

Rich Cognitive Models
for Policy Making
and Simulation

NSVKI Goes AWAI

BNAIC 2008:
A photo impression

AI Is Fun

Editor-in-chief

A promise is a promise. In the previous issue there was a lot of attention for the BNAIC 2008 event, with several general reports and many session reports. However, due to space limitations I only was able to include a single photograph. I promised you more photographs in the next issue. So here they are. No less than fourteen photographs are included, filling a double page, and providing a nice photo impression of two most enjoyable days. Yes, indeed, AI conferences provide often also a lot of fun.

Though BNAIC 2008 is just behind us, preparations for BNAIC 2009 are already in full swing. The program committee chairs, Toon Calders and Karl Tuyls of Eindhoven University of Technology, are working hard to make the 21st edition of the BNAIC as good and enjoyable as the previous edition. Make sure that you make the deadline of June 12 to submit a paper.



And yes, AI research can really be enjoyable, especially if you are able to incorporate your ideas and developments into funny applications. Surfing on the internet I came across a website of a company, called Oddcast. Oddcast is a provider of speaking avatar-based products designed for viral marketing, user generated content, website conversion, e-learning, social networks and mobile. The management team of Oddcast consists of only two people, Adi and Gil Sideman. Both have a profound academic background and experience in computer science. Adi was the producer of many online games and animated characters. Gil has a long experience in developing client-server internet imaging products for the graphic arts and medical imaging markets. Although their prime interest is to develop and, of course, sell campaigns, they have built many applications to show their skills. And many of these demonstrations are really nice. I can imagine Adi and Sid having a lot of fun while building their demonstrations. To name just a few, on their website they have a demonstration for text-to-speech translation. Type your text and choose your language, intonation or even a dialect. Amazingly good. By the way, notice how

the characters follow your cursor movement with their face and eyes. Alternatively, you can also let your text be sung on an existing melody. Clearly this technology is not so well developed, but fun it is. And of course, funny also are the demo's where you can morph your face with existing faces or objects.

Another example of funny AI-related stuff on the internet? On a website, dedicated to math, I encountered the sentence: "Bored? Talk to Splotchy, an artificial intelligence robot with funny voice." A kind of Eliza-like chat bot, in this respect not new, but Splotchy has a conversation that surely is less boring.

Finally, I stumbled on a website by Leon Peshkin, with a list of links to amazing AI demos on the internet. While unfortunately some of the links don't work anymore (one of the big problems with internet in my opinion), several of the links that do work reveal a lot of interesting AI-related information.



Oddcast

Oddcast's text-to-speech demo:

Splotchy the talking AI robot:

AmazIng AI:

<http://www.oddcast.com/>

<http://www.oddcast.com/home/demos/tts/frameset.php?frame1=talk>

<http://www.algebra.com/cgi-bin/chat.mpl>

<http://people.csail.mit.edu/pesha/AmazIng.htm>

TABLE OF CONTENTS

AI Is Fun	2
Table of Contents	3
BNVKI-Board News (Antal van den Bosch)	4
Rich Cognitive Models for Policy Making and Simulation (Virginia Dignum)	4
NSVKI Goes AWAI (Nico Vlaming)	5
BNAIC 2008: A photo impression	6
Ph.D. Thesis Abstracts	8
A New Approach to Distributed Data Fusion (Huub de Waard)	8
Discovery Services in Information Rich Environments (Nong Chen)	8
Reinforcement Learning in Continuous State Action Spaces (Lucian Buşoniu).....	9
A Framework for Evidence-based Policy Making using IT: A systems approach (Hans Stol)	10
Structured Prediction for Natural Language Processing: A constraint satisfaction approach (Sander Canisius).....	12
Better than a Substantial Increase (Jaap van den Herik)	14
SIKS (Richard Starmans)	15
Symposium “Innovating IT” – Surfing the fourth wave	15
Advanced SIKS Course “Probabilistic Methods for Entity Resolution and Entity Ranking”	16
Basic SIKS Courses “Learning and Reasoning” and “Information Retrieval”	16
CAiSE-DC2009 for SIKS-Ph.D. Students	17
Summer School on “Services and Software Architectures, Infrastructures and Engineering”	17
Announcements	17
Call for Papers: 18 th Annual Belgian-Dutch Conference on Machine Learning (Benelearn 09, Tilburg, May 18-19, 2009)	17
Call for Papers: 2 nd International Conference on Human-Robot Personal Relationships (Tilburg, June 11-12, 2009)	19
Call for Papers: MLDM 2009 (6 th International Conference on Machine Learning and Data Mining (Leipzig, Germany, July 23-25, 2009)	20
Call for Papers (research track): Benelux Conference on Artificial Intelligence (BNAIC, Eindhoven, October 29-30, 2009)	21
Conferences, Symposia, Workshops	23
Advertisements in the BNVKI Newsletter	23
Contact Addresses Board Members / Editors BNVKI Newsletter / How to Subscribe? / Submissions	24

The photographs on p. 4 and p. 5, left, are by courtesy of the Lorentz Center, the one on p. 5, right, by Nico Vlaming, and those on the front cover and on pp. 6-7 by Alice Vissers.

Front cover: Dancing-robot demonstration at BNAIC 2008.

The deadline for the next issue is: **April 15, 2009.**

BNVKI-Board News

Antal van den Bosch

As hopes of spring are faintly in the air, the board is happy to report that preparations for the next BNAIC, the twenty-first, are well underway. Karl Tuyls and Toon Calders are paving the way for the next installment of our yearly meeting, at Eindhoven Technical University, on October 29-30, 2009.

