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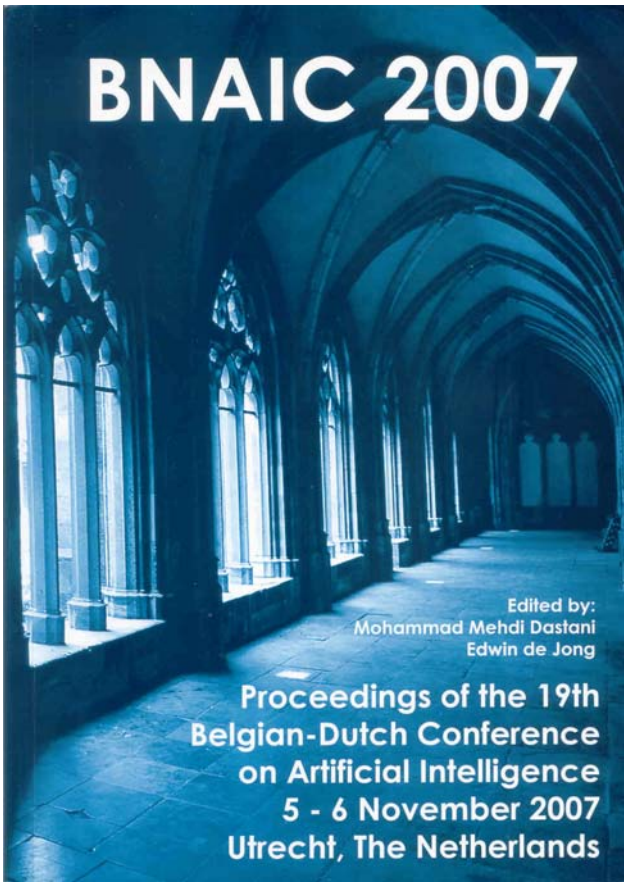

BNAIC 2007

Dariu Gavrila Receives I/O Award

Activity and Stabilization

News from the Belgium-Netherlands Association for Artificial Intelligence

Vivat, Crescat, Floreat BNAIC

Editor-in-chief

On November 5-6, 2007 the 19th Belgian-Dutch Conference on Artificial Intelligence, BNAIC 2007, was held in Utrecht. Organisers Edwin de Jong and Mehdi Dastani and their team did an excellent job. Not only was this edition of the BNAIC the largest ever, with 63 oral presentations, 34 poster presentations, 14 demonstrations, and not to forget some 175 registrations, it also was truly a splendid event. Partly responsible for the warm atmosphere was the beautiful location of the Academiegebouw. This issue includes eleven session reports by their chairs. The 39 full papers and 72 extended abstracts and demo abstracts were published in a good-looking book, edited by Dastani and De Jong. It gives an outstanding overview of the state-of-the-art research on AI in The Netherlands and Belgium.

The Academiegebouw.

The conference started with a very nice keynote lecture by dr. Pedro Domingos from University of Washington, Seattle, USA, entitled *Unifying Logical and Statistical AI*. He gave an overview of recent developments in the field of statistical relational learning, with a particular focus on his group's work on Markov Logic. During the second day even two keynote lectures were given. The morning started with a talk by Prof.dr. Michael Thielscher of Dresden University of Technology, Germany, on *General Game Playing*. A general game player is a program that is able to play arbitrary games based on formal descriptions without human intervention. He gave insight into the working of his group's program FLUXPLAYER, that won the Second General Game Playing Competition at AAAI-06 in Boston. At the end of the day Prof.dr. Nada Lavrac of the Jozef Stefan Institute, Ljubljana, Slovenia, gave an inspiring talk entitled *Contents and Co-authorship Analysis of ILP Publications Data*. She presented the results of several (semi-) automated data-analysis methods of a large, publicly available publication database. During the closing ceremony, prizes were awarded for the best paper to Markos Mylonakis and Khalil Sima'an for their paper *Translation Lexicon Estimates from Non-Parallel Corpora Pairs*, and to Tim Harbers, Rob van der Veen, and Marten den Uyl for their VICAVISION demonstration program.

Pedro Domingos

Michael Thielscher

Nada Lavrac

Meanwhile a new host for the next edition of the BNAIC is already known. During the last General Assembly Meeting the audience unanimously applauded the generous offer by Prof.dr. Anton Nijholt that his home institute, Twente University, is willing to host the BNAIC 2008. I sincerely hope that BNAIC 2008 may build on the success of BNAIC 2007.

Further it is my pleasure to introduce to you our new Section Editor for Belgium, or better, to let him introduce himself to you (see pages 129-130). He already proved to be very active, yielding several contributions in this issue by Belgian researchers. So I look forward to a fruitful cooperation.

With the success of the BNAIC 2007 fresh in mind I wish you all a very happy and prosperous year, in which I'm sure we will see many innovative (and provocative) ideas realized.

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Front cover: The BNAIC 2007 Proceedings, edited by Mohammed Mehdi Dastani and Edwin de Jong.

The deadline for the next issue is: **February 1, 2008**.

BNVKI-Board News

Antal van den Bosch

The statistics are devastating and leave no room for other interpretations: Dutch academia is an unfriendly place for women. The Netherlands is at the very base of the ladder when it comes to the percentage of female researchers. Only 11.6% of the full professors in the Netherlands is a woman. Belgium is doing a better job, but is also in the lower quarter of the scale. How are we contributing to these numbers as a field? The answer to that is shifting, it seems. The BNVKI board may be the best witness of this change, as the male faction of the board has become a minority the moment that new board member Annette ten Teije joined us. Also this year, the ECCAI has appointed our first female Fellow, prof.dr. Linda van der Gaag. Perhaps, hopefully, we will see more developments in this direction during the next few years of, well, let's dare to call it the presidency of Hillary Clinton.

The board, in the mean time, has taken the step to assign three specific portfolios (representing the different foci of our association) to individual board members. Of course we already had a chair, a secretary, and a treasurer, with their statutory tasks. We also have the chief editor of this newsletter in our midst. As of now we also have new board member Annette ten Teije taking special care of student affairs (such as BNAIS), Edwin de Jong taking the lead in advising the current BNAIC organization, and Marie-Francine Moens exploring the possibilities of PR and sponsoring.

With spirits high, we look forward to a great new year with great new advances in AI in the Low Countries. The board wishes you a very happy 2008!

Minutes of the BNVKI/AIABN General Assembly

Tuesday November 6, 2007
Utrecht, Netherlands

Ann Nowé

Present: Antal van den Bosch (Chair), Cees Witteveen, Edwin de Jong, Ann Nowé, Jos Uiterwijk, Sien Moens, and 20 members.

1. Opening
Chair Antal van den Bosch opens the meeting at 13:15.

2. Minutes of the BNVKI General Assembly October 6, 2006
The minutes are approved.

3. BNAIC'07
Edwin de Jong, co-programme-chair of BNAIC 2007, reports some facts about the conference. BNAIC'07 received 123 submissions (51 A, 58 B, 14 demo's), and counts 178 registrations. This year master students have been explicitly encouraged to submit their work. This has led to some nice contributions; however, some of these submissions clearly did not reach the level necessary for publication yet, and were therefore rejected. The master students could enrol at the strongly reduced rate of 50 Euro. Since this does not cover the real cost, the number of master student needed to be limited.

Mehdi Dastani raises the idea of organizing a special reviewing process for the master students' submissions. These submissions could for example be reviewed by Ph.D. students, and could be presented in a dedicated session.

Marc Denecker asks if the intention is to join with the BNAIS conference. The board states that this is not the case.

A student volunteer of BNAIC'07 remarks that students probably are not in favour of having such a separate session.

4. Financial report
Cees Witteveen, treasurer, reports on the financial situation of the BNVKI. The budget of 2007 could not be finalised yet, because the budget of BNAIC'06 is not finalised at this date. The balance of BNAIC'06 is for the present set to 0.

The budget of 2006 shows an expected positive balance of € 1955,-. The income is mainly composed of memberships, fees and sponsorship. The expenses are for the most part secretarial costs, newsletter printing and postage, ECCAI membership, and bank charges. Cees Witteveen remarks that the BNVKI increased the budget for sponsoring activities, such as seminars, tutorials and workshops. Proposals are still welcome.

5. Auditing committee
The auditing committee, consisting of members Ildiko Flesch (ICIS, Nijmegen) and Siegfried Nijssens (LIACS, Leiden), checked the financial report and accorded it. The meeting thanks Ildiko and Siegfried for their work and discharges them. Treasurer Cees Witteveen proposes for a new auditing committee, to check the financial report to be delivered at the next General Assembly, to

consist of Jan Struyf (KULeuven) and Rui Li (Leiden University). This proposal is accepted by the assembly.

6. BNVKI activity report

Antal van den Bosch reports on the activities of the past year *November 2006 - October 2007.*

Endorsements and sponsorships

- *Joint VOC-BNVKI meeting on Data Mining, Utrecht, April 27, 2007*
- *CGW-2007, Computer Games Workshop, Amsterdam, June 15-17, 2007*
- *NSVKI Student Symposium, Nijmegen, June 22, 2007*
- *ACAI Summer School, Leuven, August 20-28, 2007*

NSVKI: New initiative in the Netherlands

- *Student symposium (June 22, 2007)*
- *Organizing next BNAIS*
- *Student liaison board member*

BNVKI and ECCAI issues

- *New ECCAI Fellowships for BNVKI members*
  - *Prof.dr. Linda van der Gaag*
  - *Prof.dr. Marco Dorigo*
  - *Prof.dr. Frank van Harmelen*
- *AI Communications is free to all ECCAI members*
- *ACAI Summer School was a big success thanks to the PC: Hendrik Blockeel (LC), Maurice Bruynooghe, Danny De Schreye and Gerda Janssens*

7. BENELUX

There is a mutual proposal to include Luxembourg in the BNVKI society. Luxembourg has a growing AI community and is currently not represented in ECCAI.

The assembly is in favour of this proposal, however raises the following issues:

- If Luxembourg is included a change of name is necessary, and this has in the past been shown not an easy exercise, moreover this has to be reported at the notary and the Chamber of Commerce.
- The involvement of Belgium and especially the French speaking community remains difficult.

The assembly grants the board the permission to investigate this issue. The board will make a proposal, which will be published in the newsletter of August 2008. A final decision will be taken at the next General Assembly.

8. BNAIC'08

The board is happy to announce that Anton Nijholt of University of Twente has accepted to organize BNAIC 2008. Anton Nijholt prepared a nice presentation on the prospective venue. The assembly applauds the offer.

9. Board members and elections

As of this meeting, one board member, Cees Witteveen, will step down. The chairman thanks Cees Witteveen for his commitment and in particular for his efforts to make the BNVKI a healthy organisation. The board proposes Annette ten Teije as a new board member, which is unanimously approved by the Assembly.

10. End of meeting

There are no more comments or questions. The meeting is closed at 14:15.

New Section Editor for Belgium

Joachim De Beule

I am a post-doctoral researcher at the Artificial Intelligence Lab of the Free University of Brussels, headed by Luc Steels (see http://arti.vub.ac.be).

For about ten years now, members of our lab have been investigating the emergence and evolution of (artificial) languages. For example, Paul Vogt (1998) investigated the perceptual grounding of categories in robots; Bart de Boer (2000) worked on phonology; Steels *et al*. (2002) on lexicon formation and Steels and Belpaeme (2005) on colour terms. Most of this earlier work was concerned with lexical language, i.e., language that does not involve grammar. This is the focus of our current research: what is grammar for? How and why do languages become grammatical? What cognitive capacities are required for it? etc.

To answer these questions, we have developed *Fluid Construction Grammar*, a framework for supporting research on the emergence and evolution of grammatical language (see, e.g., De Beule and Steels (2005) and http://www.emergent-languages.org). It builds on insights gained in previous research and incorporates many ideas from different areas of Artificial Intelligence and (computational) Linguistics like machine learning, knowledge representation, construction grammar, etc.

