This project concentrates on the legal problems with respect to the rights and duties concerning the collection and processing of data for certain enquiries.

In his talk on the ongoing CHIME project Dr. Frank Nack (CWI) focussed on the goals of the CHIME environment, which facilitates the various processes within semi-automated presentation generation. The CHIME project is investigating the use of semantic models for tailoring the presentation of cultural information extracted from existing repositories to different types of users. Nack outlined the achievements of the first year and described future plans.

Dr. Floris Wiesman (Universiteit Maastricht) held the final lecture of the day on agent-based support for physicians. Wiesman carries out research in the MIA-project that investigates how structured (e.g., lab data) and unstructured (e.g., narratives such as progress reports) medical data can be combined in a way that different physicians in a hospital are provided with relevant information.

Workshop Chair Prof. Lambert Schomaker concluded the day with a few words of thanks to the speakers, particularly the keynote speaker, the approximately 70 participants and those involved in the organisation of this interesting and inspiring day.

2nd EUNITE Workshop Smart Adaptive Systems in Finance

Yuri Hamburger
Erim, Erasmus University Rotterdam

The second EUNITE Workshop on Smart Adaptive Systems in Finance has taken place at the Faculty Club of the Erasmus University Rotterdam, The Netherlands, on May 19th 2004. The workshop aimed to provide a platform for the professionals in the financial sector to exchange ideas, opinions and experience about the opportunities for smart adaptive systems, including data mining, neural networks, machine learning, fuzzy modelling, soft computing and evolutionary computation within the finance sector. The presentations showed a cross-section from the state-of the art in this field, recent academic developments and successful applications of the smart adaptive technologies in the finance sector. The speakers at the workshop were practitioners and experts from large financial institutes, academia and SME's. They gave examples of smart adaptive technologies applied in the field of mutual funds, credit risk, asset allocation, operational risk and more.

The workshop started with an opening statement from Jan van den Berg. He explained the goals of the workshop, introduced the European Network of Excellence on Intelligent Technologies for Smart Adaptive Systems (EUNITE) and acknowledged the support from the Dutch Research School of Information and Knowledge Systems (SIKS).

RISK ANALYSIS

The first speaker in the workshop was Winfried Hallerbach, from the Erasmus University Rotterdam. As an introduction to the various presentations, he provided a concise overview of financial risk analysis and management. He discussed the various categories of risk, from market risk, credit risk and operational risk to reputational risk, systemic risk and model risk. He made clear that there are only stupid mistakes but that the impact can be large and hazardous. Risk is always unexpected and deals with deviations from expectations. Important is to give "... approximate answers to precise problems and not precise answers to approximate problems ... ".

Winfried Hallerbach was followed by Joop Huij from the Rotterdam School of Business, Erasmus University Rotterdam. He gave a presentation about „Cross-Sectional Learning and Risk and Return Analysis". Traditional risk and return measures typically suffer from small sample bias and are potentially highly inaccurate. Particularly when only short horizons of monthly returns are used, these estimates can be highly inaccurate. Huij suggests to use shrinkage estimation: a combination of inference from data and a-priori information. To do this, Joop Huij suggests an extension of a Bayesian framework in a way that prior beliefs become adaptive to market dynamics. Furthermore, different methodologies for estimating the hyperparameters are discussed and how the accuracy and ranking ability is studied by means of a Monte Carlo simulation. The results indicate that the extended model shows improved accuracy and ranking abilities.

FUND RETURNS

Pieter Jelle van der Sluis, from ABP Investments continued the workshop by presenting "Market Timing: A decomposition of Mutual Fund Returns". Van der Sluis explained that mutual fund returns can be decomposed into five parts. Two parts, selectivity and expert market timing can be attributed to the skills of the (mutual fund) manager and three to the variation in market exposure that can be achieved by private investors as well. Decomposing the mutual fund returns in such a way helps explaining why fund returns are different. Since an institution as ABP Investments invests partly internally and partly externally, it's interesting to see to what extent (mutual fund) manager skills attribute to the fund return.

The next speaker in the line was Heru Sataputera Na from the Rotterdam School of Economics, Erasmus University Rotterdam. He presented "Improving Asset Allocation using a CART Model". This work is the result of a case offered by ROBECO, which had the goal to compare three investment strategies to increase the performance of a Fund Manager. This improvement can be gained by temporarily deviating from the standard investment strategy given by a client, resulting in hypothetically improved returns. The analysis is performed by using a Classification And Regression Tree (CART). The goals of this research were to gain insight in the importance of relevant indicator variables and to improve performance by intelligently adapting the investment strategy.

AND RISKS ANALYSIS AGAIN

The fifth speaker in the workshop was Peter van der Putten from KiQ ltd. He presented "BASEL II Compliant Credit Risk Management: the OMEGA Case". In this presentation, high-level requirements for adaptive modeling in a BASEL II credit risk context are highlighted. First of all, the speaker explained the basics of Basel II. The goal of the new Basel Accord (Basel II) is to make capital requirements for banks more sensitive to risk. Banks are allowed to calculate risk components based on models developed by the bank itself on its own data, when the Internal Ratings Based (IRB) approach is followed. A tool for smart adaptive risk management is OMEGA. OMEGA was initially designed for predictive model development for credit risk management, using genetic algorithms. In the end, OMEGA developed into a full decision management suite for optimizing the entire customer relationship, including risk. As core modeling algorithms, logistic regression, additive scorecards, decision tree and genetic algorithms are available.

Lourenço Miranda from ABN-AMRO followed Peter van der Putten by presenting "Subjective Information and the Quantification of Operational Risks". The focus of the presentation was to give insight about the applicability of smart adaptive systems in the domain of operational risk. Operational risk is the risk of loss resulting from inadequate or failed internal processes, human behavior, systems or from external events and is neither market risk nor credit risk. In order to deal with operational risk, a combination of quantitative information and qualitative information, such that the combination forms economic capital for operational risk. Quantitative information focusess on past experience, where qualitative information focusess on future expectations. Qualitative information can be treated by using credibility theory, Bayesian systems or by using smart adaptive systems such as fuzzy logic. Using fuzzy

logic enables to process qualitative knowledge, to quantify qualitative information, use causal modeling by assigning linguistic labels to risk factors and use the causal model to develop a distribution of losses based on management expectations for the levels of risk factors.

MODELLING AND DIAGNOSIS

The seventh speaker in the workshop was George Dikos from MIT. He presented "A System Identification and Learning Approach to Tanker Freight Modelling". The presentation was based on a project, which had the focus to develop structural equilibrium models for real and auxiliary markets. The ultimate goal was structural estimation: using economic theory to determine the functional form. G. Dikos explains how to aggregate shipping investment decisions, by means of a three party model: 1) Actions of Entry, 2) Lay-up charter decisions of the existing fleet and 3) Actions of exit.

The last speaker in the workshop was Emiel Caron, from the Rotterdam School of Business, Erasmus University Rotterdam. He presented "Extending the OLAP framework for automated diagnosis of business performance". The focus of the presentation was to show how OLAP could be extended with explanation formalism, such that symptoms in a business environment can be explained. The purpose of On-Line Analytical Processing (OLAP) systems is to provide a framework for the risk analysis of multidimensional data. Business diagnosis is an important task in multidimensional analysis. Business diagnosis is defined as finding the "best" explanation for observed symptoms. However, current OLAP systems provide only little support for business diagnosis. By extending the OLAP system with explanation formalism, this functionality can be provided. In order to extend OLAP with explanation formalism, Caron shows that the extension is based on an existing explanation model, which tries to make relations between objects, their properties and reference classes. The goal is to explain why a certain object has a property, when the members of a reference class do not. The explanation model is adapted in such a way that it can deal with multidimensional data and can generate explanations for it.