In the mean time, we are also pleased to see our new Benelux AI Event Series shape up. As explained in the last general assembly, we would like everyone in the Low Countries to consider hooking up locally organized events to our event series; we can offer some sponsoring of your event and can send out your announcements via our email list. To start, we ask you to provide us with a sponsoring request, a description of the meeting (what is it about, who is likely going to come), and a prospective budget. Subsequently, we invite you to write about the event, to be published in the next issue of this newsletter.

While we know that some of us prefer to “live close to the deadline”, we already wish you inspiration and good results for your upcoming BNAIC submissions. Do not forget to encourage your talented (Research) Master’s students to consider submitting.

Rich Cognitive Models for Policy Making and Simulation

*Virginia Dignum
Utrecht University*

January 12-16, 2009

Organisers: V. Dignum, C. Jonker, W. Jager

The aim of the workshop was to derive a perspective on how much cognition is required in social simulation models to make them useful in practical policy issues, such as the conflicts in Afghanistan and Georgia, the contrasting views on energy issues and the diffusion of the iPhone, to name just three very different examples.

The invited speakers presented contrasting views on this matter. B. Silverman presented a simulation framework which was very rich and incorporated many cognitive concepts such as culture. N. Gilbert took the opposite view, and took the stand that cognition is usually not necessary to model higher order phenomena. Here two different approaches

were contrasted, one which reflected a more engineering view, aimed at building complex models, and one focussing primarily on an Occam’s razor approach, trying to explain social phenomena from simple models. This fuelled discussions during the rest of the week on the trade off between the complicatedness of models versus the transparency of outcomes, a critical issue for understanding and modelling complex systems. Another approach was illustrated by J.M. Bradshaw, who focussed on man-machine interactions. This presentation raised the issue on the level of agent cognition needed for the interaction with people.



Prof. Nigel Gilbert defending his view.

During the workshop a total of 19 attendants gave short presentations on their own work, which further fuelled vivid discussions, as the common interests in cognitive rich agents in social settings were addressed in many different ways. Hence these presentations were both informative for the audience, being confronted with different approaches, as well as for the presenters, getting feedback from different perspectives.

An important part of the workshop was devoted to work in subgroups. During the first day, attendants joined different topical groups on the basis of their research interest, such as environmental policy, migration in Europe, transportation and transitions in energy. Here discussions emerged on what tools and methodologies could and should be used in developing simulation models that would provide a perspective on policy making in complex environments. During the second day groups were formed along theoretical methodological interests. Here the groups focussed on questions relating to norms, second-order cognition (the representation I

have of what another thinks of me) and social networks.

Over the week discussions were aimed at developing ideas for joint research projects. Several ideas for proposals (often aimed at the EU FP7 program) emerged, and discussions are continuing after the workshop, indicating that a number of working groups will actually submit proposals. Also it was decided to organise a special session during the upcoming ESSA conference on rich cognitive models.

Finally, we observed that the discussions during the day and the evening were very vivid, indicating that the workshop contributed to strengthening the links between researchers from different disciplines. The many positive comments we received after this workshop confirmed our belief that this workshop reached its aims.



One of the many vivid discussions.

NSVKI Goes AWAI

Nico Vlaming

Board of USCKI Incognito 08/09

Since September last year, Incognito, Cover and CognAC, student associations for AI in Utrecht, Groningen and Nijmegen, together with the NSVKI, joined hands to organise something interesting, something fun and something across the boarder for their members. Rumors became memes, memes became reality and there it was: AWAI 08/09.

Last February thirty students of the aforementioned city's gathered in Enschede to make the (not so far) journey to Osnabrueck, Germany. For three days they would explore the city and visit the University of Osnabrueck. Thursday, on arrival we played get-to-know-each other games, had dinner and participated in a most entertaining "night-watch" tour through the medieval part of the city. While holding lanterns we were lead through snow and

wind by a fully dressed night-watcher for two hours and learned a lot about medieval buildings. On Friday we visited the cognitive science department of the university. In the morning six speakers told us about the research projects in their research groups; Neuroinformatics (the group of Prof.dr. Riedmiller), Artificial Intelligence (Prof.dr. Kai-Uwe Kühnberger), Cognitive Psychology (Prof.dr. Franz Schmalhofer), Knowledge Based Systems (of Prof. Dr. Herzberg), Neurocybernetics (Prof.dr. Pasemann) and Computational Linguistics (Prof.dr. Stephan Evert). Machine learning in the physical world, a refreshing look at computational linguistics (languages are not stand-alone systems in the brain), new eye-tracking technology, using lasers for vision (on robots) and self-learning limbs (also on robots) are a few of the interesting topics discussed in the presentations.

After the lunch there was a poster session to get a more detailed look at the research projects and to conclude our visit we had an extensive demonstration of the Brainstormers Tribots. Brainstormers is a team of robots playing soccer in the RoboCup. In a room with a soccer field for a floor the goaly and an attacker showed us their skills (still assisted by humans though). Judging from the numerous questions and endless talks afterwards this was probably one of the highlights of our visit. Friday night was time off for everyone which meant having dinner, drinks and playing games at our hostel for most of us. Saturday would be the day of our return to Holland but not before we experienced an annual "Volksfest" called "Ossensamstag" which is the Osnabrueck-name for carnival.