The notion of grammar is of course very broad and covers many aspects of language. Several aspects were already investigated by members of our lab.

For example, Steels and Bleys (2005) investigated the role of second-order semantics and its relation to grammar while Steels and Wellens (2006) showed how grammar can emerge to dampen combinatorial search.

My own research recently led to a doctoral dissertation entitled "Compositionality, Hierarchy and Recursion in Language, a Case study in Fluid Construction Grammar". In it, I argue that certain productive features of language, like compositionality, get recruited by language users and hence by language itself simply because such features allow for more effective communication. A brief summary can be found in one of my latest publications (De Beule, 2008), which I will present at the 7th evolution of language conference. A draft version can be found via my web page (http://arti.vub.ac.be/~joachim).

Currently I am mainly continuing the development of FCG and my research on the emergence and evolution of grammar, a very interesting field in which already many things were achieved but still many more things remain to be done.

- Joachim De Beule (2008). The emergence of compositionality, hierarchy and recursion in peer-to-peer interactions. Accepted for the *Seventh International Conference on Evolution of Language*, Barcelona, March 11-15, 2008.
- Joachim De Beule and Luc Steels (2005). Hierarchy in fluid construction grammar. *Proceedings of the 28th German Conference on Artificial Intelligence,* KI LNAI 3698, Springer, Berlin, 2005.
- Bart de Boer (2000). Emergence of sound systems through self-organisation. In: Michael Studdert-Kennedy, James R. Hurford, Chris Knight (eds.), *The Evolutionary Emergence of Language : Social Function and the Origins of Linguistic Form*, 2000.
- Luc Steels and Tony Belpaeme (2005). The semiotic dynamics of colour. *Behavioral and Brain Sciences*, 28(4):515-529.
- Luc Steels and Joris Bleys (2005). Planning what to say: second order semantics for fluid construction grammars. In: *Proceedings of the 11th Conference of the Spanish Association for Artificial Intelligence* (*CAEPIA'05*). Berlin, Springer Verlag.
- Luc Steels, Frederique Kaplan, Angus McIntyre, Joris Van Looveren (2002). Crucial factors in the origins of word-meaning. In: A. Wray *et al.* (eds.), *The Transition to Language*. Oxford University Press. Oxford, 2002.
- Luc Steels and Pieter Wellens (2006). How grammar emerges to dampen combinatorial search in parsing. *Third International Symposium on the Emergence and Evolution of Linguistic Communication* (*EELC 2006*). Published in *Symbol Grounding and Beyond*, LNAI Volume 4211, Springer Verlag.
- Paul Vogt (1998). Perceptual grounding in robots. In: A. Birk and J. Demiris (eds.), *Proceedings of the 6th European Workshop on Learning Robots 1997*. Lecture Notes on Artificial Intelligence. Springer Verlag, 1998.

Dariu Gavrila Receives I/O Award

Christiane Klöditz
NWO

During the Scientific ICT Research Event Netherlands (SIREN) on October 30 the I/O award 2007 was handed out to Professor Dariu Gavrila, University of Amsterdam and PI of the ToKeN[1]-project CASSANDRA (Context-Aware SenSing for AggressioN Detection and Risk Assessment).

With this annual award the Board of the NWO Physical Sciences Council rewards the most far-reaching promotion of ICT-research of the previous twelve months. The jury selected Dariu Gavrila from seven nominees. He received the award for the publicity concerning his inaugural lecture on March 9, 2007 when articles in De Volkskrant and newspaper NRC were dedicated to his research. Furthermore, Gavrila's team won the "Best Paper Award" at this year's IEEE conference on surveillance AVSS for the presentation of CASSANDRA-research results.

The chairman of the programme committee ToKeN, Prof.dr. H.J. van den Herik, congratulates Dariu Gavrila with the I/O award.

[1] ToKeN – Access To Knowledge and its enhancement Netherlands

According to the jury Gavrila's research on the automatic detection of aggressive behavior and on the recognition of pedestrians by cars is socially important and scientifically highly advanced.

For more information about Dariu Gavrila and his research, see http://www.gavrila.net/.

BNAIC 2007 Conference

From November 5-6, 2007, the 19th Belgian-Dutch Conference on Artificial Intelligence (BNAIC 2007) was organized in Utrecht, The Netherlands, under auspices of the Belgian-Dutch Association for Artificial Intelligence (BNVKI) and the Dutch Research School for Information and Knowledge Systems (SIKS).

The conference was a great success. Below we present eleven session reports.

Session Reports

Applications

Report by Frans Voorbraak
Academic Medical Center, Amsterdam

In the Applications session four papers were presented. Two of them have the legal domain as application area, whereas the other two discuss biomedical applications.

The first paper of the session, presented by Susan van den Braak, was *Sense-making Software for Crime Investigation: How to Combine Stories and Arguments* by Floris J. Bex, Susan W. van den Braak, Herre van Oostendorp, Henry Prakken, Bart Verheij, and Gerard A.W. Vreeswijk. In this paper, the authors describe the design of a software tool for visualizing complex legal reasoning. This tool, called AVERs (Argument Visualization for Evidential Reasoning based on stories) combines two approaches to (legal) reasoning with evidence: the argumentative and the story-based approach. It does so by combining two AI approaches: abductive inference to the best explanation and defeasible argumentation. The goal of the tool is to allow crime investigators to visualize their reasoning about a case. The use of the software is illustrated by a simple ("toy") example of the King case (not the case of Rodney King, but that of Andrew King who allegedly attempted to burgle the Zomerdijk residence and was detected after making a sound by stepping on a toy). In the future the software will be tested on real cases.

The second paper, *Towards Automatic Identification of Completeness and Consistency in Digital Dossiers* by Martijn Warnier, Frances Brazier, Martin Apistola, and Anja Oskamp was presented by its first author. The paper discusses the advantages of digital criminal dossiers for Courts of Law and the Public Prosecution and it reports on a pilot study on digital dossiers at the Courts of Amsterdam and Rotterdam. In these dossiers information from many different organizations (Police, Public Prosecution, Probation officers, Child Welfare Office, Local Government, etc.) is collected. In the present state of the pilot study, paper documents from the different organizations are scanned and the resulting pdf files are incorporated in the digital dossiers. In the future the digital dossier is supposed to also contain XML-based machine-parseable documents. This will for example allow for automatic updating of information kept at the different organizations. The authors propose an agent-based management system of the distributed dossier, and sketch how software agents can help to obtain complete and consistent digital criminal dossiers.

The only regular (type A) paper of the session was *Towards the Automatic Registration of Histological Sections into a 3D Reference Model* by Bouke A. de Boer, Jan M. Ruijter, and Frans P.J.M. Voorbraak, presented by its first author. The application discussed in this paper is a preliminary version of a program for automatically fitting 2D images into 3D reference models. The 3D reference models are computer reconstructions of (mouse) hearts at different stages of embryonic development. The 2D images are images of tissue sections produced to visualize gene expression during the development of the heart. The interpretation of these 2D images can benefit greatly from seeing these images in their proper context in a 3D reference model. The paper shows how the use of relatively simple features considerably improves a basic, essentially brute-force, implementation of a matching algorithm based on the distance-based transform. This improvement concerns both a substantial speed gain (since much less comparisons have to be made) and, according to a team of experts, on average a considerably better registration of the 2D sections.

The last paper of this session was *The Role of Model Checking in Critiquing based on Clinical Guidelines* by Perry Groot, Arjen Hommersom, Peter Lucas, Radu Serban, Annette ten Teije, and Frank van Harmelen. In this paper, presented by Arjen Hommersom, a method is proposed for using model checking for critiquing medical-treatment plans by comparing the treatment plans of the doctor to (formalized) medical guidelines. A formalized medical guideline is taken as a description of a state-

transition system. It is then checked whether patient data together with actions in the treatment plans are consistent with the guideline model. If they are, the treatment conforms to the guideline and no critique is necessary. In case of an inconsistency, some further analysis is necessary to determine the kind of inconsistency (deriving from an action which should not be described, or only from a non-prescribed order of actions). The outcome of this analysis can then be used to give useful critique. The full paper describes an application of the method to a medical guideline for breast-cancer treatment, and the authors claim it provides additional value when compared to critiquing based on an operational guideline model.

Cognitive Modelling

Report by Jaap van den Herik
Universiteit Maastricht

The three presentations in the session Cognitive Modelling were complementary and a pleasure to follow. The first lecture was titled *Incorporating Emotion Regulation into Virtual Stories* by Tiber Bosse, Matthijs Pontier, Ghanzanfar Farooq Siddiqui, and Jan Treur. After a nice introduction on storytelling, virtual stories, and the characters involved, the audience was taken to the virtual environment created by the team of researchers. The main contents was the number of virtual agents that was equipped with a formalised model that regulated the emotions. The work continues the work by Gross (as published in the domain of psychology). In the presentation we saw a series of simulation experiments. They were compared with the behaviour described by Gross. The result was satisfactory and consistent. From the technical point of view it should be remarked that the simulation language was LEADSTO and that the Vizard Virtual Reality Toolkit was used.

The second lecture was titled *Modeling Visual Classification using Bottom-up and Top-down Fixation Selection* by Joyca Lacroix, Eric Postma, and Jaap van den Herik. The presentation dealt with the Natural Input Memory model (NIM), as developed by Lacroix for her Ph.D. thesis (defended in September 2007). NIM realizes a recognition-memory model that operates directly on real-world visual input (i.e., natural digitised images). An extension of NIM aims at adequately modelling visual classification. Therefore the model NIM-CLASS was developed. NIM-CLASS (1) adopts the NIM preprocessing stage and (2) introduces a new memory stage (i.e., the memory back-end) that makes classification decisions by comparing stored representations to incoming representations. The comparison is done by a nearest-neighbour method. The fixations of NIM-CLASS are made with a bottom-up mechanism that selects fixations on the basis of their visual selection (contours). To enhance the results, NIM-CLASS A was developed by introducing a top-down fixation selection mechanism for classification. The performance increased considerably. Future research should focus on the model's ability to deal with view invariance.

The third lecture was titled *Visual Object Representations: Comparing the NIM model with Brain Imaging Data* by Joost B.T. Wegman, Joyca P.W. Lacroix, Eric O. Postma, and Jaap M.J. Murre. This joint work is supported by four universities, viz. Nijmegen (Donders Centre), Leiden (Psychology), Maastricht (MICC-IKAT), and Amsterdam (Psychology). It is a continuation of Lacroix's Ph.D. resarch, performed by Joost Wegman. Even though Joost has just started research, he made a good and knowledgeable impression. He showed the first investigations on the neural plausibility of the NIM model. He did so by comparing NIM's representations with neural representations as measured by fMRI. The provisional conclusion was that internal representations of the NIM model have a similar structure as the distributed representation of the fMRI voxel data. This first result is rather promising and therefore we may expect future contributions on the BNAIC on variants of the NIM model.

Games

Report by Martijn Schut
Vrije Universiteit, Amsterdam

The Games session included four presentations. Firstly, Dujardin *et al*. presented a novel action-selection mechanism for multi-agent systems. The mechanism includes a number of general features that are defined either in the agent itself (e.g., goals, taste) or the environment (opportunism, achievement). The talk focused mainly on the concept of 'taste', which determines the preferences of the agent. Agents can for example be defined as grumpy or moderate, resulting in different decisions on taking actions. Validation of the mechanism in a video-game environment is under way.