The workshop was concluded by U. Kaymak from the Erasmus University Rotterdam, who remarked that the given presentations showed that models can be made more inline with reality by using better predictions, improved explanation and stronger decision support. Furthermore, the potential for smart adaptive systems has been demonstrated in the presentations of the speakers.

Modular Variable-length Representations from Pareto-Coevolution

Guido de Croon
IKAT, Universiteit Maastricht

On May the 24th, Dr. Edwin de Jong from Utrecht University was invited for a SIKS/IKAT-colloquium in Maastricht. Dr. de Jong explained his current research on the development of representations. In particular, he discussed an algorithm, DevRep [1], which enhances genetic algorithms by developing the representation of the search problem during search. The following is a short summary of his presentation.

Genetic algorithms typically employ a fixed representation, i.e. a fixed mapping between the genotype and the phenotype. Since the operators of variation are usually fixed too, the genetic algorithm cannot change the possible movements in the search space and the search space itself. Such algorithms are less suited for large search problems that require the maintenance and combination of different large partial solutions. One reason for this is that certain variation operations, such as crossover, do not respect the boundaries in the genome between partial solutions.

Edwin de Jong explaining …

Large search problems with structure can be tackled, however, if the representation of the problem is adapted during the search. Sets of variables that represent a partial solution can be grouped into modules, so that the variation operators cannot influence them. An individual is then a combination of multiple modules and serves as a context for the evaluation of these modules. The utility of a module depends on the extent to which modules are valuable in multiple contexts. An important novel feature of DevRep is that modules are evaluated by deriving objectives from

Pareto-coevolution. In addition, the algorithm can be applied to problems where the genome has a variable length.

The presentation concluded with an illustration of DevRep's performance on a few example problems, including the 1024-bit Hierarchical-XOR problem. The algorithm outperforms fixed length and variable length genetic algorithms, because of the exploitation of the functional modularities of the problems.

[1] Edwin D. de Jong, technical report UU-CS-2003-009, institute of information and computing sciences, Utrecht University.

Karl Tuyls's Ph.D. Thesis

Learning in Multi-Agent Systems, An Evolutionary Game Theoretic Approach

Joris van Looveren
AI-Lab, CoMo,VU Brussel

Multi-agent systems (MAS) are more and more often becoming the modelling tool of choice for many complex systems, such as traffic management or network load balancing. Entities in such a system are described using agents, which can navigate around a network and communicate to each other.

The naive way to program such a system would be to enumerate all possible states, and define the best behaviour for each agent in each state. But, as the environment becomes more complex and/or the number of agents increases, this strategy rapidly becomes infeasible. Consequently, learning in MASs is important, but also very complicated. Reasons for this are plentiful: the environment can change, either by itself or due to the actions of other agents, the other agents in the system may change their behaviour, etc.

An interesting learning technique for MASs would be reinforcement learning (RL). However, the theoretical underpinnings for reinforcement learning are only valid for single-agent systems, and they do not carry over easily to multi-agent systems. Several attempts at shaping MASs to conform to the RL theory assumptions have been tried, but they either result in systems that are too restrictive to do interesting things with, or they betray the assumptions that make MASs interesting: asynchrony, distributedness, etc.

The initial formal link between Evolutionary Game Theory and RL was made by Bšrgers et al (1997) in the context of Cross Learning, a special instance of RL, where they showed that the learning model converges to the asymetric continuous time replicator equations of EGT. These replicator equations describe the evolution through time of the different agent strategies.

In his thesis, Tuyls carries these initial results further, extending the theory to popular and widely used models of RL: Learning Automata and Q-learning. He develops both the theoretical extensions of the existing theories, and validates it using for instance Dispersion Games, a type of games where agents must distribute a set of tasks among themselves so that no two agents solve the same problem. He shows how the Replicator Dynamics theory of Evolutionary Game Theory maps on Reinforcement learning, how this mapping can be used to find out where the attractors of the system lie and how this can guide how the system's parameters are tuned. A corollary of the work is that it turns out to be profitable to first define the dynamic behaviour of a new algorithm; this seems to yield better results than classical algorithms.

More info:
http://como.vub.ac.be/Members/karl.htm

Agents Are In

Jaap van den Herik
IKAT, Universiteit Maastricht

The current state of the art is Agent Technology. Therefore, it is not a surprise that the notion 'agent' appears in the title of many Ph.D. theses. "Agents are in" as can be seen from the list below. Three theses of our list show the notion on their title page. However, is it not high time to revisit our previous discussion on the textual titles and in particular on their lengths? It is not my intention to replace such texts, by images or by other multimedia experiments that are nowadays possible. No, I would like to emphasise that the old adage "the shorter, the better" still holds. Only Michel Klein (Vrije Universiteit) has a title of five words. Our compliments.

Back to the agents. We see: 'embodied agents', 'agents who know how to play', and 'agents in bargaining games'. So, the relations between agents and games are clear, but what type of game are we dealing with? The world of games has drastically changed over the last ten years, from chess to football, and from abstract games to commercial ones. Even 'life' can be seen as a game.

The progress in scientific relations is developing in all kind of directions. The world is changing and the Ph.D. research subjects will evolve with them. The prevailing question now is: what comes after agent technology?

At this moment the Editors would like to congratulate five Ph.D. students with their work. We hope that it will be a milestone in their career and wish them a bright future.

We look forward to have the books announced below reviewed in the BNVKI Newsletter. Finally, we are grateful to Joris van Looveren for his review of Karl Tuyl's Ph.D. thesis.

PH.D. DEFENCES

The Duy Bui (July 1, 2004). *Creating emotions and facial expressions for embodied agents*. TU Twente. Promotor: Prof.dr.ir. A. Nijholt. Co-promotor: Dr. D.K.J. Heylen.

W. Jamroga (July 1, 2004). *Using Multiple Models of Reality: On Agents who Know how to Play*. TU Twente. Promotores: Prof.dr.ir. A. Nijholt, Prof.dr. W. van der Hoek. Co-promotor: Dr. J. Zwiers.

E.H. Gerding (July 6, 2004). *Autonomous Agents in Bargaining Games: An Evolutionary Investigation of Fundamentals, Strategies, and Business Applications*. TU Eindhoven. Promotores: Prof.dr.ir. J.A. La Poutré, Prof.dr. H.M. Amman.

B.P. Harrenstein (September 6, 2004). *Logic in Conflict. Logical Explorations in Strategic Equilibrium*. Universiteit Utrecht. Promotores: Prof.dr. J.-J.Ch. Meyer, Prof.dr. W. van der Hoek. Co-promotor: Dr. C. Witteveen.

M. Klein (September 14, 2004). *Change Management for Distributed Ontologies*. VU Amsterdam. Promotores: Prof.dr. A.Th. Schreiber, Prof.dr. J.M. Akkermans.