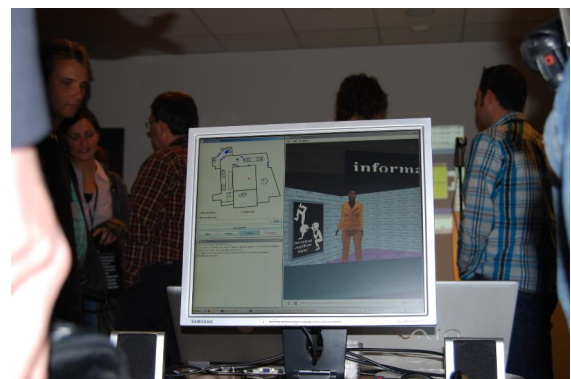
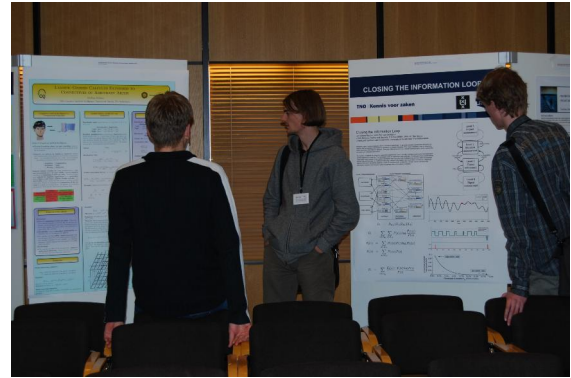


Demonstration at the soccer field.

To conclude this report I think AWAI 08/09 (AWAI is short for Away With AI, of course) was a big success; we learned a lot about Osnabrueck and its cognitive science department, we got to know new students from other cities including Osnabrueck and it was a great networking opportunity as well.

BNAIC 2008: A photo impression

*Alice Vissers
Twente University*



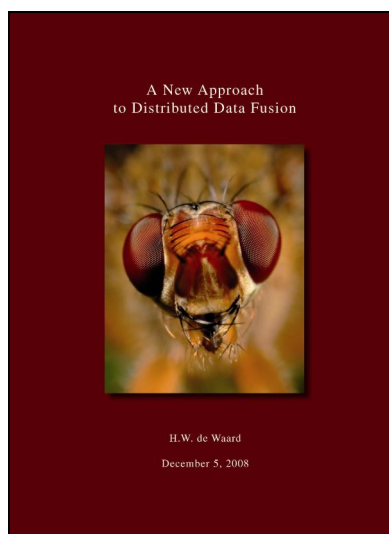


PH.D. THESIS ABSTRACTS

A New Approach to Distributed Data Fusion

Ph.D. thesis abstract
Huib de Waard

Promotores: Prof.drs. M. Boasson and Prof.dr.ir.
F.C.A. Groen
Date of defense: December 5, 2008



The data fusion process considered in this thesis is applied in a defence context. The main military applications use sensors and other sources of data (e.g. GIS-database) to compile pictures of battle situations to support military C^2 . The battle situations of interest can occur on land, on sea, in the air or in combinations thereof. The objective of this study was to develop a new data fusion architecture which is flexible enough to instantiate central, distributed or hybrid data fusion systems. Special attention was given to developing new algorithms to reduce computation time and communication load.

To reduce the probability of processing delays, algorithms have been developed that reduce the load on the platform computational resources. In cases that this approach is not sufficient to guarantee timely availability of the compiled battlefield picture, a parallel processing model has been developed which distributes the necessary

calculations over a network of available computing resources.

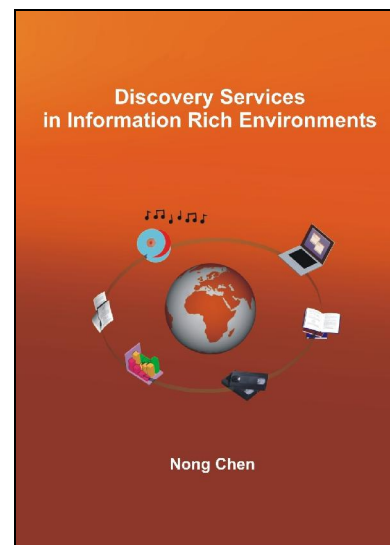
The information in the battlefield picture can be used to engage detected hostile targets. Tactical ballistic missiles (TBM), which can be used to deliver weapons of mass destruction to European countries, represent a new threat. Due to the large ranges at which TBM's will be detected, the results produced by the available tracking algorithms in data fusion applications are very sensitive to sensor error biases. This will prevent the required position and velocity accuracies to be achieved. To improve TBM tracking, a new method based on the use of range and Doppler information has been developed which is not sensitive to sensor error biases.

Based on the new architecture, a demonstrator has been developed. Two trials have been carried out, in which real data was collected. The first trial has validated the claim that it is possible to maintain an accurate track using artificial measurements. The second trial showed that multisensor data fusion is operationally very useful to increase the tracking performance.