Secondly, Borsboom *et al*. compared different Monte-Carlo (MC) methods for a variant of the game Go, called Phantom Go, where players do not see the moves of the opponent. The main contribution of the work is the application of one particular method, the MC tree-search UCT algorithm, to Phantom Go and the introduction of

two move-guessing heuristics for this algorithm. In a self-play experiment, two basic MC method and the two mentioned novel algorithms were compared. The experiment showed that the MC with all-as-first sampling was superior.

Thirdly, Donkers presented an analysis of the game of Dao with a demonstration of the (physical) game itself. This game was invented in 1999 and finds itself between trivial games like tic-tac-toe and games like Awari. The game itself is small enough to store it completely in memory, but the game graph is large enough for an interesting analysis. The central question in the presentation was why Dao is fun to play. The conclusion regarding this question is threefold: it is difficult to look ahead, a relatively large part of the game can be considered 'neutral', and in these neutral positions, mistakes can mean losing the game.

Finally, Saito *et al*. presented a method for grouping nodes in MC tree search (MCTS) for the game of Go. In standard MCTS, every tree node represents a single move. The new method also allows for nodes to represent groups of moves, making it possible to incorporate domain knowledge in the solution algorithm. A new method, alternating-layer UCT, is presented that intelligently maintains the two node types. A self-play experiment showed that the new method improves the playing strength of the MCTS algorithm.

Intelligent Agents

Report by Mathijs de Weerdt
Delft University of Technology

For the session on Intelligent Agents the organizers had put together a nice selection of four related papers on logical AI. Two presentations introduced ideas to deal with the problem of having a *dialogue* between an artificial agent and a (human) user, and two presenters proposed ways to deal with decisions on who or what to *believe*. I'll go through each of these in turn.

RESTART THE INTERNET, PLEASE!

First, Robbert-Jan Beun and Rogier van Eijk presented their approach to resolve misconceptions in dialogues such as people asking a helpdesk to "Restart the Internet, please!". Rogier illustrated this problem by an anecdote about his mother who could not find some of her Word documents on her own computer anymore. After he had spent some time at her computer during his last visit, she asked him: "Are my files now in Word?" He did not know how to respond.

However, together with Robbert-Jan he proposed a method that should be able to deal with such situations where an utterance by a user does not match the given world model. Their approach is to derive possible sources of the conceptual mismatch, and then translate these into questions for the user to resolve the mismatch.

WHAT TO BELIEVE?

The next talk by Gabrielle Pigozzi sparked a discussion about German intelligent agents during World War II. The problem considered in the presentation was the following. Suppose you receive some new information that conflicts with your current beliefs, which beliefs should you remove to return to a consistent belief base? The solution put forward in this presentation was to remove a subset of beliefs such that most (more important) obligations can still be met. But does this mean, for example, that if it is your obligation to follow the instructions given by the government, you should just delete the beliefs that suggest something else is happening than what this government wants you to believe? Maybe not, but for most practical applications, the proposed "obedient" agent model seems a good fit.

DO NOT BELIEVE THE MAFIA!

Hendrik Wietze de Haan was also interested in what to let civilians believe, but he started within a simpler context, i.e., a game called Mafia. In this game it is essential to find out which civilians (agents) belong to the mafia, because each night the mafia kills one of the civilians. Each day the agents are allowed to ask each other private questions, after which they vote on who should go to prison. To play this game well, it is essential to reason about which agents to believe, because agents (members of the mafia specifically) are allowed to lie. Hendrik Wietze applied Allard Tamminga's thesis work on Belief Dynamics to this game, proposed a couple of strategies for the civilians, and evaluated these experimentally.

THE FUTURE OF ICAT

In the final talk of this session (and of this first day of the BNAIC 2007) Bas Steunebrink argued that one of the most difficult problems to solve before we can really interact with intelligent agents is how to deal with the large number of modalities such agents can have to interact: for example an iCat can control its facial expressions, and has speech, vision, and hearing. In his talk he proposed a so-called dialogue *score* to represent complex interactions involving all such modalities. This model somewhat resembled a conditional (contingent) plan for the dialogue with parallel and synchronized actions. As Bas has set himself as a goal to get up to a point where the iCat is a really intelligent agent, he will be

combining not only methods for dialogues and belief revision, but also many other AI techniques. His talk therefore was an intriguing cliff-hanger for its sequels in upcoming BNAICs.

PRESENTATIONS

- *Conceptual Alignment in Human-Computer Dialogue: a Computational Approach*, by Robbert-Jan Beun and Rogier M. van Eijk
- *What You Should Believe*, by Guido Boella, Célia Da Costa Pereira, Gabriella Pigozzi, Andrea Tettamanzi, and Leon Van Der Torre
- *Using Belief Revision in Intelligent Agents*, by Hendrik Wietze de Haan, Wim H. Hesselink, Gerard R. Renardel de Lavalette, and Mark IJbema
- *Towards Programming Multimodal Dialogues*, by Nieske Vergunst, Bas Steunebrink, Mehdi Dastani, Frank Dignum, and John-Jules Meyer

Logic in AI

Report by Marie-Francine Moens
KU Leuven

In the Logic in AI session three very interesting papers were presented. First there were two presentations by the group of Marc Denecker of the Katholieke Universiteit Leuven, of which the first was *Approximate Query Answering in Locally Closed Databases* by Alvaro Cortés-Calabuig, Marc Denecker, Ofer Arieli, and Maurice Bruynooghe. A Local Closed-World Assumption expresses that the database is complete in a certain area. The paper introduces an algorithm for efficiently computing underestimations of certain query answers and overestimation of possible query answers in approximate query answering. The paper was published in the Proceedings of the 22nd National Conference on Artificial Intelligence (AAAI).

Secondly, the paper of Stephen Bond and Marc Denecker, entitled *I-Logic: An Intentional Logic of Informations* presented I-logic, a new formal language based on a subset of Montague's Intensional logic, in which the information in sentences can be treated as formal objects, and be precisely and unambiguously presented.

Finally, Martin Caminada of the University of Luxembourg presented *Two Unique Status Semantics for Formal Argumentation: Sceptical Preferred Approximation and Sceptical Semi-Stable Approximation*. The theory of argumentation has been studied extensively in logic and AI. The presentation focused on the question whether it is possible to define a unique extension semantics, called eager semantics, that is more credulous than grounded semantics and ideal semantics.

Machine Learning

Report by Bert Kappen
SNN, Radboud University Nijmegen

The first paper was from the University of Amsterdam by Mensink, Zajdel and Krose and concerned the problem of distributed EM in the context of a distributed camera system for tracking individuals. The authors show that statistics computed locally from the data samples that are collected at different cameras can be efficiently shared using the newscast approach and that this is sufficient to execute the M step at all cameras. Subsequently, each camera can then perform its own E step.

Goetschalckx and Ramon from KU Leuven propose a principled approach for the problem of discretizing the state space for continuous reinforcement Q-learning. Their idea is to introduce a distance in state-action space and to discretize according to this distance. If the distance is such that for any two pairs of state-actions the distance is larger than the difference of their respective Q values, they show that the error in the final solution is bounded by 2 epsilon/(1-gamma), with epsilon the size of the discretization and gamma the discount factor.

El Oufir and Voorbraak from the Amsterdam Medical Center propose to learn regulatory gene networks with Bayesian networks. They simulated genetic pathway data with GeneSim and used the publicly available program BANJO for structure learning of static and dynamic Bayesian networks. Their second experiment was to delete genes from a known metabolic-yeast network and used BANJO to fill in the gaps. They conclude that typical genetic data sets are too small to predict structure from scratch, but that missing genes can be predicted with some success.

Van der Maaten and Postma from the University of Maastricht address the problem of feature selection for texture classification. They reconsider a claim by Varma and Zisserman that image-based features are superior to filter-bank responses. Their experiments show that the difference is in fact not very large and that the superiority of image-based features is not evident. In addition, they show that orientation-invariant filter-bank feature sets dramatically outperform the image-based feature set when the textures are rotated.

Multi-Agent Systems

Report by Leon van der Torre
University of Luxembourg

Distributed Task Allocation in Social Networks, by Mathijs de Weerdt, Yingqian Zhang, Tomas Klos

Social networks are popular to model social phenomena on the web, but their analysis is usually restricted to graph-theoretic properties. Mathijs de Weerdt explains how he and his co-authors adapted task-allocation models and algorithms for social networks. The social dimension of task allocation is that agents can use only resources of their "friends", i.e., of other agents to which they are connected in their social network. They prove that the complexity of the social task-allocation model is the same as the complexity of the task-allocation model, i.e., NP complete. They also propose a greedy algorithm, and a simulation illustrates its good performance.

Adaptation of Organizational Models for Multi-Agent Systems based on Max Flow Network, by Mark Hoogendoorn

The problem of organizational change has already attracted a lot of attention in the area of multi-agent systems, because the metaphor of organizations is a useful abstraction of such systems only if the organizations can specify the way in which they can change. Mark Hoogendoorn uses max flow networks to model the change of organizations. This model focuses on the capacity management of organizations, and uses graph-theoretic tools. Mark shows how to introduce the max-flow approach in one of the older organizational models called the Agent-Group-role or AGR model, and uses it to illustrate how max-flow algorithms can be used for organizational change.

Coordinating Competitive Agents in Dynamic Airport Resource Scheduling, by Xiaoyu Mao, Adriaan W. ter Mors, Nico Roos, Cees Witteveen

Airplanes in an airport can be covered by snow and ice, which must be removed before the airplane takes off. Since such called deicing activities may be required only a few days a year in countries with a moderate climate like the Netherlands or Belgium, there is typically only a limited deicing capacity, and planning and scheduling techniques must be used to optimize the use of this capacity. Xiaoyu Mao and his co-authors introduce and analyze two agent-based scheduling architectures for the deicing problem, the first based on decommitment penalties, the second on a Vickrey auction. Experimental results show that the former is more fair, but the better leads to less delays.

A Formal Framework for Modeling and Analysis of Organizations, by Viara Popova, Alexei Sharpanskykh

Enterprise architectures typically model organizations using informal tools, for example using visual formalisms. To analyze enterprise architectures formal languages are used such as architecture-description languages (ADLs), or conceptual-modeling languages like description logics. Viara Popova and Alexei Sharpanskykh introduce a formal language based on Treur's Temporal Trace Language. The framework has been applied in a number of case studies, for example from the security domain.

Natural Language & Speech

Report by Antal van den Bosch
Tilburg University

This session dealt with two technologies: machine translation, and handwriting recognition. The first paper, *Translation Lexicon Estimates from Non-Parallel Corpora Pairs* by Markos Mylonakis and Khalil Sima'an, proved at the end of the day to be the winner of the best-paper award. And rightfully so; their paper presented a highly original solution to the rather vexing problem of estimating translation lexicons for a pair of languages, when the training corpora available for the two languages are actually not translations of each other (a realistic scenario). The key innovation of their work is to improve the language model in their statistical MT system, by applying a bidirectional version of EM (the Baum-Welch algorithm applied to Hidden Markov Models) on a joint likelihood of two separate corpora, that can be two disjoint corpora in two different languages. The end results, on translating German noun sequences to English, show that bidirectional EM re-estimation provides significantly better bilingual lexicons, and thereby translations, than using the standard unidirectional EM.

The other two presentations were on handwriting recognition. The first, *Writer Identification by Means of Explainable Features: shapes of loop and lead-in strokes*, by Vivian Blankers, Ralph Niels, and Louis Vuurpijl, provided an interesting account of writer-identification experiments where an important subgoal was to explain the automatically generated decisions to human forensic experts. The preferred route of explanation is by similarity to visual tell-tale signs of authorship: the study focused

on the shape of loops and of lead-in strokes. Results show that identifying writers is quite well possible based on a sufficient amount of identical letters to match with (e.g., 95% accuracy by a *k*-nearest neighbor classifier on the basis of letters when at least 30 of the same letters of each writer were known). The study interestingly showed that matching does not need to be based on identical letters, since loops and lead-ins are features that can to some extent be seen as independent from the actual letters they are realized on.