Section Editor
Richard Starmans

Agents Everywhere
UT/SIKS Symposium

July 2, 2004
University of Twente, Enschede

PROGRAM

9:15	Opening by Dr. Dirk Heylen, UT, chairman.
09:30-10:00	Prof.dr. W. van der Hoek, University of Liverpool.
10:00-10:30	*Expressive gesture for ECAs*, Prof.dr. C. Pelachaud, Univ. de Paris, France.
10:30-11:00	E. Herder, Ph.D. student, UT.
11:00-11:15	Coffie break
11:15-11:45	Dr. Zsofia Ruttkay, CWI.
11:45-12:15	Dr. Maja Pantic, TUD.
12.15-13:15	Lunch break
13:15-13:45	*Mobile agents*, Dr. M.A. Bednarczyk, Institute of Computer Science, Polish Academy of Sciences, Poland.
13:45-14:15	*Modeling social interaction and influence*, Dr. S. Marsella, USC Information Sciences Institute, the USA -
14:15-14:45	*Decidability and Completeness of the Alternating Time Temporal Logic*, Prof.dr. V. Goranko, Rand Afrikaans University, South Africa.
14:45-15:15	D. Reidsma, UT.
15:15	Conclusion by W. Jamroga, Ph.D. student, UT.

SID 2004
Workshop on Social Intelligence Design

July 5-7, 2004
University of Twente, Enschede

SID 2004 is the third workshop on the subject of social intelligence design focused on the significance of information technology in our lives, work, home, and on the move. In this workshop we consider Social Intelligence (SI) as the ability for people to relate to, understand and interact effectively with others. Our particular concern is how SI is mediated through the use of new technologies.

MAIN THEMES OF SID 2004

Natural Interactions: theory, modelling and analytical frameworks that have been developed

with Social Intelligence Design in mind, including situated computation, embodied conversational agents, sociable artifacts, socially intelligent robots.

Communities: community media, communication patterns in online communities, knowledge-creating, network and anonymous communities.

Collaboration Technologies and Tools: innovations to support interactions within communities; a range from knowledge sharing systems, multi-agent systems and interactive systems.

Application Domains: design, workspaces, education, e-commerce, entertainment, digital democracy, digital cities, policy and business.

INTENDED PARTICIPANTS

This workshop is intended for all who are concerned with the impact of advanced information and communication technologies on social intelligence, in particular, researchers, developers and designers of new ways of communicating enabled and supported by such technologies. The contributions will be published in the workshop proceedings.

PROGRAMME CHAIRS

Anton Nijholt (TU Twente)
Program Co-Chairs:
Toyoaki Nishida (Tokyo University, Japan)
Renata Fruchter (Stanford University, USA)
Duska Rosenberg (University of London, United Kingdom)

INVITED SPEAKERS

Stefan Agamanolis (Media Lab Europe, Dublin, Ireland)
Kerstin Dautenhahn (University of Hertfordshire, United Kingdom)
Will Harvey (There Inc, Menlo Park, USA)
Stacey Marsella (CARTE, Marina del Rey, USA)
Others to be confirmed

ORGANIZERS

The workshop will be organized under the auspices of the Centre of Telematics and Information Technology (CTIT) of the TU Twente and Human Media Interaction group of the CTIT.

For any questions related to workshop and submission contact sid04@cs.utwente.nl. The program chair can be reached at anijholt@cs.utwente.nl.

AI Education

Section Editor
Evert van de Vrie

M.Sc. Theses in Section AI Education

Supervisors of remarkable M.Sc. work are invited to ask their student for a short article, to be submitted to the editor of the Section AI Education.

Optimal Learning Wins Thesis Contest

Evert van de Vrie

Viktor de Boer won the KION thesis contest 2002/2003 with his master's thesis 'Optimal learning and the spacing effect'. The jury reported a high quality of the nominated theses, but with definitely one outstanding winner. The research of Viktor was both theoretical and experimental and aimed at explaining the 'spacing effect': the often noticed occurrence of better human study results when learning activities are repeated, separated by time intervals of optimal length. Elsewhere in this newsletter the abstract of the thesis is published.

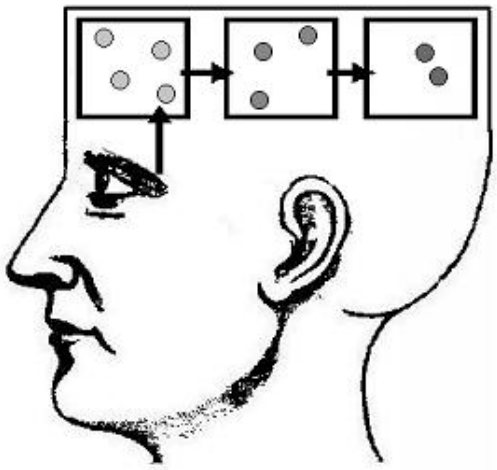
THIRD CONTEST

The KION thesis contest started with the issue 2000/2001, so this issue was the third one. The aim of the thesis contest is to pay attention to the field of research and education of AI in the Netherlands. For students it is interesting to participate, not only for the honours, but also for the reward: this year 600 euro.

All six AI schools in the Netherlands nominated their best thesis of the year 2002/2003. All six schools also participated in the jury: Eduard Hoenkamp (KUN), Rineke Verbrugge (RUG), Jos Uiterwijk (UM), Menno Lievers and Janneke van Lith (UU), Bert Bredeweg (UvA) and Martijn Schut (VU). The whole process was coordinated by Albert Visser (UU). A thorough procedure, with explicit criteria (originality, quality, scientific relevance, structure and presentation) was followed. Other nominated theses were on cooperative behaviour of robots, cognitive modelling, information retrieval, evolutionary behaviour and evolution of communication.

WINNER STUDIED AT UVA

Viktor de Boer (born in 1979) studied Artificial Intelligence (Computational Psychology) at the University of Amsterdam. His thesis research fitted within the still ongoing work of Jaap Murre and Tony Chessa on the Memory Chain Model. For his research Viktor had to enter a, for him relatively unknown, field of science, but the combination of literature research, modelling, experimenting and formal proving turned out to be very stimulating. The experience of encountering unexpected results and trying to explain them, showed Viktor the unpredictable process of doing research. Today Viktor is doing his Phd at the UvA (SWI), with research on the semantic web.



Optimal Learning and the Spacing Effect

Viktor de Boer
UvA

The research question of the thesis can be formulated as 'How can the available learning time best be distributed?'. This question is relevant to many fields, the foremost and most obvious being the field of education. Can a solid theory of memory, learning and forgetting be constructed? One that we can use to predict the effects of certain learning strategies and more useful, enable us to directly calculate optimal learning strategies.

The positive effects on retention of distributed learning were first noted by the famous memory researcher Hermann Ebbinghaus. He found that when items where presented with very short intervals ('Massed'), the retention was much worse than when the intervals were longer ('Spaced'). This phenomenon was later dubbed the Spacing Effect.

After Ebbinghaus, several other researchers found the effect in many different circumstances, proving it to be a robust phenomenon. They also found that this effect does not go on infinitely and that therefore an optimal distribution of presentations exists. Researchers have, however not succeeded in providing a solid theory on the reasons this effect occurs and there exists no qualitative model explaining it.

The model we used to approach the distribution of presentations is the Memory Chain Model, a quantitative, mathematical model of memory conceived by Jaap Murre and Tony Chessa. One of the basic assumptions of this model is that memory representations are located in one or more memory stores. A memory is represented by one or more points. When a memory is formed, points are formed in the first store. As time progresses, decay occurs and points can be copied to other memory stores, in a feedforward manner. This process is driven by a Point Process, making the model a probabilistic one.