Discovery Services in Information Rich Environments

Ph.D. thesis abstract
Nong Chen

Promotores: Prof.dr. H.G. Sol and Prof.dr. A.N.W.
Dahanayaka
Date of defense: December 22, 2008



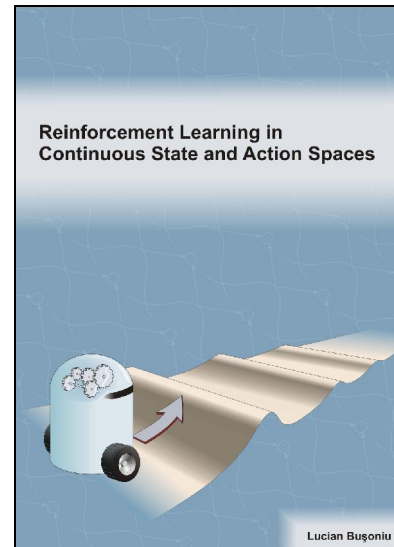
Technology availability has significantly encouraged information sharing in organizational coordination processes distributed over various (geographically) locations, both in business settings, scientific settings and other settings. However, the huge amount of available information, the heterogeneous nature of the information resources, and the information seekers' dynamically changing information needs make it increasingly difficult for organizations and information seekers to find the right information in the right format and at the right time. This is due to two limitations of the current way of designing information systems. A first limitation is presented in the lack of a well-defined conceptual foundation that is acceptable of being used elegantly to model and describe personalized information needs. A second limitation is found in the legacy of monolithic system structures that we have inherited.

The objective of our research was to formulate a new design theory aimed at improving current ways of designing personalized multidisciplinary information seeking and retrieval systems (PMISRS). Taking advantage of valuable theoretical models and frameworks defined and developed in the fields of information retrieval, information seeking, context-aware computing, situation awareness and service-oriented approaches, we explored a set of concepts and relationships required for modeling and designing PMISRS. These concepts and relationships are independent of any domain semantics. They can be used to represent the characteristics of a wide range of information-intensive domains at a high level of abstraction. We tested and evaluated the applicability and the novelty of our design theory by applying it in a case study in which we built a prototype of a PMISRS in a typical multidisciplinary information-intensive domain, crisis response in a port. Based on the test and expert evaluation, we conclude that our design theory is applicable, and the concepts and relationships defined are necessary, valid and valuable.

Reinforcement Learning in Continuous State and Action Spaces

Ph.D. thesis abstract
Lucian Buşoniu

Promotores: Prof.dr. R. Babuška and Prof.dr.ir. B. De Schutter
Date of defense: January 13, 2009



Reinforcement learning (RL) and dynamic programming (DP) algorithms can be used to solve problems in a variety of fields, among which automatic control, artificial intelligence, operations research, and economy. These algorithms find an optimal policy, which maximizes a numerical reward signal measuring the performance. DP algorithms require a model of the problem's dynamics, whereas RL algorithms work without a model. Online RL algorithms do not even require data in advance; they learn from experience. However, DP and RL can find exact solutions only when the states and the control actions take values in a small discrete set. In large discrete spaces and in continuous spaces, approximate solutions have to be used. This is the case, e.g., in automatic control, where the states and actions are usually continuous.

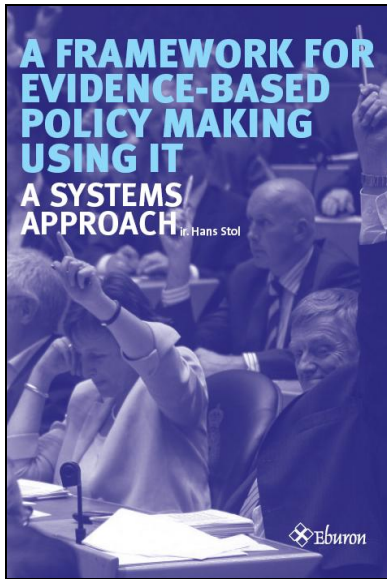
This thesis proposes several novel algorithms for approximate RL and DP, which work in problems with continuous variables: fuzzy Q-iteration, online least-squares policy iteration, and cross-entropy policy search. Fuzzy Q-iteration is a DP algorithm that represents the value function (cumulative rewards) using a fuzzy partition of the state space and a discretization of the action space. The value function is used to compute a near-optimal policy. Fuzzy Q-iteration is provably convergent and consistent. Online least-squares policy iteration is a RL algorithm that efficiently learns from experience an approximate value function and a corresponding policy. It updates the value function parameters by solving linear systems of equations. Cross-entropy policy search represents policies using a highly flexible parameterization, and optimizes the parameters with the cross-entropy method. A representative selection of control problems is used to assess the performance of the proposed algorithms. Additionally, the thesis provides an extensive review of the state-of-the-art in

approximate DP and RL, and discusses some fundamental open issues in the field.

A Framework for Evidence-based Policy Making using IT: A systems approach

Ph.D. thesis abstract
Hans Stol

Promotor: Prof.dr. H.J. van den Herik
Date of defense: January 21, 2009



The thesis concerns policy making, achieving policy decisions, and evaluating the implementation of the policy based on facts. One of the principles is that facts are determined by and dependent of the objectives of people when they observe reality. The emphasis of the thesis is on public policy making. It happens frequently that decisions are made on feelings rather than on facts. It is even worse. For instance measuring the results of the policy implementation is omitted or the measuring is transferred into a discussion where the politician (1) disputes the original objectives, (2) introduces unforeseen circumstances, or (3) argues on changing judgements. In the thesis a framework is proposed for evidence-based policy making (EBPM). Implementing this framework using adequate IT means improves the transparency of the policy decision making, its continuation and its evaluation.

The thesis starts with the following PS.

PS: Is it possible to improve the transparency and measurability of the policy-making process by a framework for evidence-based policy making?

Following the PS four research questions (RQs) are formulated.