The third presentation, *Semi-Supervised Methods for Handwritten Character Recognition using Active Learning*, by Leonidas Lefakis and Marco Wiering, focused more on the technical aspects of Active Learning, using benchmark data sets of handwriting-recognition problems. Lefakis and Wiering presented an impressive series of experiments, where a simple generic *k*-NN and *k*-means based learner was compared against more sophisticated algorithms: using auto-encoders, and using feature mapping and sub-sampling the feature maps.

Ontologies

Report by Frank van Harmelen
Vrije Universiteit, Amsterdam

Even though ontologies featured in many talks, there was only one session labelled as such. The session proved to cover the entire scale between theory and practice, and between theorems and experiments.

The first paper (*Inconsistencies, Negations and Changes in Ontologies*, by Giorgos Flouris, Zhisheng Huang, Jeff Z. Pan, Dimitris Plexousakis, and Holger Wache) started with the observation that (of course) ontologies change, but (unfortunately) the best known theory of change in logical theories (the AGM theory of belief revision) does not apply to ontologies because typically the logic in which ontologies are expressed (Description Logics) are not closed under negation. This makes the AGM postulates not applicable to the DL case. The paper proposed a way of fixing this by introducing different forms of negation into DLs, together with a modified form of the AGM postulates. These new postulates were shown to be intuitively satisfactory, and also to satisfy the important Harper-Levi identities (which are usually taken as a minimal quality requirement for belief-revision frameworks).

The second paper (*Using Google Distance to Weight Approximate Ontology Matches*, by Risto Gligorov, Zharko Aleksovski, Warner ten Kate, and Frank van Harmelen) was combined work by Philips Research and the Vrije Universiteit. The authors argue that the world is full of imprecise vocabularies, and we had better think of semantic-integration techniques that also work for such imprecise vocabularies. The paper shows how a semantic distance function based on results from Web-search engines can be used to determine which parts of the vocabulary are the important parts that should decide integration queries, and which parts of the vocabulary can be safely ignored. They showed experimentally that such a web-based heuristic for integration does indeed improve results over treating all parts of the vocabulary as equal.

The third paper (*Agent-based Analysis of Organizations: Formalization and Simulation*, by Virginia Dignum and Christiaan Tick) did not take ontologies to be its research topic, but instead used an ontology (in combination with agent technology) to solve a particular problem, namely that of modelling the performance of organisations, and to predict whether a given reorganisation would lead to improved performance.

Optimization

Report by Marco Wiering
Utrecht University

The first presentation in the Optimization session was by Nyree Lemmens, Steven de Jong, Karl Tuyls, and Ann Nowé and was entitled *Bee System with Inhibition Pheromones (BSP)*. In the beginning it was made clear that although Ant Systems can be efficient to solve foraging problems, a difficulty is that the pheromones laid down by the ants stay a long time in the environment which makes application to changing environments difficult. Another approach is a Bee System which models the typical foraging behavior of a bee, where a dance is performed by a bee to show others the direction and distance to a discovered food source. A problem of the Bee System is that paths can be obstructed, making the direction and distance not suitable for entities that cannot fly over obstacles. Furthermore, the Ant System can be shown to be more adaptive than the Bee System. To solve the problems of the Bee System, the authors proposed to use inhibition pheromones which disencourages the agent to take a path that will lead to an obstruction. The result is a BSP which is claimed to be more adaptive than the Ant System. Some experiments on foraging tasks with changing environments demonstrated the utility of the BSP.

The second presentation was by Rui Li, who showed work done in cooperation with Jeroen Eggermont,

Michael Emmerich, Ernst Bovenkamp, Thomas Bäck, Jouke Dijkstram and Johan Reiber. The presentation was entitled *Towards Dynamic Fitness Based Partioning for IntraVascular Ultrasound Image Analysis*. The talk started with describing that the usual approach of manual segmentation of medical images is not only costly, but also senstive to intra- and intervariabilities. Therefore there is a need for automatic multi-agent image-interpretation systems. In general good feature detectors can be constructed, but to let them work well many parameters have to be optimized. The authors do this parameter optimization with mixed-integer evolutionary algorithms that can handle continuous and ordinal variables. Only optimizing the parameter of a feature detector leads to several problems: different parameters are needed for different segmentation contexts, and there is no natural distance function to group images requiring the same parameters together. The solution proposed by the authors is to have a multi-agent system with multiple parameter solutions and to dynamically divide the trainingset. Since there is no natural distance function, the fitness on the training images of the different agents is observed and based on this several clusters are constructed.

The third presentation was by Thomas van Dijk and was entitled *Kernelization for Loop Cutset*. Thomas started out discussing the Feedback Vertex Set, since the Loop Cutset problem is a variation of it. The question that needs to be addressed in the Feedback Vertex Set problem is the following: Suppose there is an undirected graph and an integer k. Can one remove k nodes so that this set of nodes contains at least one node of every cycle? This problem is known to be NP-complete. The Loop Cutset is a bit different, since now there is an acyclic graph and the question is whether k nodes can be removed from all simple loops so that this set of nodes contains vertices that are not sinks. This problem plays a role in inference techniques for Bayesian networks. Thomas presented a Kernelization approach which is basically a preprocessing technique with a performance guarantee. The kernelization that Thomas showed consisted of many different rules where rules are applied on the graph until none could be applied anymore. This can lead to a significant reduction of the size of the graph. Experiments showed an improved runtime with kernelization and solving the kernel instead of solving the initial graphs.

The final presentation in the optimization session was by Antal van den Bosch and Ko van der Sloot and was named *Superlinear Parallelization of K-nearest Neighbor Retrieval*. Finding the K-nearest neigbors to a datapoint with a naive algorithm costs $O(nf)$ where n is the number of examples and f is the number of features describing an instance. Several methods were proposed to use parallel computers that speed up this retrieval. One method is to split the training examples in groups and to retrieve the K-nearest neighbors using different processors on the smaller set of training examples, and to merge the results together. Then Antal spoke about a particular retrieval algorithm for a single processor which is based on Knuth's Trie Compression. Here a tree is constructed where the features are ordered and the data is indexed with the features. Then by moving up and down in the tree, the nearest neighbors can be found. The new work lies in the parallelization of this technique. The method was chosen that partitions the training examples in smaller groups. Experiments performed on natural-language processing problems showed that parallelization could in some cases lead to a superlinear speedup. The reason was that the method used for finding the K-nearest neighbors, although often quite efficient, could sometimes lead to exponential search costs. By making the training set smaller for a processor, superlinear gain could be achieved.

Robotics

Report by Frans Groen
Universiteit van Amsterdam

In the first presentation, Tibor Bosse (VU Amsterdam) discussed a cognitive model for visual attention and its applications. The paper had previously been presented at the Intelligent Agent Technology conference in 2006 and was co-authored by Peter-Paul van Maanen (also TNO Human Factors) and Jan Treur. Although the paper was presented in the robotics section, it had no direct relation to robotics.

In naval command, an information overload is often present and a software agent may support warfare officers dealing with parallel tasks in compiling a tactical picture of the situation. To that end an appropriate work division between the officer and the agent is required. In order to determine to which subtask the agent has to pay attention to, an estimate of the user's attention is needed. A simulation study based on a cognitive model of visual attention was presented. The simulation is based on data from a case study in which a user executed an abstracted naval radar-track identification task. The simulation data consist of two types of information: dynamics and properties of radar tracks and the user gaze behavior using an eye-tracker. Based on this information the cognitive model estimates the distribution of the attention levels over the tracks of the radar.

The second paper on *Static versus Plastic Controllers in Evolutionary Robotics* (MICC, Maastricht University) was unfortunately not presented due to illness of the speaker.

The third paper on *Embodied Modeling of the Organization of the Brain* was presented by Ida Sprinkhuizen-Kuyper and co-authored by Joris Janssen, Twan Goosen and Pim Haselager (Radboud University and NICI). Starting point of the paper were questions like: why does our brain consists of two hemispheres and why are some functions symmetrically and others asymmetrically organized. In the presented study, experiments are done with robots with a symmetric and an asymmetric body plan. The robots differ in the placement of the light sensors and the activation of the motors driving the robot. The robots are controlled by a 3-layer neural network. The task is to drive around in an arena as fast as possible. After learning the task, the neural network (control structure) is analyzed by a clustering method. The results show that robots with a symmetric body plan develop a more symmetric control structure than robots with an asymmetric body plan. Robots with a symmetric body plan evolve faster but robots with an asymmetric body plan perform better in the end.

The last paper, *Interleaving Simulated and Physical Environments Improves Evolution of Robot Control Structures*, was presented by Twan Goosen ad co-authored by Rik van den Brule, Joris Janssen and Pim Haselager and originated from the same group as the third paper. Control structures for physical robots can be evolved in simulated and real-world environments. Simulation is easier and faster but only an approximation of reality. In this study the result of interleaving a simulated and physical environment during the evolution of a control structure was examined. Lego Mindstorms robots were used in the experiments. The task was the same as in the previous paper: to drive around an arena as far as possible. Two experiment setups were presented. Fine-tuning using 55 evolutions in simulation followed by 5 evolutions in real world and interleaving: 55 evolutions interleaved between simulation and the real world again followed by 5 real-world evolutions. Results show that interleaved evolution performs better than the fine-tuning. New experiments were announced were in the comparison the same number of evolutions in the real world and in simulation were used.

The 2007 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 Demo-session of the BNAIC 2007. The referee committee consisted of Jaap van den Herik (chair), Maurice Bruynooghe, Annette ten Teije, and Cees Witteveen.

The referee committee had to consider thirteen submissions which were eligible for the SKBS Prize. In Table 1 we list them by author (in the order of their publication in the Conference Program BNAIC 2007; the withdrawal of Silvie Spreeuwenberg and Jeroen Heijmans' submission due to the flu is taken into account).

(1)	Ton Weijters, Wil van der Aalst, Boudewijn van Dongen, Christian Günther, Ronny Mans, Ana Karla Alves de Medeiros, Anne Rozinat, Minseok Song, Eric Verbeek. *Process Mining with ProM*.
(2)	Laurens J.P. van der Maaten, Paul J. Boon. *Fast and Reliable Coin Classification*.
(3)	Laurens J.P. van der Maaten. *Matlab Toolbox for Dimensionality Reduction*.
(4)	Mehdi Dastani, Christian Mol, Nick Tinnemeier, John-Jules Meyer. *2APL: A Practical Agent Programming Language*.
(5)	Jochem Liem, Bert Bredeweg, Anders Bouwer, Floris Linnebank. *Garp3 – Workbench for Qualitative Modelling and Simulation*.
(6)	Michel A. Oey, Reinier J. Timmer, David G.A. Mobach, Benno J. Overeinder, Frances M.T. Brazier. *WS-Agreement Based Resource Negotiation*.
(7)	Arno Knobbe. *The Safarii Multi-Relational Data Mining Environment*.
(8)	Tim van Kasteren, Ben Kröse, Taylan Cemgil. *Realtime Simultaneous Tempo Tracking and Rhythm Quantization in Music*.
(9)	Han Noot, Valentin Robu, Han La Poutré, Willem-Jan van Schijndel. *An Interactive Demonstrator for Auction-Based Allocation of Loads in Transportation Logistics*.
(10)	Bas Terwijn, Athanasios Noulas. *BNAIC Demo: Online Speaker Detection by the iCat Robot*.
(11)	Wouter Roelofs, Franc A. Grootjen. *NavCon, Navigating the Conceptual Space*.
(12)	Tim Harbers, Rob van der Veen, Marten den Uyl. *Sentient Demonstration BNAIC 07*.
(13)	Tamás Máhr, Brigit Lichtenegger. *Transportation Planning with Humans and Agents*.