For the Memory Chain Model to deal with distributed presentations, we need to explore what happens when a single item is presented multiple times. We assume that the memory encoding capacity of the first store is limited by a saturation parameter. This saturation limits the effect of all subsequent presentations. The first presentation has a maximum effect, while the next presentations will sooner hit the limit of the first store. Our calculations showed that because of this saturation effect, a Memory Chain Model with two or more memory stores predicts a Spacing Effect and that the optimal distribution of presentations can be calculated.

To test the model on the spacing effect, we designed a framework for an online Computer Assisted Language Learning tool: OptiLearn, based on Jaap Murre's 'Captain Mnemo'. We chose to present the users with Turkish-Dutch word pairs as the items the users should learn. With the tool, we can collect enough data on human memory that can be used to estimate the learning, forgetting and saturation parameters of the model.

We developed a number of estimators for the model parameters, including a rough analytical estimator and a more precise numerical method. For both methods, we assumed the recall threshold parameter, an important model parameter, to be equal to the default value 1, which denotes the minimum number of retrieved memory features

('points') for recall to take place. We also defined methods to calculate an optimal distribution of presentations once the model parameters had been estimated.

We designed an experiment for the tool, modelled after an experiment by Glenberg. We tested the recall among subjects of Turkish-Dutch word pairs for different time intervals since learning. From this experiment and a similar experiment, conducted at the same time, we learned that the recall threshold took a value that was higher than the default value, namely, 3. This resulted in our estimation methods not being applicable in these specific circumstances. A second was therefore conducted.

Among the results of this second experiment we found that the spacing effect indeed occurred, but the Memory Chain Model could not yet describe our multi-presentation data. This resulted in a number of recommendations for future research.

For further information: www.neuromod.org and memory.uva.nl. The thesis can be found online at www.neuromod.org/mnemo/victor/Scriptie.pdf

USCKI Incognito Symposium Viva La Evolución

Marijn Schaagen, Eline Spauwen en Janne Willems (students of Utrecht University)

On Wednesday the 12th of May, a symposium titled Viva la Evolución took place in Utrecht, the main topic being Evolutionary Psychology and Artificial Life. This symposium was organised by the study association for Cognitive Artificial Intelligence at the University of Utrecht. Four lecturers talked about topics varying from the origin of modern intelligence to the modelling of behaviour of schools of fish. Next to the lectures, the annual KION award for the best Dutch AI thesis of 2003 was presented and a demonstration of the Utrecht Virtual Life Lab was given on this symposium.

The brunt was borne by the chairman of the day, dr. Hans van de Braak of the Erasmus University. He gave a short introduction on the topic in which he described the development of evolutionary psychology. The first important step was, of course, the work of Charles Darwin, which laid the foundation for the theory of evolution. The discovery of DNA in the 20th century was another large step. This special field raises an important question: is evolution a determined process, or might things as well have 'evolved' very differently? Artificial Life has good prospects of delivering an answer to this question in its future.

NEURAL PLASTICITY

The first lecturer was John R. Skoyles, philosopher of science and neuroscientist of the London School of Economics. His topic was neural plasticity, the ability of specialized brain areas to perform other tasks than the tasks they seem specialized in. Research on animals has shown that with the visual cortex ruled out, the visual signals can be processed by the auditory cortex. In the animal's brain a connection was found between the eyes and the medial geniculate nucleus, which normally provides the communication between the ears and the auditory cortex. It also turns out that in blind persons, the visual cortex is used during all kinds of sensory activities. This contradicts the idea that certain brain areas are selected by evolution for certain functions. From this, the following conclusion can be drawn: evolution selects genes that can optimize, instead of genes that can specialize. These genes create a neural network that specializes only after birth. This idea is supported by research: after birth, no new neurons are formed in the brain, but many new connections between the neurons are constructed. These connections determine the function. This specialisation could be prevented from happening, though, by the so-called phenomena of God Hacking: the property of genes to favour themselves above others during replication, without this having an advantage for the organism. This form of evolution eventually didn't win. Why it didn't, is unknown. The best way to investigate this is by letting the selection process in artificial life be a part of the organism. Unfortunately, it is not yet possible to realize this. John Skoyles lecture was fluent and of a pretty high level. This sometimes left little space for the audience to think about what was being said. But, in the end, the clarity of the lecturer's style compensated for this fact.

KION AWARD

After the first lecture, the third KION award was presented. This year's winner is Viktor de Boer, for his thesis 'Optimal Learning and the Spacing Effect: theory, application and experiments based on the Memory Chain Model'. The award was received by Tony Chessa, the supervisor of De Boer. He gave a short elucidation of the subject. It is known that information is retained better if it is presented multiple times, with pauses in between (the Spacing Effect). The research of De Boer was aimed at deciding what the optimal distribution of information and pauses is. He used the Memory Chain Model for this, a mathematical model of

memory that assumes different sections inside the memory with a decreasing detail and a decreasing speed of loss of a memory at every section. It turns out that this model fits well on the data coming from his experiments. Unfortunately, not all effects were explained, so there is certainly room for further research.

VIRUTAL LIFE LAB

During lunch break, the Virtual Life Lab gave their demonstration. This lab, consisting of a group of students under the guidance of AI-scientists Walter de Back and Robbie Veldkamp conducts experiments by means of the computer program Framsticks. This program uses entities with complexly evolving genotypes that interact with each other and the virtual environment. The development of species was illustrated in this presentation.

The Virtual Life Lab demonstration.
F.l.t.r: John Skoyles, Liane Gabora, Joost Wegman (member symposium committee), Saskia v/d Nieuwenhof (Chairman Symposium committee).

GROUP BEHAVIOUR

The next lecturer was dr. Charlotte Hemelrijk, theoretical biologist at the Rijksuniversiteit Groningen. Her lecture was about computer simulations of fighting behaviour of monkeys and movement of schools of fish. Once again, it was concluded that complex behaviour can arise from simple rules, even in high-order animal species like monkeys. This is diametrically opposed to the conception that animals operate an extensive social model of group hierarchy. For the primates, dr. Hemelrijk uses a model with a number of rules about movement and fighting behaviour of agents. It turns out that from this model communities can originate that are diverse and that can be observed in nature. The kind of community that arises is dependent on a single variable, namely the intensity of aggression. Phenomena like forming of coalitions, distribution of individuals over space and choice of partners, that in the field of biology are usually explained adaptively, are side effects of this model. Of course, this doesn't simply prove that living organisms operate the same rules, but it is an elegant explanation of the behaviour. For fish, the same principle holds. The simple rule 'group, turn with the rest and prevent yourself from getting to close', explains the form, the local density and the distribution of size over the school, the evading of predators and the collecting of food. Adaptive behaviour again has no role in this explanation. The model also leaves room for specification of species. This process is based on choice of partner, and in the model the fish are sorted by size. This can be a clue for specification. In the future, artificial life researchers hope to be able to explain an increasing amount of (evolutionary) behaviour in models like these.

EVOLUTION OF HUMAN COGNITION

Liane Gabora was the third lecturer, a researcher at the Berkeley University of California. This lecture was about two transitions and the evolution of human cognition. The first transition was that of Homo Habilus to Homo Erectus, about one and a half million years ago. This transition marked the beginning of the cognitive functions of planning and a larger ability to adjust. This change has been related to a change in the brain. Homo Habilus' mind was episodic; events and stimulus-response associations were stored in it, but without 'free access' to those memories, without a world picture, language or oriented learning. Homo Erectus did have a world picture, and used symbols, oriented learning and refined instruments.