RQ1: How can we improve the quality of the policy-making process in terms of transparency and measurability by rationalisation of the process?

RQ2: What are the characteristics of the data, representing the “facts” that should be used to support the achievement of the policy objectives?

RQ3: How can IT contribute in all parts of the EBPM process?

RQ4: What are the characteristics of an information system that will collect the data representing the outcome of the EBPM?

Chapters 2 and 3 lay the foundations for the two research lines of the study: (1) the EBPM process and (2) the integration of IT in this process. Chapter 2 describes the policy making process (PMP). PMP is described as a structured process, using the Systems Approach. We did not confine ourselves to the policy decision making process. The whole process from the start of the desire to change parts of the real world up and until the implementation has been taken into account. The measurability of the intended changes plays an important role, as well as the control of the process of the implementation of the changes. Chapter 3 elaborates on models for (1) the design of information systems and (2) the architecture of information systems. Since the policy-making process may be considered as an information system, these models are also applicable on the analysis of the political process. The chapter ends with the conclusions that the following models and methods are relevant for the design of an architecture of information systems: models of the real world that are represented in the information system, being (1a) activity model, (1b) control model, and (1c) object model; and methods for structuring organisations.

Chapter 4 describes four cases. Each of the cases covers one of the following areas: (1) IT integration in process, (2) data capture as a part of the IT integration, (3) policy decision making, and (4) the EBPM process itself. The case of the administrative information systems architecture of the Delft University of Technology shows (a) how the models for the design of the information architecture have been used to create a new organisation of the administrative data processing, and (b) how the organisation of the information systems is closely connected to the organisation structure. The case of reducing the administrative burdens for enterprises by using electronic data capture methods, is derived from four EU research projects on this subject. The administrative burden on the enterprises is a mayor threshold for capturing reliable data on economic activities. Different kind of solutions for lowering the administrative burden are considered. The

effectiveness of the measures depends on the culture and specific situation in the countries. The case of policy decision making is twofold. First, the change of the control in the governance of the municipalities in the Netherlands is analysed. One of the conclusions is that the new dualistic model provides a clear model for transparent and verifiable policy making. Second, an example of policy making in traffic control in Delft is presented and analysed. In the analysis the models for structuring the PMP are applied. The analysis arrived at the conclusion that the original objectives are not achieved. The case of applying EBPM is derived from experiences in a project, aiming at monitoring and evaluating the policy of the Moroccan Government to simulate ICT. The methods for the organisation of the architecture of information systems and the models for structuring the PMP are used in this case.

Chapter 5 focusses on RQ1: *How can we improve the quality of the policy-making process in terms of transparency and measurability by rationalisation of the process?* We propose a framework to achieve the improvement of the quality of the PMP, called the EBPM framework. We claim that applying the EBPM framework succeeds in achieving the improvement of the quality of EBPM, under the following conditions. The policy decision process is directed to changing (parts) of the real world. The output of the policy decision process includes objectives in terms of the situation to be achieved in the real world, regarding the content (objects and their relations) and timing. The methods for measuring the results are included in the output of the policy decision process. A clear distinction is made between the ultimate goal to be achieved and the control that is required for the achievement. After the limitations of the applicability of the framework were discussed, we arrived at the conclusion that the limitations are primarily determined by the scope of the PMP and the subjects.

Chapter 6 answers RQ2: *What are the characteristics of the data, representing the “facts” that should be used to support the achievement of the policy objectives?* The answer is given in three steps. The first step showed the Metadata Matrix, presenting the frame of reference for the consideration of the metadata that are of interest for the EBPM process. The second step showed the transformation from objectives to representations of the outcomes. In the third step the metadata models are presented. They may be used for (1) representing the objectives, (2) representing the outcomes of the Change Process, and (3) representing the progress of the Change Process.

Chapter 7 addresses RQ3: *How can IT contribute in all parts of the EBPM process?* The added value of the use of IT in each part of the EBPM process is analysed. The answer on RQ 3 is as follows. IT may offer a mayor contribution in the EBPM process in (1) the evaluation of the outcomes of the PMP, (2) modelling the desired situation in the real world, (3) the registration of the objectives, (4) the measurement of the outcomes, (5) the verification of the objectives, and (6) providing transparency. An important basic rule for the judgement of the added value of IT in EBPM is that it supports the participants in the process. A fully integrated formalised IT system for EBPM is not (yet) foreseen.

Chapter 8 discusses RQ4: *What are the characteristics of an information system that will collect the data representing the outcome of the EBPM?* The answer on this RQ is given by specifying the part of the EBPM process that measures the outcomes and creates the indicators for evaluation and justification. The heart of this information system for electronic data capture is the database. The metadata model from Chapter 6 is considered as the basic structure of the database. The different parts of the information system are specified with the help of the models for the design of the information-system architecture, as presented in Chapter 3. The specifications are also compared with the outcomes of four EU research projects on the use of IT tools in data capture.

In Chapter 9 the answers on the four RQs are used to answer the PS: *Is it possible to improve the transparency and measurability of the policy-making process by a framework for evidence-based policy making?* The following answer is given on the PS. By combining methods and models for the design of an architecture of information systems with models for EBPM it is possible to formulate a framework for the policy-making process that fulfils the requirements of (1) being transparent and verifiable, and (2) providing measurable results. The framework consists of different coherent parts, that together controls the implementation of policy decisions based on evidence. The framework cannot be used mechanically, without understanding the underlying reality. The main boundary condition for a successful application of the framework is the express wish of the policy makers to formulate and evaluate their policy in terms of representations of the real world. Even a long elapsed time between the moment of decision making and the implementation of the policy decision is not a reason to deny the efficacy of the framework.