Table 1: The 2007 candidates of the SKBS prize.

Since 1999 we have seen many different appearances of the Demo-session. The common characteristic is the emphasis in being "an industrial exhibition". Up to 2006 the prize money was provided by SKBS only. The Foundation for Knowledge Based Systems originates from the late 1980s as a foundation within SPIN (Stimulering Projectteam In Nederland). The Foundation SNN (Stichting Neurale Netwerken) is another well-known member of the former SPIN. In 2007, two other industrial partners announced their willingness to participate in the prize funding. They were SKF Benelux and Sentient Information Systems. Their contribution was gratefully received and the organisation decided to have a prize of 500 euro for the industrial exhibition and 500 euro for the best paper (see elsewhere).

In 2007, the thirteen submissions were gathered in the beautiful reception room of the Academy building of the Utrecht University. Contrary to 2005 and 2006 there were no introductory lectures, but only full-fledged demonstrations. There were moving images, musics, robots, and many handouts. It was really a pleasure to walk along the demos and to discuss with the standholders. Clearly, the quality has grown considerably over nine years, in particular over the last five years (e.g., online speakers detection). Sentient Demonstration BNAIC 07 had even three demos on its exhibition table, viz. (1) Parabots, (2) Vicavision, and (3) Police Datamining.

The referee committee had a difficult task. The procedure went in shifts: from 13 we reduced the number of candidates to seven and then to three. The remaining three were (9) Han Noot *et al*., (10) Bas Terwijn *et al*., and (12) Tim Harbers *et al*.

Finally, the members of the referee committee were invited to score on (a) the quality of the submission, (b) the originality, (c) the scientific element, (d) the relations within AI, and (e) the applicability (in industry or education). The spirit of the SKBS prize is in criterium (e). If only criterium (b) had been applied then the iCat Robot would have won, even so we agreed that criterium (e) only would have led to the Transportation logistics. However, the referee committee unanimously voted for Sentient as winner of the 2007 SKBS prize. Of course, there had been a discussion on their participation with one demo or three demos. The prize was for Vicavision. Parabots received a compliment and the Police Datamining was given encouragements since it was considered to be in its infancy, but actually also coined as promising. There was a general feeling, not only among the members of the referee committee, but also in the audience that Sentient deserved this SKBS prize, since it had participated over many years with high-quality submissions. This time, it was their time. Congratulations for Marten den Uyl.

In Table 2 we provide an overview of the winners of the SKBS prize so far.

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 Support System*
2004 Groningen Wouter Teepe *The Secret Prover: Proving Possession of Arbitrary Files While not Giving Them Away*
2005 Brussels Gerald de Jong *Fluidiom: The Evolution of Locomotion*
2006 Namur Marion Verduijn, Niels Peek, Peter Rosseel, Evert de Jonge, and Bas de Mol *Procarsur: A System for Prognostic Reasoning in Cardiac Surgery*
2007 Utrecht Tim Harbers, Rob van der Veen, Marten den Uyl *Sentient Demonstration BNAIC 07: Vicavision*

Table 2: Overview of SKBS prizes.

PH.D. THESIS ABSTRACTS

Self-Assembling Robots

Ph.D. thesis abstract
Roderich Groß

Promotor: Prof.dr. M. Dorigo (ULB)
Date of defense: October 12, 2007

In this thesis, we look at robotic systems made of separate discrete components that, by self-assembling, can organize into physical structures of growing size. We review 22 such systems, exhibiting components ranging from passive mechanical parts to mobile robots. We present a taxonomy of the systems, and discuss their design and function.

We then focus on a particular system, the swarm-bot. In a swarm-bot, the components that assemble are self-propelled modules that are fully autonomous in power, perception, computation, and action. We examine the additional capabilities and functions self-assembly can offer an autonomous group of modules for the accomplishment of a concrete task: the transport of an object. The design of controllers is accomplished in simulation using techniques from biologically-inspired computing. We show that self-assembly can offer adaptive value to groups that compete in an artificial evolution based on their fitness in task performance.

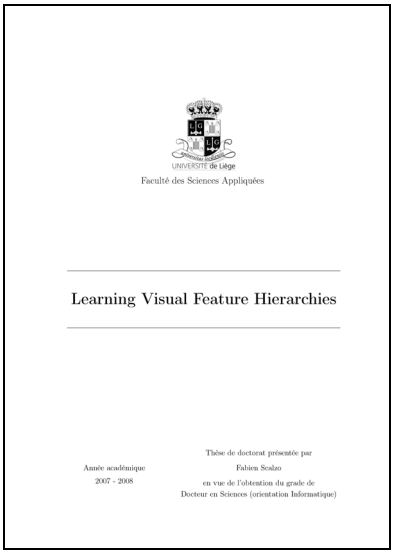
Moreover, we investigate mechanisms that facilitate the design of self-assembling systems. The controllers are transferred to the physical swarm-bot system, and the capabilities of self-assembly and object transport are extensively evaluated in a range of different environments. Additionally, the controller for self-assembly is transferred and evaluated on a different robotic system, a super-mechano colony. Given the breadth and quality of the results obtained, we can say that the swarm-bot qualifies as the current state-of-the-art in self-assembling robots.

Our work supplies some initial evidence (in form of simulations and experiments with the swarm-bot) that self-assembly can offer robotic systems additional capabilities and functions useful for the accomplishment of concrete tasks.

Learning Visual Feature Hierarchies

Ph.D. thesis abstract
Fabien Scalzo

Promotor: Prof.dr. J.H. Piater (ULG)
Date of defense: December 4, 2007



This dissertation addresses the problem of recognizing objects in images. Representation, detection and learning are the main issues that need to be tackled in designing an object-recognition system. Despite more than 20 years of research, this field still remains very challenging and generic aspects of the problem are largely unsolved. This thesis proposes a framework for the statistical representation of visual features (from which objects are constituted) and their detection in images. The model essentially combines several key concepts that have been developed in the last couple of years in computer vision, machine learning and computational neuroscience; spatial relations

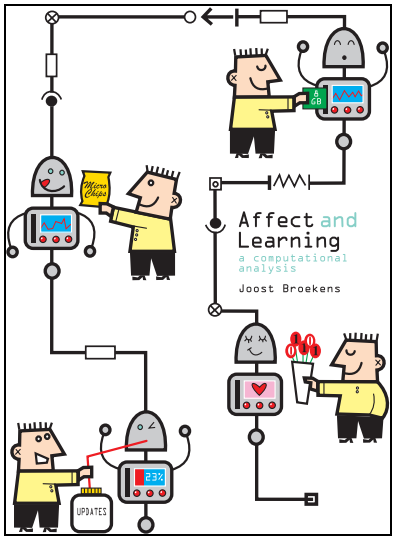
between local visual features, graphical models and hierarchies of complex cells. This results in a compositional hierarchy of visual-feature classes. Its strength is to provide a coherent and generic model by representing both local and global aspects through the combination of shape and appearance modalities. Interestingly, the use of graphical models provides a convenient formalism to represent complex systems and to exploit efficient inference mechanisms.

In this work, we exploit an iterative message-passing algorithm to infer the position of features and thus to detect objects; namely Nonparametric Belief Propagation (NBP). The hierarchical model is learned iteratively and composed in a bottom-up manner. A co-occurence learning method is used to estimate both the structure and the parameters of the hierarchy. We also summarize the state-of-the-art with respect to the detection and the description of local visual features. Finally, the behavior of our feature hierarchies is investigated across a variety of object-recognition datasets. These experimental evaluations are organized around three recognition tasks of increasing difficulty.

Affect and Learning: A computational analysis

Ph.D. thesis abstract
Joost Broekens

Promotor: Prof.dr. J.N. Kok (UL)
Date of defense: December 18, 2007



In this thesis we have studied the influence of emotion on learning. We have used computational modelling techniques to do so, more specifically, the reinforcement-learning paradigm. Emotion is modelled as artificial affect, a measure that denotes the positiveness versus negativeness of a situation to an artificial agent in a reinforcement-learning setting. We have done a range of different experiments to study the effect of affect on learning, including the effect on learning if affect is used to control the exploration behaviour of the agent and the effect on learning when affect is communicated by a human (through real-time analysis of that human's facial expressions) to a simulated robot. We conclude that affect is a useful concept to consider in adaptive agents that learn based on reinforcement learning and that in some cases affect can indeed help the learning process. Further, affective modelling in this way can help understand the psychological processes that underlie influences of affect on cognition. Finally, we have developed a formal notation for a specific type of emotion theory, i.e., cognitive appraisal theory.

Activity and Stabilization

Jaap van den Herik
MICC-IKAT, Maastricht

The interpretation of discrete observations is only possible over a sufficiently long period of time. For fourteen years the BNVKI Newsletter is announcing Ph.D. theses that are related to the AI Community. Since 1998 we are separately counting the SIKS Ph.D. theses. In both lines we see a clear increase. However, global increases may face now and then a "local" decrease. In an attempt to analyse the numbers as published in Table 1 in a meaningful way I propose to divide the time span of fourteen years into three Groups of 6, 4 and 4 years. This means that Group A ranges from 1994 to 1999, Group B from 2000 to 2003, and Group C from 2004 to 2007.

Year	# of Theses	# of SIKS Theses
1994	22	-
1995	23	-
1996	21	-
1997	30	-
1998	21	5
1999	28	8
2000	19	11
2001	25	11
2002	33	17
2003	37	18
2004	45	20
2005	45	21
2006	54	28
2007	**46**	**25**
Grand Total	**449**	**164**

Table 1: Scores and grand total.

The averages for the number of all theses over the Groups are as follows. Group A: 24, Group B: 28, Group C: 47. Obviously, there has been many Ph.D. activities over the whole period (with an average of 32 theses over fourteen years) and currently, we are in a state of stabilization, since our score of 2007 amounts to 46 (the average of Group C being 47).

SIKS

For SIKS we may take a similar subdivision. Group D: up to 1999, Group E: 2000 to 2003, and Group F: 2004 to 2007. Then we see as figures for Group D: 6, Group E: 14, Group F: 23 (for all who perform a checking of my calculations, I round off 23.5 to 23, see also above). Here I should reiterate the compliments of last year to the SIKS management (Dr. Richard Starmans) and the SIKS directors Prof. Meijer (former Director) and Prof. Wieringa (current Director) since the number of theses is also owing to their continuous efforts to organise Ph.D. courses, ordinary courses, and advanced courses. Knowledge is the basis for every Ph.D. student and in acquiring this knowledge the SIKS Graduate School has shown to be pivotal.

These numbers together with the quality of the theses produced are of eminent importance for the reconfirmation procedure that will take place in 2008. I wish the SIKS Board, the SIKS Director and Manager as well as the SIKS secretariat much success in the months to come. The composition of a "self study" is a task that requires enthusiasm, diligence, and a dosis optimism to handle the obstacles that will show up unexpectedly. Under the heading "SIKS promovendi 2007" we provide a full list of the SIKS promotions in this year.

A General View

The 46 Ph.D. thesis announcements are related to the following domains: (1) Artificial Intelligence, (2) AI and Law, (3) AI and Medicine, (4) AI and Economy, (5) AI and Civil Engineering, (6) AI and Computer Science, (7) AI and Information Sciences, (8) AI and Logic.

From this enumeration the reader can see that AI is nowadays an intrinsic part of many other disciplines. So far, the end of the list is not foreseeable. Let me give an example. The Netherlands Bioinformatics Centre (NBIC) has bundled its research activities in a research body called NBIC. Obviously, Bio Informatic researchers use all kinds of AI techniques.