According to Liane Gabora, this world picture came into being on account of a process called conceptual closure. This means, that the separate thoughts of Homo Habilus obtain associations in Homo Erectus with other thoughts that are similar to each other. Clusters of these thoughts form a concept. Clusters of concepts combined create a world picture, in which you can go from one concept to another by means of reasoning. This creates the possibility for the planning and adjustment behaviour. This change was accompanied by an enlargement of the brain. The memory uses a one-to-many relation: a new piece of input activates memories that are similar to the piece of input. The minimal size of the activate brain area needed to let the memory be meaningful is unknown. The world picture replicates itself in a different way than biological organisms: bit-by-bit,

it is taken over in a social environment, and adjustments can also be passed on.

Homo Erectus starts to look like the modern human being, but it doesn't possess any form of creativity yet. Fifty thousand years ago the second transition took place, namely the emergence of art and, possibly, language. This change is explained by Gabora by means of an introduction of oriented (analytical) and non-oriented (associative) attention. In order for creativity to emerge, both forms have to be available. An idea is introduced in the associative mode, and processed in the analytical mode. To prevent general confusion in the association process, the brains select the associations that are relevant in the context. This relevance is dependent on and constructed by the problem, desire or situation that initiated the creative process.

This lecture, which was packed with information, was concluded with a number of useful suggestions for a thesis on this subject.

A MODEL OF MORPHOGENESIS

After this, the last lecture of the day was given by the Utrecht professor Paulien Hogeweg. She criticised the current view that evolution selects on favourable properties. In a cellular automaton model that looked like a spiral wave, it appeared that cells that die off early could indeed drive cells that live longer out of the model. In living organisms, it is of course also possible that properties evolve that are bad for the organism, but that reproduce easier than good properties. This harmonizes with the remark about God Hacking made by John Skoyles, earlier this day. Next, prof. Hogeweg showed a model of morphogenesis. This is a process in which single-celled organisms, in a given stage of their life, merge together to form a large, multi-celled organism. Her model, based an a few simple rules yet again, shows for the most part the same behaviour as real-life morphogenesis processes. Supported by animations and illustrations, the members of the audience could convince themselves of the power of this model.

The symposium was closed with a public discussion that treated theses that the lectures had suggested. Different opinions about evolution, the human mind and the use of computer models surfaced during this discussion. The lecturers and the audience continued the discussion afterwards, while they were having a drink. The many positive reactions underlined the success of the day.

SECTION KNOWLEDGE SYSTEMS IN LAW AND COMPUTER SCIENCE

Section Editor
Marie-Francine Moens

Two JURIX Lectures

Reports by Evert de Pender
Legal Intelligence, Papendrecht

WWW (WHAT – WHO – WHY)

Erik van Mulligen
MC, Erasmus University, Rotterdam

Erik van Mulligen is the Chief Technology Officer at Collexis, a Dutch software company that produces an advanced information retrieval tool. Erik is also an assistant professor at the Erasmus University Medical Centre in Rotterdam. The Erasmus MC makes use of the Collexis product to access information from medical journals and is at the forefront of the recent developments of the product. Most of the examples given during the presentation were taken from the world of medical science.

Erik started with some facts and figures to illustrate the explosive growth of information (a new article about medical science is published every minute) and the resulting need for effective information retrieval tools. He then explained some of the basic principles of information retrieval with emphasis on the analysis and parsing of language and the problems caused by homonyms and abbreviations. This led on to the objectives that were defined for the Collexis product and the way in which the functionality of the product meets those objectives.

Collexis is based on the principle of fingerprinting. A fingerprint is a small item of data that records the extent to which each concept in a thesaurus for the specific field of interest is found within a document. The fingerprints are stored together with the location of the document and other meta-data. Search criteria are also represented as fingerprints so that a search can be performed by a process of fingerprint matching. It is also possible to aggregate fingerprints from documents from the same author or organization. Such fingerprints effectively provide a capability profile of the author

or organization. Although concept-based searching forms the basis of the Collexis product, the latest version supports a combination of concept-based and free-text searching which has been found to produce the best search results.

Erik ended his presentation with some examples of the use of the Collexis product within the medical sciences. Of particular interest was an example in which a multi-dimensional model of the relationships between concepts in a set of documents about malaria has revealed the proximity of previously unrelated concepts and led directly to new areas of research into combating this disease.

LEGAL INTELLIGENCE

Evert de Pender
Legal Intelligence, Papendrecht

Evert de Pender is director of Legal Intelligence, a company that has recently introduced a managed service for legal professionals in the Netherlands. An important part of this service is a search facility that makes use of the Collexis product.

Evert started by listing some of the many types of documents that are used by legal professionals and quoted an article from a leading Dutch newspaper to illustrate the discontent with the traditional ways that are used to make these documents available. The article concluded that there was a need for an independent portal that provides a single point of access to all these documents and this is the role that Legal Intelligence intends to fulfil.

A number of other business objectives were then mentioned. The quality of the search results and ease-of-use for the customer are critical to the success of Legal Intelligence and have led to the decision to provide concept-based searching. This has been implemented using the Collexis product and uses a legal thesaurus that has been developed by Legal Intelligence. The need to ensure that documents sources are up-to-date is also critical and has resulted in the establishing of close working relationships with the content providers.

A phased introduction of Legal Intelligence is foreseen and the initial version of the service that is now operational allows searching in the primary information sources (legislation, case law and official publications) from the Dutch government and EU. In addition, customers are also able to extend the scope of these searches to include their own internal information sources.

Note from the editor: The latter presentation raised some interesting discussions. It was pointed to that the proposed technologies work well when the subject domains of the texts are limited thus decreasing the risk of high maintenance costs of the thesauri and the risk of ambiguous interpretations. When the document bases and their subjects grow, advanced artificial intelligence technologies based on machine learning become a necessity for tasks such as automated thesaurus construction, conceptual classification and meaning disambiguation.

ANNOUNCEMENTS

9th Computer Olympiad 2004 and the 12th World Computer-Chess Championship

The ICGA is delighted to announce that this year's Computer Olympiad takes place from July 4 to 8, and that the 12th World Computer-Chess Championship (WCCC) will be played from July 4 to 12. Both events will be played at Bar-Ilan University, Ramat-Gan, Israel. In close cooperation with Prof. Nathan Netanyahu and Omid Tabibi, the Board of ICGA has agreed to bring both events to the city of Ramat-Gan, a lovely place in Israel, near Tel Aviv.

The 9th Computer Olympiad is a multi-games event in which all of the participants are computer programs. The purpose is to find the strongest programs at each of the games, partly as an academic exercise and partly because the competitions are fun. The organising committee consists of: H.H.L.M. Donkers, J.W. Hellemons (chair), H.J. van den Herik, N. Netanyahu, O.D. Tabibi, J.W.H.M. Uiterwijk, E.C.D. van der Werf and M.H.M. Winands. Tournaments are scheduled for the following games: Amazons, Backgammon, Chinese Chess, Go 9x9, Go 19x19, Hex, Lines of Action, Octi 6x7, Octi 9x9. The 12th WCCC is the official world championship for computer-chess programs, under auspices of the ICGA. It attracts both professional and amateur chess programmers.