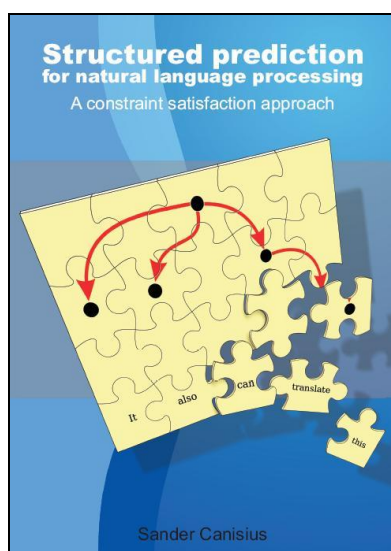
Chapter 9 concludes with some recommendations for (1) information architects concerning the use of

models, (2) politicians and governmental staff on their roles in the process, and (3) members of Parliament and/or Council on the use of the EBPM framework. Furthermore, two future research lines are proposed. (1) Investigation of the relation between our democratic establishment and the possibilities to achieve transparency and verifiability in the policy making process. (2) Elaboration of an EU wide architecture for capturing data on economical activities from enterprises using IT means with the lowest possible administrative burden.

Structured Prediction for Natural Language Processing: A constraint satisfaction approach

Ph.D. thesis abstract
Sander Canisius

Promotor: Prof.dr. A. van den Bosch
Date of defense: February 13, 2009



Many natural language processing tasks are concerned with the mapping between input and output values that have complex structures. For example, in syntactic parsing, a sentence is mapped to a parse tree; in letter-phoneme conversion, a word is mapped to its phonemic transcription; and in machine translation, a sentence in one language is mapped to a sentence in another language. Even though machine learning approaches have been successfully employed for performing linguistic processing tasks for many years, performance is sometimes hindered by the fact that traditional machine learning approaches learn simple decision functions aimed at discriminating between small sets of target values, an output space that is much

simpler than the complex output spaces of typical natural language processing tasks. Structured prediction, an emerging subfield of machine learning, specifically deals with learning in the types of complex output spaces that are prevalent in natural language processing, but also in for example, bioinformatics and computer vision.

In this dissertation, we present constraint satisfaction inference (CSI) as a new framework for structured prediction, which was designed with three objectives in mind. First, the approach should allow for efficient search in structured output spaces without severely restricting the structural dependencies that can be modelled. Secondly, training of structured prediction models should not be more expensive than training of traditional multi-class classification models. Thirdly, the structured prediction framework should be compatible with arbitrary existing learning techniques, such that it can be used with any learning algorithm that is able to learn multi-class classification tasks.

In Chapter 2, we define structured prediction as the joint prediction of multiple interrelated output values. This abstract definition covers all the popular structured prediction tasks in natural language processing such as syntactic parsing, letter-phoneme conversion and information extraction. After this definition, we provide an overview of existing work in structured prediction. All approaches to structured prediction somehow divide the structured output value into smaller output values, which can be treated as multi-class classification cases. Yet, the approaches differ with respect to how the uncertainty resulting from those local classifications is resolved. Prior to the introduction of structured prediction techniques, such uncertainty resolution came down to selecting the value deemed most likely by the local classifier. In most structured prediction techniques, all local uncertainty is delegated to an inference procedure that takes into account structural dependencies between the output variables to resolve local uncertainty in a way that optimises the quality of the global output structure. While shown to be effective, such approaches have the disadvantage of making this inference step costly, since the latter essentially has to explore the complete output space of the structured prediction task in order to evaluate what local value assignments optimise global output quality. Some structured prediction techniques perform full inference not only for prediction, but as part of their training procedure as well, which makes training prediction models rather expensive. The only option to keep inference procedures efficient is to make assumptions about the dependencies that exist between output variables. Unfortunately, those assumptions restrict the types of structural

information that can be taken into account during inference, and therefore, may harm the performance.

Chapter 3 presents the constraint satisfaction inference framework, which aims to resolve the abovementioned issues with existing techniques. Structured prediction in constraint satisfaction inference proceeds according to two steps. First, one or more base classifiers predict a weighted constraint satisfaction problem (WCSP) based on the input. Secondly, a constraint solver is employed to solve the WCSP and obtain the structured output value. Given the extensive research on constraint satisfaction and combinatorial optimisation, many algorithms exist to perform the latter step. The main contribution of this dissertation is in the way a weighted constraint satisfaction problem is formulated in order to map input instances to structured output values.

Central to the structured prediction approach in constraint satisfaction inference is a different way of modelling global uncertainty. Like most other structured prediction techniques, structured output values are decomposed into smaller classification cases. However, uncertainty in predictions made by base classifiers is always resolved locally. As an alternative means to communicate local uncertainty to the inference procedure, base classifiers are instructed to predict overlapping and potentially conflicting parts of the output structure. The uncertainty to be resolved by the inference procedure, then, corresponds to conflicts between such predictions. The solution space resulting from this method tends to be much smaller than the true output space of the task, and as a result, inference may be considerably cheaper. In some cases, even exhaustive search of this space is possible. Therefore, arbitrary structural dependencies may be taken into account during inference. Modelling such dependencies takes the form of soft constraints on the output space predicted by base classifiers, and enforced by the inference procedure.