In their list of Ph.D. theses to be announced I saw two titles with names of promovendi that I would like to include in our list of announcements of January 2008. However, the information was not complete. I am now negotiating with the NBIC Director Ruben Kok to provide me with the precise data. The two titles are *A Bioinformatics Approach to Marker Development* by Jifeng Tang (January 8, 2008) and *Text Mining Applied to Molecular Biology* by Rob Jelier (January 10, 2008). NBIC participates in Genomics and BIG GRID. So, the AI research community may broaden its scope in 2008. We will see the figures at the end of the year. No wonder when we see then an increase up to 60.

Predictions

As stated above, there are many observations possible when looking at Table 1. So, equally many predictions are possible, too. Let me start with two straightforward predictions. For 2008 I expect 60 Ph.D. announcements in general (see above) and 30 SIKS Ph.D. theses.

Broadening the scope even further, I expect for 2009: 80 announcements (including CATCH, Multimedium, NBIC, Vl/e, and BIG GRID related research). For SIKS, I would optimistically like to go to 40 students, since SIKS is growing and the number of Ph.D. students per chair is growing. Last year, I predicted for 2012 the numbers 100 and 50. Having seen the current trend of stabilization and having seen the current activities I keep that prediction for this overview.

Below we honour our 46 successful Ph.D. defenders who completed their theses in 2007. We list them together with the date of promotion. Thereafter we reproduce the SIKS promovendi 2007 list and we complete the contribution by a list of new announcements.

J. van Grinsven (9-1), R. Sietsma (10-1), J. De Boeck (15-1), M. Apistola (18-1), W. Teepe (18-1), P. Mika (5-2), K. Bergstra (7-2), N. Spiro (7-2), K. Leune (28-2), N. Jovanović (14-3), M. Bulacu (15-3), J. van Diggelen (21-3), R. van den Hoogen (28-3), C. Vens (30-3), A. Diplaros (19-4), L. Scholten (20-4), G. Mishne (27-4), B. Schermer (9-5), J. Vennekens (11-5), D. Mobach (21-5), H. Aldewereld (4-6), M. Hoogendoorn (18-6), P. van der Vlist (29-6), N. Stash (2-7), R. Rienks (11-7), M. van Gerven (5-9), B. Orriëns (12-9), Th. Charitos (17-9), N.K. Mulira (17-9), D. Grossi (17-9), J. Lacroix (20-9), S.M. Muniafu (1-10), Z. Zlatev (4-10), S. Jansen (8-10), N. Bergboer (10-10), D. Levy (11-10), P. Barna (30-10), G. Ramírez Camps (2-11), S.-P. van Houten (6-11), R. Chin (12-11), K. Vermaas (26-11), M. Verduijn (28-11), J. Schalken (17-12), L. Bonebakker (17-12), L. Axner (18-12), D.J. Broekens (18-12).

SIKS PROMOVENDI 2007

2007-01

Kees Leune (UvT). *Access Control and Service-Oriented Architectures*. Promotor: Prof.dr.ir. M.P. Papazoglou (UvT). Co-promotor: Dr. W.-J. van den Heuvel (UvT). Promotion: February 28, 2007.

2007-02

Wouter Teepe (RUG). *Reconciling Information Exchange and Confidentiality: A Formal Approach*. Promotor: Prof.dr. L.R.B. Schomaker (RUG). Co-promotor: Dr. L.C. Verbrugge (RUG). Promotion: January 18, 2007.

2007-03

Peter Mika (VU). *Social Networks and the Semantic Web*. Promotores: Prof.dr. J.M. Akkermans (VU) and Prof.dr. T. Elfring (VU). Co-promotor: Dr. P. Groenewegen (VU). Promotion: February 5, 2007.

2007-04

Jurriaan van Diggelen (UU). *Achieving Semantic Interoperability in Multi-agent Systems: a dialogue-based approach*. Promotor: Prof.dr. J.-J. Ch. Meyer (UU). Co-promotores: Dr.ir. R.-J. Beun (UU), Dr. F.P.M. Dignum (UU) and Dr. R.M. van Eijk (UU). Promotion: March 21, 2007.

2007-05

Bart Schermer (UL). *Software Agents, Surveillance, and the Right to Privacy: a Legislative Framework for Agent-enabled Surveillance*. Promotor: Prof.dr. H.J. van den Herik (UM / UL). Promotion: May 9, 2007.

2007-06

Gilad Mishne (UvA). *Applied Text Analytics for Blogs*. Promotor: Prof.dr. M. de Rijke (UvA). Promotion: April 27, 2007.

2007-07

Natasa Jovanović (UT). *To Whom It May Concern – Addressee Identification in Face-to-Face Meetings*. Promotor: Prof. dr.ir. A. Nijholt (UT). Co-promotor: Dr.ir. H.J.A. op den Akker (UT). Promotion: March 14, 2007.

2007-08

Mark Hoogendoorn (VU). *Modeling of Change in Multi-Agent Organizations*. Promotores: Prof.dr. J. Treur (VU) and Prof.dr. C.M. Jonker (TUD). Promotion: June 18, 2007.

2007-09

David Mobach (VU). *Agent-Based Mediated Service Negotiation*. Promotor: Prof.dr. F.M.T. Brazier (VU). Co-promotor: Dr. B.J. Overeinder (VU). Promotion: May 21, 2007.

2007-10

Huib Aldewereld (UU). *Autonomy vs. Conformity: an Institutional Perspective on Norms and Protocols*. Promotor: Prof.dr. J.-J. Ch. Meyer (UU). Co-promotor: Dr. F. Dignum (UU). Promotion: June 4, 2007.

2007-11

Natalia Stash (TU/e). *Incorporating Cognitive/Learning Styles in a General-Purpose Adaptive Hypermedia System*. Promotores: Prof.dr. P.M.E. de Bra (TU/e) and Prof.dr. L. Hardman (CWI / TU/e). Co-promotor: Dr. A.I. Cristea (University of Warwick, UK). Promotion: July 2, 2007.

2007-12

Marcel van Gerven (RUN). *Bayesian Networks for Clinical Decision Support: A Rational Approach to Dynamic Decision-Making under Uncertainty*. Promotor: Prof.dr.ir. Th.P. van der Weide (RUN). Co-promotor: Dr. P.J.F. Lucas (RUN). Promotion: September 5, 2007.

2007-13

Rutger Rienks (UT). *Meetings in Smart Environments; Implications of Progressing Technology*. Promotor: Prof.dr.ir. A. Nijholt (UT). Co-promotor: Dr. D. Heylen (UT). Promotion: July 11, 2007.

2007-14

Niek Bergboer (UM). *Context-Based Image Analysis*. Promotores: Prof.dr. H.J. van den Herik (UM) and Prof.dr. E.O. Postma (UM). Promotion: October 10, 2007.

2007-15

Joyca Lacroix (UM). *NIM: a Situated Computational Memory Model*. Promotores: Prof.dr. J.M.J. Murre (UM / UvA), Prof.dr. E.O. Postma (UM) and Prof.dr. H.J. van den Herik (UM). Promotion: September 20, 2007.

2007-16

Davide Grossi (UU). *Designing Invisible Handcuffs. Formal Investigations in Institutions and Organizations for Multi-agent Systems*. Promotor: Prof.dr. J.-J. Ch. Meyer (UU). Co-promotor: Dr. F. Dignum (UU). Promotion: September 17, 2007.

2007-17

Theodore Charitos (UU). *Reasoning with Dynamic Networks in Practice*. Promotor: Prof.dr.ir L.C. van der Gaag (UU). Promotion: September 17, 2007.

2007-18

Bart Orriens (UvT). *On the Development and Management of Adaptive Business Collaborations*. Promotor: Prof.dr.ir. M.P. Papazoglou (UvT). Co-promotor: Dr. J. Yang (UvT). Promotion: September 12, 2007.

2007-19

David Levy (UM). *Intimate Relationships with Artificial Partners*. Promotores: Prof. dr. M.J.H. Meijer (UM) and Prof.dr. H.J. van den Herik (UM). Promotion: October 11, 2007.

2007-20

Slinger Jansen (UU). *Customer Configuration Updating in a Software Supply Network*. Promotores: Prof.dr. S. Brinkkemper (UU), Prof.dr. P. Klint (CWI). Promotion: October 8, 2007.

2007-21

Karianne Vermaas (UU). *Fast Diffusion and Broadening Use: A research on residential adoption and usage of broadband internet in the Netherlands between 2001 and 2005*. Promotor: Prof.dr. S. Brinkkemper (UU). Co-promotor: Dr. L. van de Wijngaert (UU). Promotion: November 26, 2007.

2007-22

Zlatko Zlatev (UT). *Goal-oriented Design of Value and Process Models from Patterns*. Promotor: Prof.dr. R.J. Wieringa (UT). Promotion: October 4, 2007.

2007-23

Peter Barna (TU/e). *Specification of Application Logic in Web Information Systems*. Promotores: Prof.dr. P. de Bra (TU/e) and Prof.dr G.-J. Houben (VUB / TU/e). Promotion: October 30, 2007.

2007-24

Georgina Ramírez Camps (CWI). *Structural Features in XML Retrieval*. Promotor: Prof.dr. M.L. Kersten (CWI / UvA). Co-promotor: Dr. A.P. de Vries (CWI / TUD). Promotion: November 2, 2007.

2007-25

Joost Schalken (VU). *Empirical Investigations in Software Process Improvement*. Promotor: Prof.dr. J.C. van Vliet (VU) and Prof.dr. S. Brinkkemper (UU). Promotion: December 17, 2007.

NEW ANNOUNCEMENTS

The list below contains also an announcement from November 28, since we missed this Ph.D. defence in the October issue. It is well noted that Marion Verduijn received in Namur, Belgium the 2006 SKBS Prize for her work that she now defended successfully. Marion, our congratulations with this result and the best wishes in your further career. The latter wishes also hold for the other candidates in the list.

Marion Verduijn (November 28, 2007). *Prognostic Methods in Cardiac Surgery and Postoperative Intensive Care*. Eindhoven University of Technology. Promotor: Prof.dr.mr.dr. B.A.J.M. de Mol (TU/e). Co-promotores: Dr. N. Peek (TU/e), Dr. E. de Jonge (TU/e).

Joost Schalken (December 17, 2007). *Empirical Investigations in Software Process Improvement.* Vrije Universiteit. Promotores: Prof.dr. J.C. van Vliet (VU), Prof.dr. S. Brinkkemper (UU).

Lodewijk Bonebakker (December 17, 2007). *Finding Representative Workloads for Computer System Design*. Delft University of Technology. Promotores: Prof.dr. H.G. Sol (DUT), Prof.dr.ir. A. Verbraeck (DUT).

Lilit Axner (December 18, 2007). *High Performance Computational Hemodynamics with the Lattice Boltzmann Method*. University of Amsterdam. Promotor: Prof.dr. P.M.A. Sloot (UvA). Co-promotor: Prof.dr. A.G. Hoekstra (UvA).

D.J. Broekens (December 18, 2007). *Affect and Learning: A Computational Analysis*. Leiden University. Promotor: Prof.dr. J.N. Kok (UL).

Yan Wang (January 9, 2008). *A Studio Based Approach for Business Engineering and Mobile Services*. Technische Universiteit Delft. Promotor: Prof.dr. H.G. Sol (TUD).

Alexei Sharpanskykh (January 10, 2008). *On Computer-Aided Methods for Modeling and Analysis of Organizations*. Vrije Universiteit. Promotor: Prof.dr. J. Treur (VU).

Bela Mutschler (January 17, 2008). *Modeling and Simulating Causal Dependencies on Process-aware Information Systems from a Cost Perspective*. University of Twente. Promotor: Prof.dr. R. J. Wieringa (UT). Co-promotor: Dr. M.U. Reichert (UT).

Katalin Boer-Sorbán (January 25, 2008). *Agent-Based Simulation of Financial Markets: A modular, continuous-time approach*. Erasmus Universiteit Rotterdam. Promotor: Prof.dr. A. de Bruin (EUR). Co-promotor: Dr.ir. U. Kaymak (EUR).