PRELIMINARY SCHEDULE

Saturday July 3

The whole day	Arrival
21:30	Opening Ceremony

Sunday July 4
09:00 Testing
12:00 Players meeting
15:00-20:00 Round 1 WCCC
10:00-20:00 Computer Olympiad

Monday July 5
08:30-13:00 CG 2004 Conference
15:00-20:00 Round 2 WCCC
13:30-20:00 Computer Olympiad

Tuesday July 6
08:30-12:45 CG 2004 Conference
09:00-12:30 City Tour
13:30-18:30 Round 3 WCCC
19:00-21:30 Speed Chess
13:30-21:00 Computer Olympiad

Wednesday July 7
08:30-13:00 CG 2004 Conference
13:30-18:30 Round 4 WCCC
19:00-21:30 Speed Chess
13:30-21:00 Computer Olympiad

Thursday July 8
09:00-14:00 Round 5 WCCC
15:00-20:00 Round 6 WCCC
10:00-20:00 Computer Olympiad

Friday July 9
09:00-14:00 Round 7 WCCC

Saturday July 10 Sabbath

Sunday July 11
09:00-14:00 Round 8 WCCC
15:00-20:00 Round 9 WCCC

Monday July 12
09:00-14:00 Round 10 WCCC
15:00-20:00 Round 11 WCCC

Computers and Games 2004 Conference

July 5-7, 2004, Ramat-Gan, Israel

PROGRAMME

DAY 1: Monday July 5
Session Chair: Nathan Netanyahu

08:30 – 09:00
Strategic Interactions in a Supply Chain Game
Joshua Estelle, Yevgeniy Vorobeychik, Michael P. Wellman, Satinder Singh, Christopher Kiekintveld, and Vishal Soni

09:00 – 09:30
*Rediscovering *-Minimax Search*
Thomas Hauk, Michael Buro, and Jonathan Schaeffer

09:30 – 10:00
**-Minimax Performance in Backgammon*
Thomas Hauk, Michael Buro, and Jonathan Schaeffer

10:00 – 10:15 Coffee break

10:15 – 10:45
Searching over Metapositions in Kriegspiel
Andrea Bolognesi and Paolo Ciancarini

10:45 – 11.15
The Relative History Heuristic
Mark H.M. Winands, Erik. C.D. van der Werf, H. Jaap van den Herik, and Jos W.H.M. Uiterwijk

11:15 – 11:30 Coffee break

11:30 – 12:00
The Challenge of Multi-Player Game Search
Nathan Sturtevant

12:00 – 12:30
Preventing Look-Ahead Cheating with Active Objects
Jouni Smed and Harri Hakonen

12:30 – 13:00
Generating an Opening Book for Amazons
Akop Karapetyan and Richard J. Lorentz

DAY 2: Tuesday July 6
Session Chair: Y. Björnsson

08:30 – 09:00
Opponent Modeling in Poker
D. Billings, M. Bowling, N. Burch, A. Davidson, R. Holte, J. Schaeffer, T. Schauenberg, and D. Szafron

09:00 – 09.45 (invited speaker)
Efficient Control of Selective Simulations
Brian Sheppard

09:45 – 10:00 Coffee break

10:00 – 10:30
Blockage Detection in Pawn Endgames
Omid David Tabibi, Ariel Felner, and Nathan S. Netanyahu

10:30 – 11:00
An External-Memory Retrograde Analysis Algorithm
Ping-hsun Wu, Ping-Yi Liu, and Tsan-sheng Hsu

11:00 – 11:30
Rule-Tolerant Verification Algorithms for Complete Chinese Chess Endgames
Haw-ren Fang

11:30 – 11:45 Coffee break

11:45 – 12:15
Searching for Compound Goals Using Relevancy Zones in the Game of Go
Jan Ramon and Tom Croonenborghs

12:15 – 12:45
Dao: a Benchmark Game
H.H.L.M. Donkers, H.J. van den Herik, and J.W.H.M. Uiterwijk

DAY 3: Wednesday July 7
Session Chair: H.J. van den Herik

08:30 – 09:00
Associating Shallow and Selective Global Tree Search with Monte Carlo for 9x9 Go
Bruno Bouzy

09:30 – 10:00
An Improved Safety Solver for Computer Go
Xiaozhen Niu and Martin Müller

10:00 – 10:30
Learning to Estimate Potential Territory in the Game of Go
Erik C.D. van der Werf, H. Jaap van den Herik, and Jos W.H.M. Uiterwijk

10:30 – 10:45 Coffee break

10:45 – 11:15
Locally Informed Global Search for Sums of Combinatorial Games
Martin Müller and Zhichao Li

11:15 – 11:45
Building a World Champion Arimaa Program
David Fotland

11:45 – 12:00 Coffee break

12:00 – 12:30
Incremental Transpositions
Bernard Helmstetter and Tristan Cazenave

12:30 – 13:00
Kayles on the Way to the Stars
Rudolf Fleischer and Gerhard Trippen

13:00
Closing Ceremony

BNAIC'04 Call For Papers

October 21-22, 2004, Groningen

The 16th Belgian-Dutch Conference on Artificial Intelligence (BNAIC'04) is organised by the Institute of Artificial Intelligence and Cognitive Engineering (ALICE) of the University of Groningen, under the auspices of BNVKI/AIABN (the Belgian-Dutch Association for Artificial Intelligence) and SIKS (the Dutch Research School for Information and Knowledge Systems). One of the special tracks at BNAIC'04 will be related to SNN (the Dutch Foundation for Neural Networks).

BNAIC'04 will be held on Thursday October 21 and Friday October 22, 2004 in conference center "Meerwold" in Groningen. It will be collocated with the workshop "AI in the wild: Cognition in dynamic environments" to be held on Wednesday October 20.

SUBMISSION INFORMATION

The conference aims at presenting an overview of state-of-the art research in artificial intelligence in Belgium and The Netherlands. Submissions of the following three types are invited:

TYPE A: REGULAR PAPERS

Papers presenting new original work. Submitted papers should not exceed a length of 8 pages. These papers will be reviewed on overall quality and relevance. A-Papers will be accepted for either oral or poster presentation. All accepted papers will be fully published in the proceedings.

TYPE B: COMPRESSED CONTRIBUTIONS

AI papers that have been accepted after June 1, 2003 for other refereed conferences or journals can be resubmitted and will be accepted as compressed contributions. Authors are invited to submit the officially published version (without page restriction) together with a one or two-page abstract. B-Papers will be accepted for either oral or poster presentation. The abstract of the paper will be published in the proceedings. Note that, as for BNAIC'03 but in departure from previous years, a separate author registration is required for each B-type contribution. Every author may submit at most 1 B-paper of which they are the corresponding author, and only if they do not submit any A-paper as corresponding author.

TYPE C: DEMONSTRATIONS AND APPLICATIONS

Proposals for demonstrations will be evaluated based on submitted demonstration summaries (in English) stating the following: the purpose of the system to be demonstrated, its user groups, the organisation or project for which it is developed, the developers, and the technology used. In addition, the system requirements and the duration (not exceeding 30 minutes) should be mentioned. Especially researchers from industry are encouraged to submit papers presenting their applications and experiences. The maximum size of demonstration summaries is 2 pages.