To evaluate the potential of the constraint satisfaction inference framework, we apply it to three challenging natural language processing tasks that deal with structured output spaces: sequence labelling, dependency parsing, and machine translation.

Chapter 4 reports on experiments with four processing tasks that can be formulated as sequence labelling problems: syntactic chunking, named-entity recognition, letter-phoneme conversion, and morphological analysis. When applied to these tasks, constraint satisfaction inference attains results comparable to other state-of-the-art structured

prediction approaches. Importantly, because of the way constraint satisfaction inference defines the search space of the inference procedure, inference for all four tasks could be performed by exhaustive search, whereas many structured prediction approaches rely on the Viterbi algorithm, which severely restricts the type of structural dependencies that can be modelled.

Chapter 5 deals with dependency parsing. In this chapter, it is shown how multiple base classifiers, each predicting constraints on different aspects of the output structure, are combined by the inference procedure, and that parsing performance consistently improves with each type of constraint added. Experiments with ten different languages show that constraint satisfaction inference using only basic features attains above-average performance when compared to existing systems applied to the same data sets. Again, the alternative approach to uncertainty modelling pays off in terms of a smaller solution space for the inference procedure. Because of that, our approach is able to perform labelled dependency parsing in a single step, whereas comparable dependency parsers require two steps: one to find an unlabelled dependency tree, and another to label its edges.

Chapter 6 describes how constraint satisfaction inference can be applied to machine translation, the most challenging of the processing tasks tackled in this dissertation. Its output space is effectively infinitely large, since any sentence in the target language might be a potential translation of the input sentence. For this reason, it is essential to restrict the cost of inference, one of the main objectives of constraint satisfaction inference. In experiments with four different Dutch to English translation tasks, we compared constraint satisfaction inference with an existing statistical machine translation system, and found that constraint satisfaction inference succeeds in meeting this objective for machine translation as well. Our approach to machine translation is faster than the competing system, while at the same time, it produces better translations on three out of four translation tasks.

In Chapter 7, we conclude that constraint satisfaction inference meets all three of the research objectives formulated for this study. Given that throughout this dissertation, experiments with a variety of structured prediction tasks have consistently shown that good performance is attainable with constraint satisfaction inference, we argue that constraint satisfaction inference is a structured prediction framework that can compete with existing state-of-the-art approaches, and thus, that trade-offs different from those made in the

design of existing structured prediction techniques can still lead to state-of-the-art performance. These findings may contribute to an improved understanding of the issues surrounding structured prediction.

Better than a Substantial Increase

Jaap van den Herik
TiCC, Tilburg

In the December issue of the BNVKI newsletter, the 2008 defences of AI and AI-related Ph.D. theses were published in the context of SIKS, NBIC, and the BNVKI activities. The total number of theses had increased from 46 (in 2007) to 55 (in 2008). These publications evoked two reactions which we gladly incorporate in this contribution. First, Maurice Bruynooghe (Leuven University) informed me on more Ph.D. thesis defences that had taken place under his shared supervision. So, with much pleasure we report on two successful Belgium Ph.D. defences in 2008 in this issue. The Editorial Board congratulates Daan Fierens and Alvaro Cortés-Calabuig. In the same email we received two new Belgium announcements (see the list below). Second, Ruben Kok (NBIC) informed us on the successful completion of the Ph.D. work at the Leiden University. Hence, we congratulate Kai Ye with achieving this milestone.

For the sake of completeness we publish in Table 1 the updated results and remark that the current figures are even better than the Substantial Increased results published in December 2008.

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
2008	58	35
Grand Total	507	199

Table 1: Scores and grand total.

The main correction in the Grand Total should be followed by all kind of minor corrections on the text

published in the December issue of the BNVKI newsletter (pp. 152-157). We leave these corrections as an exercise to our readers.

The new year 2009 asks already for attention. We received many announcements and are pleased to list them below. Moreover, we repeat the announcement of the inaugural addresses. The title of the dual inaugural address has been changed with respect to the previous announcement. A symposium *Computers and Arts* will be held in close cooperation with the Van Gogh Museum in advance to the inaugural address by Van den Herik and Postma.

ADDITIONAL PH.D. THESES (2008)

Daan Fierens (July 1, 2008). *Learning Directed Probabilistic Logical Models from Relational Data*. Leuven University. Promotores: Prof.dr. H. Blockeel (KUL) and Prof.dr. M. Bruynooghe (KUL).

Kai Ye (December 18, 2008). *Novel Algorithms for Protein Sequence Analysis*. Leiden University. Promotor: Prof.dr. A. IJzerman (UL).

Alvaro Cortés-Calabuig (December 19, 2008). *Towards a Logical Reconstruction of a Theory for Locally Complete Databases*. Leuven University. Promotores: Prof.dr. M. Denecker (KUL) and Prof.dr. M. Bruynooghe (KUL).

THE PH.D. THESIS ANNOUNCEMENTS FOR 2009

Muhammad Subianto (January 14, 2009). *Understanding Classification*. Universiteit Utrecht. Promotor: Prof.dr. A.P.J.M. Siebes (UU).

Rasa Jurgelenai (January 19, 2009). *Symmetric Causal Independence Model*. Radboud Universiteit Nijmegen. Promotor: Prof.dr. T.M. Heskes (RUN).