Vera Hollink (January 31, 2008). *Optimizing Hierarchical Menus: a usage-based approach*. University of Amsterdam. Promotor: Prof.dr. B.J. Wielinga (UvA). Co-promotor: Dr. M.W. van Someren (UvA).

Ander de Keijzer (February 1, 2008). *Management of Uncertain Data – towards unattended integration*. University of Twente. Promotor: Prof.dr. P.M.G. Apers (UT). Co-promotor: Dr.ir. M. van Keulen (UT).

Stop Press for the NBIC List

Ruben Kok and Jaap van den Herik

At the very last moment we received information from NBIC. The editor (Van den Herik) preferred not to renumerate the Table and the Ph.D. overview. So, he offered NBIC the opportunity to have its full list of Ph.D. students included. We partition them by year.

2008

Blaise Alako (February 1, 2008). *An Integrative Algorithmic Approach Towards Knowledge Discovery in Bioinformatics*. Wageningen UR. Promotor: Prof.dr. J.A.M. Leunissen.

Andre Boorsma (January 18, 2008). *Dissection of Transcriptional Regulation Networks and Prediction of Gene Functions in Saccharomyces Cerevisiae*. University of Amsterdam.

Rob Jelier (January 10, 2008). *Text Mining Applied to Molecular Biology*. Erasmus MC Rotterdam. Promotor: Prof.dr. J. van der Lei. Co-promotores: Dr.ir. J.A. Kors and Dr.ir. G.W. Jenster.

Jifeng Tang (January 8, 2008). *A Bioinformatics Approach to Marker Development*. Wageningen UR. Promotor: Prof.dr. J.A.M. Leunissen. Co-promotor: Dr. B. Vosman.

Michiel Wels (January 7, 2008). *Unraveling the Regulatory Network of Lactobacillus Plantarum WCFS1*. Wageningen UR. Promotor: Prof.dr. W.M. de Vos. Co-promotor: Prof.dr. R.J. Siezen.

2007

Henk-Jan Joosten (December 7, 2007). *3DM: From Data to Medicine*. Wageningen UR. Promotor: Prof.dr. J.A. Berg. Co-promotores: Dr. P.J. Schaap and Dr. J.M. Vervoort.

Radek Szklarczyk (November 23, 2007). *Information Reuse in Comparative Genomics*. VU Amsterdam. Promotor: Prof.dr. J. Heringa. Co-promotor: Dr. A. Nekrutenko.

Anna Karawajczyk (October 31, 2007). *Chemical Activity of Anticancer Compounds*. Leiden University. Promotor: Prof.dr. H. de Groot. Co-promotor: Dr. F. Buda.

Bas Dutilh (October 15, 2007). *Extracting the Evolutionary Signal from Genomes*. CMBI, Radboud University Nijmegen (FMW). Promotor: Prof.dr. M. Huynen. Co-promotor: Dr. B. Snel.

Marcin von Grotthuss (October 5, 2007). *Distant Sequence-structure-Function Relationships in Proteins*. CMBI, Radboud University Nijmegen (FNWI). Promotor: Prof.dr. G. Vriend.

Tim Hulsen (September 14, 2007). *Pharmaco-phylogenomics – Explaining Interspecies Differences in Drug Discovery*. (FNWI) CMBI, Radboud University Nijmegen. Promotor: Prof.dr. J. de Vlieg. Co-promotor: Dr. P.M.A. Groenen.

Jos Boekhorst (May 23, 2007). *Computational Genomics of Gram-positive Bacteria*. CMBI, Radboud University Nijmegen (FNWI). Promotor: Prof.dr. R.J. Siezen. Co-promotor: Prof.dr. M. Kleerebezem.

Vera van Noort (January 8, 2007). *Comparative Genomics of Eukaryotes*. CMBI, Radboud University Nijmegen (FMW). Promotor: Prof.dr. M. Huynen.

2006

Simon Folkertsma (November 3, 2006). *The Nuclear Receptor Ligand-binding Domain: from biological function to drug design*. CMBI, Radboud University Nijmegen (FNWI). Promotor: Prof.dr. J. de Vlieg. Co-promotor: Dr. P.I. van Noort.

Jelle Goeman (March 8, 2006). *Statistical Methods for Microarray Data*. Leiden University. Promotores: Prof.dr. J.C. van Houwelingen and Prof.dr. S.A. van de Geer.

Sander Nabuurs (February 9, 2006). *On the Quality of NMR Structures*. CMBI, Radboud University Nijmegen (FNWI). Promotor: Prof.dr. G. Vriend. Co-promotor: Dr. G.W. Vuister.

2005

Marc van Driel (November 28, 2005). *Bioinformatics Strategies for Disease Gene Identification*. CMBI, Radboud University Nijmegen (FNWI). Promotores: Prof.dr. G. Vriend and Prof.dr. H. Brunner. Co-promotor: Prof.dr. J.A.M. Leunissen.

Toni Gabaldon (October 11, 2005). *Origin and Evolution of the Mitochondrial Proteome*. CMBI, Radboud University Nijmegen (FMW). Promotor: Prof.dr. M. Huynen.

2004

Elmar Krieger (September 27, 2004). *The Last Mile of the Protein Folding Problem: A pilgrim's staff and skid-proof boots*. CMBI, Radboud University Nijmegen (FNWI). Promotor: Prof.dr. G. Vriend.

Section Editor
Richard Starmans

Advanced SIKS Course "Engineering Web-based Systems: a semantic perspective"

In the spring of 2008 the advanced SIKS course "Engineering Web-based systems: a semantic perspective" will be organized in Conference Center Landgoed Huize Bergen in Vught. It will address such issues as the Semantic Web, XML-technology and applications. The exact date will be announced in due course. 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.

SCIENTIFIC DIRECTORS

- Prof. dr. G.-J. Houben (VUB,TU/e)
- Dr. S. Schlobach (VU)

REGISTRATION

For registration you are requested to fill in the electronic form at the SIKS site, where more details on the arrangements are available as well.

Advanced SIKS Course on "Computational Intelligence"

INTRODUCTION

In April 2008, the School for Information and Knowledge Systems (SIKS) will organize an Advanced Course on Computational Intelligence. The dates will be announced in due course. 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)

PRELIMINARY PROGRAM

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

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

REGISTRATION

For registration you are requested to fill in the electronic form at the SIKS site, where more details on the arrangements are available as well.

Agent Summer School for SIKS-Ph.D. Students

From May 5-9, 2008, the tenth edition of the European Agent Systems Summer School (EASSS 2008) takes place in Lissabon, Portugal. Details on the program are not available yet, but the program of last year's edition that took place in Durham, UK may give a first impression of the content: http://www.dur.ac.uk/durham.agents007/EASSS07/

As a result of the cooperation between SIKS and the EASSS 2007 organisation, SIKS-Ph.D. students can participate without paying entrance fee. The summer school is part of the advanced components stage of the school's educational program and therefore Ph.D. students working in the field of agent systems are strongly encouraged to participate.

However, there is a fixed number of places available for SIKS-Ph.D. students at the summer school, and therefore an early registration is required. To apply for this SIKS-arrangement related to EASSS 2008, Ph.D. students should register on the SIKS-site.

Third SIKS/BENAIS Conference on Enterprise Information Systems

For the third time, the Dutch Research School SIKS organizes the Dutch/Belgian Conference on Enterprise Information Systems (EIS). The event will take place on May 22 and 23 in Tilburg. The purpose of EIS is to bring together Dutch/Belgian researchers interested in the advances and business applications of information systems – a broad field, including topics such as Management Information Systems, E-Business, IS Analysis and Design, Requirements Engineering, Business Innovation, Knowledge Management, Business Process Management, Product Software Development, Coordination and Communication, Collaborative Information Systems, Business/IT Alignment, Architectures for IKS and many others.

EIS 2008 is organized by SIKS in cooperation with BENAIS, the local Benelux chapter of AIS and offers a unique opportunity for research groups from both the Computer Science-side and the Management-side to report research, meet and interact. EIS also includes a Doctoral Consortium. For more details, check: http://www.benais.nl/

ORGANISATION

Hans Weigand (UvT, BENAIS), Rien Hamers (Fontys), Richard Starmans (SIKS)

IMPORTANT DATES

March, 1	Submission deadline for category A and C papers
March, 19	Submission deadline for category B papers
April, 11	Notification of acceptance
May, 22-23	EIS 2008, Tilburg, The Netherlands

Participation is free for all SIKS-members (senior research fellows, research fellows, associated members and of course Ph.D. students) and SIKS-alumni.

PROGRAM COMMITTEE

Hans Akkermans (VU), Ronald Batenburg (UU), Egon Berghout (RUG), Harry Bouwman (TUD), Bert de Brock (RUG), Jaap Gordijn (VU), Paul Grefen (TU/e), Jos van Hillegersberg (UT), Stijn Hoppenbrouwer (RUN), Piet Ribbers (UvT), Monique Snoeck (KUL), Yao-Hua Tan (VU), Jan Vanthienen (KUL), Roel Wieringa (UT), Hans Weigand (UvT)

ANNOUNCEMENTS

Call for Papers

Logic and the Simulation of Interaction and Reasoning Symposium at AISB 2008

Aberdeen, Scotland
April 3-4, 2008

For more information, see www.illc.uva.nl/GLoRiClass/index.php?page=8_1 and www.aisb.org.uk/convention/aisb08/index.html.

In the past years, logicians have become more and more interested in the phenomenon of interaction. The area "logic and games" deals with the transition from the static logical paradigm of formal proof and derivation to the dynamic world of intelligent interaction and its logical models. A number of conferences and workshops have been dealing with logic in game and decision theory and dynamic logics with announcement and action operations. Fruitful technical advances have led to deep insights into the nature of communicative interaction and behaviour by logicians.

While these interactive aspects are relatively new to logicians, on a rather different level, modelling intelligent interaction has been an aspect of the practical work of computer-game designers, researchers in artificial intelligence, robotics, and human-machine interaction for a long time. The practical aspects of simulating interaction and behaviour reach out to a wide interdisciplinary field including psychology and cognitive science.

So far, there are only a few cross-links between these two communities. Our symposium will explore the possibilities of joining the theoretical approach to interaction and communication with the practical approach to simulating behaviour. We would like to include purely logical aspects, cognitive and psychological aspects (including empirical testing of formal models), and pragmatic aspects.

All researchers from logic, artificial intelligence, computer science, cognitive science, computer gaming, psychology, empirical game theory, and many other fields are cordially invited to submit abstracts of two to eight pages in PDF format through our EasyChair page www.easychair.org/conferences/?conf=AISB2008-LSIR.

INVITED SPEAKERS

- Rafael Bordini, Durham, England
- Frank Dignum, Utrecht, The Netherlands
- Steffen Huck, London, England (tentative)
- Mateja Jamnik, Cambridge, England
- David Ethan Kennerly, Los Angeles CA, USA
- Eric Pacuit, Stanford CA, USA (tentative)

PROGRAMME COMMITTEE

- Stefania Bandini, Milan, Italy
- Johan van Benthem, Amsterdam, The Netherlands & Stanford CA, USA
- Cristiano Castelfranchi, Rome, Italy
- Bruce Edmonds, Manchester, England
- Jaap van den Herik, Maastricht, The Netherlands
- Wiebe van der Hoek, Liverpool, England
- Benedikt Loewe, Amsterdam, The Netherlands (Chair)
- Yoav Shoham, Stanford CA, USA
- Keith Stenning, Edinburgh, Scotland
- Rineke Verbrugge, Groningen, The Netherlands

SPONSOR

Marie Curie Research Training Site GLoRiClass (MEST-CT-2005-020841).