For all submission types, possible topics of submissions include, but are not limited to:

- multi-agent systems
- intelligent agents
- robotics
- logic in AI
- games
- search
- verification and validation
- logic programming
- knowledge-based systems
- knowledge representation
- knowledge management
- ontologies
- machine learning
- optimisation
- evolutionary algorithms
- neural networks
- knowledge discovery and data mining
- natural language processing
- cognitive modeling
- speech recognition
- handwriting recognition
- applications
- AI in law, music & art

Papers and demonstration summaries should be submitted electronically according to the instructions at the BNAIC'04 conference website. Submissions should be accompanied by a message stating the submission type (A, B, or C) and an abstract of the paper in plain text. Proper receipt of submissions will be acknowledged by e-mail. The deadline for submissions is June 1, 2004. Submission implies willingness of at least one author to register for BNAIC and present the paper. For each paper, a separate author registration is required. Authors keep the copyright of their submissions.

From this year onwards, the BNAIC proceedings will carry an ISSN series number, just like journals, magazines, and series of technical reports.

IMPORTANT DATES

Deadline for submissions: June 1, 2004
Notification of acceptance: July 23, 2004
Deadline for camera-ready papers: September 1, 2004

CONFERENCE WEBSITE

http://www.ai.rug.nl/conf/bnaic2004/

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First, please use the link to the journal and choose an article. Then click the 'continue' button on the right and login. Now you have access to the full text. In the frame 'full text access' you can choose between HTML and PDF. To open different articles please use the arrow boxes or click on 'publication' or 'issue'.

The access expires in December 2004.

Happy reading.

Call for Articles

Special Issue: Agents Organizations
Journal of the Brazilian Computer Society
(JCBS) ISSN 0104-6500

THEME

Agent organizations are an emergent area of Multi-Agent Systems (MAS) that relies on the notion of openness and heterogeneity of MAS and poses new demands on traditional MAS models. These demands include the integration of organizational and individual perspectives and the dynamic adaptation of models to organizational and environmental changes. Organizational self-design will play a critical role in the development of larger and more complex MAS. As systems grow to include hundreds or thousands of agents, we must move from an agent-centric view of coordination and control to an organization-centric one. Practical applications of agents to organizational modeling are being widely developed but formal theories are needed to describe interaction and organizational structure. Furthermore, it is necessary to get a closer look at the relation between organizational roles and the agents that fulfil them.

The overall problem of analyzing the social, economic and technological dimensions of agent organizations, and the co-evolution of agent and human social and personal structures in the organization, provide theoretically demanding, interdisciplinary research questions at different levels of abstraction. Organizational research is increasingly recognizing the advantage of agent-based and other AI models for gaining insight in organizational issues and in exploring dynamic processes and configurations. On the other hand, organizational research has been active in the field of organizational modeling for many years, and has developed insights and theories that are very useful for MAS researchers.

Recognizing the importance of the research in this area, the Journal of the Brazilian Computer Society is organizing a special issue on agents organizations. The primary focus of this special issue will be on high-quality original unpublished research, case studies, as well as implementation experiences.

TOPICS

The topics of this issue include, but are not limited to:

- Modeling multi-agent organizations
- Formal theories for roles, authority, delegation, empowerment, and entitlement in agent organizations
- Deontic aspects in agent organizations
- Social aspects of agent organizations
- Organization design, monitoring, and adaptation
- Coordination models and devices in agent organizations
- Communication and interaction in agent organizations
- Engineering organizational coordination
- Scaling and control issues in agent organizations
- Application of organizational theory to MAS
- Simulation, analysis and verification of dynamics of multi-agent organizations
- Dynamic, adaptive and emergent organizational structures and dynamics
- Practical application examples for (aspects of) agent-organization systems
- Applications of agent organizations to knowledge management, CSCW, workflow, etc.
- Implementation and tools for agent organizations
- Human-computer interaction in agent organizations

ABOUT THE JOURNAL

The Journal of the Brazilian Computer Society is the formal quarterly publication of the Sociedade Brasileira de Computação (Brazilian Computer Society), Brazil. Its aim is to publish original research papers, serving as a forum for disseminating innovative research in all aspects of computer science. The priorities of the journal are quality and timeliness. The journal also has an electronic version with free access through the Scielo Portal:
(http://www.scielo.br/revistas/jbcos/iaboutj.htm).

SUBMISSIONS

Submissions must be in English and should be no more than 20 pages long, including all text, figures and references. The final manuscript should be approximately 8000 words in length.

Page 1 should contain the article title (not more than 15 words), author(s), affiliation(s), keywords (not more than 6 keywords), abstract (no more than 250 words) and the name, fax number and complete mailing address (both postal and email) of the person to whom correspondence should be sent. All contributions will be acknowledged and refereed.

Please, send your submissions (pdf files) by email to jaime.sichman@poli.usp.br, with the Subject: JBCS Submission – Agents Organizations, according to the schedule below.

SCHEDULE

Submission due date:	31/10/2004
Notification of acceptance:	01/02/2005
Camera-ready paper due:	15/03/2005
Publishing:	06/2005

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CONFERENCES, SYMPOSIA WORKSHOPS

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

JULY 4, 2004
The 5th International Workshop on Strategies in Automated Deduction (STRATEGIES 2004). Cork, Ireland.
http://www-leibniz.imag.fr/~boydelat/Strategies04/

JULY 4-8, 2004
Second International Joint Conference on Automated Reasoning (IJCAR 2004). Cork, Ireland
http://4c.ucc.ie/ijcar/

JULY 4-8, 2004
The 9th Computer Olympiad, Ramat-Gan, Israel. Information: Johanna Hellemons, email: info@icga.org. Http://www.icga.org

JULY 4-12, 2004
The 12th WCCC, Ramat-Gan, Israel. Information: Omid David Tabibi, email: davoudo@cs.biu.ac.il. Http: //www.icga.org

JULY 5-7, 2004
The CG 2004 Conference, Ramat-Gan, Israel. Information: Yngvi Björnsson, Email: cg2004@ru.is. Http://www.ru.is/cg2004/

JULY 5-7, 2004
Third International Workshop on Social Intelligence Design (SID 2004). Enschede, The Netherlands.
http://parlevink.cs.utwente.nl/sid04.html

JULY 5-9, 2004
6th European Agent Systems Summer School. Liverpool, UK.
http://www.agentlink.org/happenings/easss/2004/index.html

JULY 10-11, 2004
A Workshop on Knowledge and Games. Liverpool, UK.
www.csc.liv.ac.uk/~sieuwert/knowledgegames

JULY 16-18, 2004
Sixth Conference on Logic and the Foundations of Game and Decision Theory LOFT6. Leipzig, Germany.
http://www.econ.ucdavis.edu/faculty/bonanno/loft6.html

JULY 18-21, 2004
The 8th World Multi-Conference on Systemics, Cybernetics and Informatics (SCI 2004). Orlando, Florida, USA.
http://www.iiis.org/sci2004/

JULY 19, 2004
The Third International Joint Conference on Autonomous Agents & Multi-Agent Systems (AAMAS 2004.) Declarative Agent Languages and Technologies (DALT). AAMAS'04 Workshop. New York, USA.
satchmo.cs.columbia.edu/aamas04/
http://centria.di.fct.unl.pt/~jleite/dalt04/index.htm

JULY 19-20, 2004
AAMAS 2004 Workshop on Agent Communication (AC2004) New York, USA.
http://www.cs.uu.nl/people/rogier/AC2004/

JULY 19-23, 2004
12th International Conference on Conceptual Structures (ICCS 2004): Conceptual Structures at Work. Huntsville, Alabama.
http://concept.cs.uah.edu/

JULY 25-29, 2004
Nineteenth National Conference on Artificial Intelligence. San Jose, USA.
http://www.aaai.org/Workshops/2004/ws-04.html

JULY 27-31, 2004
PDC 2004: The Eighth Biennial Participatory Design Conference. Artful Integration: Interweaving Media, Materials and Practices. Toronto, Canada.
http://cpsr.org/conferences/pdc2004/

JULY 28-30, 2004
Fourth International Conference on Web Engineering (ICWE'04). Munich, Germany.
http://www.icwe2004.org/

JULY 29 - AUGUST 5, 2004
16th International Conference on Systems Research, Informatics and Cybernetics (InterSymp-2004). Baden-Baden, Germany.
http://www.iias.edu

AUGUST 9-10, 2004
Second Australasian Workshop on Logic and Multiagent Systems (LAMAS 2). Auckland, New Zealand.
http://www.cs.otago.ac.nz/lamas2/

AUGUST 9-20, 2004
The Student Session of the 16th European Summer School in Logic, Language and Information (ESSLLI-2004). Nancy, France.
http://esslli2004.loria.fr/

AUGUST 16-20, 2004
Workshop: Semantic Approaches to Binding Theory.
http://www.linguistics.ucla.edu/people/schlenker/ESSLLI04.html

AUGUST 22-27, 2004
Sixteenth European Conference on Artificial Intelligence (ECAI 2004). Valencia, Spain.
http://www.dsic.upv.es/ecai2004/

AUGUST 22-27, 2004
18th IFIP World Computer Congress. The 1st International Forum on Sciences and Technologies of Information and Communication. Toulouse, France.
http://www.wcc2004.org

AUGUST 23, 2004
Second International Workshop on Authoring of Adaptive and Adaptable Educational Hypermedia at the AH'2004, Eindhoven, The Netherlands.
http://www.ah2004.org

AUGUST 23-24, 2004
The 4th International Cognitive Robotics Workshop. Valencia, Spain. (Co-Located with ECAI 2004).
http://www.ida.liu.se/~patdo/cogrob04/

AUGUST 23-26, 2004
International Conference on Adaptive Hypermedia and Adaptive Web-based Systems (AH'2004). Eindhoven, the Netherlands.
http://www.ah2004.org

SEPTEMBER 1-3, 2004
3rd International Conference on Entertainment Computing (ICEC 2004). Eindhoven, The Netherlands.
http://www.industrialdesign.tue.nl/conference/icec2004/index.php

SEPTEMBER 2-4, 2004
The IEEE International Symposium on Intelligent Control (ISIC'04). Taipei, Taiwan.
http://www.mk.ces.kyutech.ac.jp/isic04/

SEPTEMBER 6-10, 2004
12th IEEE International Requirements Engineering Conference (RE'04). Kyoto, Japan.
http://www.re04.org

SEPTEMBER 14-16, 2004
Middle Eastern Simulation Multiconference (MESM 2004). Amman, Jordan.
biomath.ugent.be/~eurosis/conf/mesm/mesm2004/temp.html

SEPTEMBER 18-22, 2004
The Eighth International Conference on Parallel Problem Solving from Nature (PPSN VIII). Birmingham, UK.
http://events.cs.bham.ac.uk/ppsn04/

SEPTEMBER 20-24, 2004
The 15th European Conference on Machine Learning (ECML) and the 8th European Conference on Principles and Practice of Knowledge Discovery in Databases (PKDD). Pisa, Italy.

http://ecmlpkdd.isti.cnr.itecmlpkdd@isti.cnr.it

SEPTEMBER 20-24, 2004
2004 IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT'04). Beijing, China.
www.maebashi-it.org/IAT04

SEPTEMBER 27-30, 2004
24th IFIP WG 6.1 International Conference on Formal Techniques for Networked and Distributed Systems (FORTE 2004), Madrid, Spain.
http://antares.sip.ucm.es/~forte2004

SEPTEMBER 27-30, 2004
The 1st International Conference on Quantitative Evaluation of SysTems (QEST 2004). Enschede, The Netherlands.
http://www.qest.org/

SEPTEMBER 27-30, 2004
9th European Conference on Logics in Artificial Intelligence (JELIA'04). Lisbon, Portugal.
http://centria.di.fct.unl.pt/~jelia2004

OCTOBER 4-6, 2004
ABIS04. Annual Workshop of the SIG Adaptivity and User Modeling in Interactive Systems of the German Informatics Society (GI). (In conjunction with LWA04 in Berlin).
http://lwa.informatik.hu-berlin.de/abis.php

OCTOBER 4-7, 2004
First Annual IEEE Communications Society Conference on Sensor and Ad Hoc Communications and Networks. Santa Clara, California
http://www.ieee-secon.org/2004

OCTOBER 4-8, 2004
12th Annual Meeting of the IEEE/ACM International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2004).
Volendam, The Netherlands
http://www.mascots-conf.org

OCTOBER 5, 2004
IT-developments in Medical Care. Heerlen, The Netherlands.
http://alumni.hszuyd.nl/IngenieursNetwerk/

OCTOBER 10-13, 2004
Special Session on Soft Computing in Distributed Optimization to be held at the 2004 IEEE System, Man, and Cybernetics Conference. The Hague, The Netherlands.
http://www.ieeesmc2004.tudelft.nl

OCTOBER 25-27, 2004
Sixth International Conference on Electronic Commerce, ICEC 2004: Towards a new services landscape. Delft, The Netherlands.
http://www.icec04.net/

OCTOBER 25-28, 2004
Sixth International conference on Cellular Automata for Research and Industry (ACRI2004).
Amsterdam, The Netherlands.
http://www.science.uva.nl/research/scs/events/ACRI2004/

OCTOBER 25-29, 2004
Fifth Annual Conference on Optical Networking and Communications (OPTICOMM 2004). San Jose, USA.
http://www.opticomm.org

OCTOBER 25-29, 2004
12th International Conference on Cooperative Information Systems (CoopIS 2004). Larnaca, Cyprus.
http://www.cs.rmit.edu.au/fedconf/

OCTOBER 28, 2004
International Workshop on Modeling Inter-Organizational Systems (MIOS 2004). Larnaca, Cyprus
http://wi-se.wiwi.uni-augsburg.de/MIOS04.php

NOVEMBER 1-4, 2004
The 2004 IEEE International Conference on Data Mining (ICDM'04). Brighton, UK.
http://icdm04.cs.uni-dortmund.de

NOVEMBER 4-6, 2004
FOIS-2004 International Conference on Formal Ontology in Information Systems. Torino, Italy.
http://www.fois.org

NOVEMBER 8-10, 2004
International Conference on Computer Games: Artificial Intelligence, Design and Education (CGAIDE 2004). Microsoft Campus, Reading, UK
http://www.scit.wlv.ac.uk/~cm1822/cgaide.htm

NOVEMBER 23-26, 2004
The 2004 IFIP International Conference on Intelligence in Communication Systems (INTELLCOMM'04). Bangkok, Thailand.
http://intellcomm2004.ait.ac.th

NOVEMBER 25-27, 2004
Game'On 2004. Location still unknown at time of printing.
http://biomath.ugent.be/~eurosis/

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