IMPORTANT DATES

January 9, 2008	Deadline for submissions of papers
February 15, 2008	Notification
March 1, 2008	Deadline for final versions
April 3-4, 2008	Workshop

BEST STUDENT PAPER AWARD

The AISB gives an award of £ 250 for the best student paper. More details can be found on the webpage of the convention.

PUBLICATION

All papers presented at this workshop will be published in the proceedings of the AISB Convention.

Call for Papers

8th Dutch-Belgian Information Retrieval Workshop (DIR 2008)

University of Maastricht, the Netherlands
April 14-15, 2008

The primary aim of the DIR 2008 Workshop is to provide an international meeting place where researchers from the domain of information retrieval and related disciplines can exchange and present innovative research developments.

We are happy to announce that Hinrich Schuetze, University of Stuttgart, will give an invited talk at DIR 2008. His new book *Introduction to Information Retrieval* will appear in 2008 (Cambridge UP).

Conference themes include, but are not limited to the following topics:

- Multimedia IR, video retrieval, audio and music retrieval, cross-media retrieval
- Multilingual and cross-lingual retrieval
- Structured document retrieval, XML-IR
- Retrieval models, language models
- Image processing for IR, audio processing for IR
- Natural-language processing for IR, information extraction, text summarization

- Processing and search of e-mail, spam, blogs
- Categorization, topic tracking and event detection
- Query processing, thesaurus construction, user models
- Web IR, distributed IR, enterprise search, search of digital libraries, intranets or desktops
- Collaborative filtering, recommendation systems
- Efficiency and performance
- IR evaluation

Papers may range from theoretical work to system descriptions. We encourage Ph.D. students to submit their research. We also welcome contributions from the industry when they focus on novel research directions. Submissions will be reviewed by at least three domain experts. Following the tradition of DIR, highly ranked papers will be considered for publication in an international journal or book. The conference language is English.

IMPORTANT DATES

Deadline for papers:	February 2, 2008
Notification of acceptance:	February 26, 2008
Deadline for final versions:	March 12, 2008
Workshop:	April 14-15, 2008

SUBMISSION DETAILS

Papers describe original research, have a length of maximum 8 pages, and are formatted in ACM SIG Proceedings style (http://www.acm.org/sigs/pubs/proceed/template.html). They are submitted in pdf-format to dir2008@UGent.be

PROGRAM CHAIRS

- Eduard Hoenkamp, University of Maastricht
- Martine De Cock, Ghent University Association
- Veronique Hoste, Ghent University Association

PROGRAM COMMITTEE

- Gosse Bouma, Rijksuniversiteit Groningen
- Walter Daelemans, Universiteit Antwerpen
- Maarten de Rijke, University of Amsterdam
- Guy De Tre, Ghent University
- Anne Diekema, Syracuse University
- Theo Gevers, University of Amsterdam
- Djoerd Hiemstra, University of Twente
- Theo Huibers, University of Twente
- Wessel Kraaij, TNO Delft
- Marie-Francine Moens, Katholieke Universiteit Leuven
- Stephan Raaijmakers, TNO Delft
- Hichem Sahli, Vrije Universiteit Brussel
- Dawei Song, The Open University, Milton Keynes, UK
- Tinne Tuytelaars, Katholieke Universiteit Leuven
- Antal van den Bosch, Tilburg University
- Theo van der Weide, Radboud Universiteit Nijmegen
- Roelof van Zwol, Yahoo!, Barcelona
- Werner Verhelst, Vrije Universiteit Brussel
- Jun Wang, University College London, UK
- Thijs Westerveld, Centrum voor Wiskunde en Informatica (CWI), Amsterdam

DIR 2008 is co-organized by the University of Maastricht and Ghent University Association under the auspices of the Dutch Working Community on Information Sciences (WGI).

For more information, see http://www.ltci.ugent.be/DIR2008/.

Call for Papers

ALAMAS+ALAg 2008
Learning Agents Workshop at AAMAS 2008

http://ki.informatik.uni-wuerzburg.de/~kluegl/ALAMAS.ALAg/

- Submission Deadline: January 25, 2008
- Notification of acceptance: February 25, 2008
- Camera-ready copies: March 8, 2008

Adaptive and Learning Agents, particularly those in a multi-agent setting are becoming more and more prominent as the sheer size and complexity of many real-world systems grows. How to adaptively control, coordinate and optimize such systems is an emerging multi-disciplinary research area at the intersection of Computer Science, Control Theory, Economics, and Biology.

The goal of this workshop is to increase awareness and interest in adaptive-agent research, encourage collaboration and give a representative overview of current research in the area of adaptive and learning agents. It aims at bringing together not only scientists from different areas of computer science but also from different fields studying similar concepts (e.g., game theory, bio-inspired control, mechanism design).

This workshop will focus on all aspects of adaptive and learning agents and multi-agent systems with a particular emphasis on how to modify established learning techniques and/or create new learning paradigms to address the many challenges presented

by complex real-world problems. The topics of interest include but are not limited to:

- Novel combinations of reinforcement and supervised learning approaches
- Integrated learning approaches that work with other agent reasoning modules like negotiation, trust models, coordination, etc.
- Supervised multi-agent learning
- Reinforcement learning in multi-agent systems
- Distributed Learning
- Adaptation and learning in dynamic environments
- Evolution of agents in complex environments
- Co-evolution of agents in a multi-agent setting
- Cooperative exploration and learning to cooperate and collaborate
- Learning trust and reputation
- Communication restrictions and their impact on multi-agent coordination
- Design of reward structure and fitness measures for coordination
- Scaling learning techniques to large systems of learning and adaptive agents
- Emergent behavior in adaptive multi-agent systems
- Game-theoretical analysis of adaptive multi-agent systems
- Neuro control in multi-agent systems
- Bio-inspired multi-agent systems
- Applications of adaptive and learning agents and multi-agent systems to real-world complex systems
- Learning of Co-ordination

We plan to organize a special issue containing the best papers of the workshop.

SUBMISSION DETAILS

Paper submissions are in the form of extended abstracts of up to 8 pages in length. Please submit papers by email in pdf format to alamas.alag@ki.informatik.uni-wuerzburg.de with in the subject line: "Submission ALAMAS+ALAg". Papers should be submitted in ACM proceedings format.

ORGANIZATION

Franziska Klügl (U Würzburg)
Sandip Sen (U Tulsa)
Karl Tuyls (U Maastricht)

If you have any questions about the ALAMAS+ALAg workshop, please contact the chairs by email: alamas.alag@ki.informatik.uni-wuerzburg.de.

Call for Papers

6th International Conference on Ant Colony Optimization and Swarm Intelligence (ANTS 2008)

Brussels, Belgium
September 22-24, 2008

SCOPE OF THE CONFERENCE

Swarm intelligence is a relatively new discipline that deals with the study of self-organizing processes both in nature and in artificial systems. Researchers in ethology and animal behavior have proposed many models to explain interesting aspects of social insect behavior such as self-organization and shape-formation. Recently, algorithms inspired by these models have been proposed to solve difficult computational problems.

An example of a particularly successful research direction in swarm intelligence is ant-colony optimization, the main focus of which is on discrete optimization problems. Ant-colony optimization has been applied successfully to a large number of difficult discrete optimization problems including the travelling-salesman problem, the quadratic-assignment problem, scheduling, vehicle routing, etc., as well as to routing in telecommunication networks. Another interesting approach is that of particle-swarm optimization, that focuses on continuous optimization problems. Here too, a number of successful applications can be found in the recent literature. Swarm robotics is another relevant field. Here, the focus is on applying swarm-intelligence techniques to the control of large groups of cooperating autonomous robots.

ANTS 2008 will give researchers in swarm intelligence the opportunity to meet, to present their latest research, and to discuss current developments and applications. The three-day conference will be held in Brussels, Belgium, on September 22-24, 2008. Tutorial sessions will be held in the mornings before the conference program.

RELEVANT RESEARCH AREAS

ANTS 2008 solicits contributions dealing with any aspect of swarm intelligence. Typical, but not exclusive, topics of interest are:

- Behavioral models of social insects or other animal societies that can stimulate new algorithmic approaches.
- Empirical and theoretical research in swarm intelligence.
- Application of swarm-intelligence methods, such as ant-colony optimization or particle-swarm optimization, to real-world problems.

- Theoretical and experimental research in swarm robotics systems.

PUBLICATION DETAILS

Conference proceedings will be published by Springer in the LNCS series. The journal Swarm Intelligence will publish a special issue dedicated to ANTS 2008 that will contain extended versions of the best research works presented at the conference.

BEST PAPER AWARD

A best paper award will be presented at the conference.

FURTHER INFORMATION

Up-to-date information will be published on the web site http://iridia.ulb.ac.be/ants2008/. For information about local arrangements, registration forms, etc., please refer to the above-mentioned web site or contact the local organizers at the address below.

CONFERENCE ADDRESS

ANTS 2008, IRIDIA, CP 194/6, Tel +32-2-6502729, Université Libre de Bruxelles Fax +32-2-6502715, Av. F. D. Roosevelt 50, http://iridia.ulb.ac.be/ants2008, 1050 Bruxelles, Belgium, email: ants@iridia.ulb.ac.be.

CONFERENCE LOCATION

Salle Dupréel, Building S, Campus du Solbosch, Université Libre de Bruxelles, Av. Jeanne 44, 1050 Brussels, Belgium.

IMPORTANT DATES

Submission deadline	March 16, 2008
Notification of acceptance	May 16, 2008
Camera-ready copy	May 30, 2008
Conference	September 22-24, 2008

ANTS 2008 CONFERENCE COMMITTEE

- General Chair: Marco Dorigo, Université Libre de Bruxelles, Brussels, Belgium
- Technical Program Chairs: Christian Blum, Universitat Politècnica de Catalunya, Barcelona, Spain; Maurice Clerc, University of Essex, Colchester, UK; Alan Winfield, University of West of England, Bristol, UK
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SPONSORS

- AntOptima: http://www.antoptima.com
- Comp2Sys, Marie Curie Early Stage Training Site: http://iridia.ulb.ac.be/comp2sys
- French Community of Belgium (through the research project ANTS): http://www.cfwb.be
- IEEE Computational Intelligence Society (as a technical co-sponsor): http://www.ieee-cis.org

Call for Nominations

2007 Artificial Intelligence Dissertation Award

Nominations are invited for the **2007 Artificial Intelligence Dissertation Award** sponsored by ECCAI, the European Coordinating Committee for Artificial Intelligence.

This Award includes a certificate signed by the ECCAI Chair and 1.500 Euros (which includes the travel grant for the Award ceremony).

Eligible doctoral dissertations are those defended after **December 1, 2006** in the general area of Artificial Intelligence. The dissertation must have been defended at an European university and the author must be a personal member of an ECCAI member society. Multiple submissions of the same doctoral dissertation to other dissertation award activities of other societies are excluded.

The selection of the most meritorious research Ph.D. thesis is based on the originality, impact, and written quality of the work. Work that has been submitted to and/or accepted at workshops, conferences, or journals will be considered more favourably. Work that is primarily attributed to the student's own initiative will be considered more favourably.

Finally, the quality of the written document in terms of its organization, polish, and use of language will be considered.

Submissions will be judged by the Peer Reviewing Procedure, coordinated by a representative of the ECCAI Board, on the basis of the following criteria:

- Relevance to Artificial Intelligence;
- Breakthrough idea;
- Meticulous, well-written work;
- Entrepreneurial student;
- Relevance and transferability to other countries;
- Scientific soundness;
- Innovation (new knowledge).

The deadline for receipt of submissions is **January 31, 2008**.

The Award will be presented during ECAI 2008 in Patras, Greece (July 21-25th, 2008).

For more details, see http://www.eccai.org/diss-award/current.shtml.

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COPY

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