Willem Robert van Hage (January 19, 2009). *Evaluating Ontology-Alignment Techniques*. Vrije Universiteit Amsterdam. Promotor: Prof.dr. G. Schreiber (VU).

Rogers wod'Olobo Okot-Uma (February 6, 2009). *Improving International Relations Conferences Through Virtual Interactions*. Technische Universiteit Delft. Promotores: Prof.dr. H.G. Sol (TUD) and Prof.dr. S. Qureshi (University of Nebraska at Omaha, USA).

Niels Landwehr (February 12, 2009). *Trading Expressivity for Efficiency in Statistical Relational Learning*. Leuven University. Promotor: Prof.dr. L. de Raedt (KUL).

Maarten Mariën (February 19, 2009). *Model Generation for ID-logic*. Leuven University. Promotor: Prof.dr. M. Denecker (KUL).

Josephine Nabukenya (March 3, 2009). *Improving the Quality of Organisational Policy Making using Collaboration Engineering*. Radboud Universiteit Nijmegen. Promotors: Prof.dr. E. Proper (RUN) and Prof.dr.ir. G.-J. de Vreede (University of Nebraska at Omaha, USA). Co-promotor: Dr. P. van Bommel (RUN).

Abrice Colas (March 4, 2009). *Data Mining Scenarios for the Discovery of Subtypes and the Comparison of Algorithms*. Leiden University, LIACS. Promotor: Prof.dr. J.N. Kok (UL).

Ronald Poppe (April 2, 2009). *Discriminative Vision-Based Recovery and Recognition of Human Motion*. Universiteit Twente. Promotor: Prof.dr.ir. A. Nijholt (UT). Co-promotor: Dr. M. Poel (UT).

Sietse Overbeek (April 24, 2009). *Bridging Supply and Demand for Knowledge Intensive Tasks – Based on Knowledge, Cognition, and Quality*. Radboud Universiteit Nijmegen. Promotor: Prof.dr. E. Proper (RUN).

André de Vries (June 3, 2009). *The Value of Haplotypes*. Rijksuniversiteit Groningen. Promotor: Prof.dr. R.M.W. Hofstra (RUG).

Steven de Jong (June 4, 2009). *Fairness in Multi-Agent Systems*. Universiteit Maastricht. Promotors: Prof.dr. H.J. van den Herik (UvT) and Prof.dr. E.O. Postma (UvT). Co-promotor: Dr. K. Tuyls (TU/e).

Frits Reul (June 17, 2009). *New Architectures for Computer Chess*. Tilburg University. Promotor: Prof.dr. H.J. van den Herik (UvT). Co-promotor: Dr. J.W.H.M. Uiterwijk (UM).

Laurens van der Maaten (June 23, 2009). *Feature Extraction from Visual Data*. Universiteit van Tilburg. Promotors: Prof.dr. E.O. Postma (UvT) and Prof.dr. H.J. van den Herik (UvT). Co-promotor: Dr. A.G. Lange (RACM).

INAUGURAL ADDRESSES

In the next months the following four inaugural addresses will take place.

Prof.dr.ir. U. Kaymak (March 6, 2009). *The Information Metamorphosis in Economics*. Erasmus University Rotterdam, Aula, Rotterdam, 16.00 hours.

Prof.dr. H.J. van den Herik and Prof.dr. E.O. Postma (March 27, 2009). *Geloof in Computers*. Tilburg University, Aula, Tilburg, 16.15 hours.

Prof.dr. A.F. Harmsen (April 17, 2009). *Knowledge Management of Global Work*. Maastricht University, Aula, Maastricht, 16.30 hours.

Prof.dr.ir. W. Kraaij (June 25, 2009). *Information Filtering and Aggregation*. Radboud University Nijmegen.



Symposium “Innovating IT” – Surfing the fourth wave

Date: March, 5, 9.15-17.15h

Location: Aula, Tilburg University

This year, the study Informatiekunde at Tilburg University celebrates its 25th anniversary. The lustrum symposium organized at March 5 has taken as its theme “Innovating IT” – Surfing the fourth wave.

It will discuss the new ways in which IT supports business innovation and co-creation of value nowadays. It also addresses the question of the maturity of IT itself, how it should be improved, and what the possible role of service-orientation is in that respect.

The theme will be addressed from multiple perspectives, including a client (CIO) perspective and a research perspective. Distinguished speakers include prof. N. Venkatraman (Boston Univ) and dr. I. Fikouras (Ericsson), as well as secretary of state De Jager.

The language is Dutch and English.

SIKS students are invited to participate using support of SIKS. You should register via the website www.vijfmaat.nl. You can check the “vrijkaart” option and fill in the code SIKS.

Advanced SIKS Course “Probabilistic Methods for Entity Resolution and Entity Ranking”

INTRODUCTION

On April 20 and 21, 2009, the School for Information and Knowledge Systems (SIKS) will organize an advanced course on “Probabilistic Methods for Entity Resolution and Entity Ranking”.

The course takes two days, will be given in English and is part of the 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. Especially Ph.D. students working on the SIKS-foci “Data management, Storage and Retrieval” and “Web-based Information Systems” are strongly encouraged to participate.

Date: 20-21 April 2009

Location: Conference Center Woudschoten, Zeist

Scientific Directors: Dr.ir. Djoerd Hiemstra (UT) and Dr.ir. Maurice van Keulen (UT)

PROGRAM

The program is not available yet; a first draft will be put on the website in due course.

REGISTRATION

Details on registration will be made available on the website

Basic SIKS Courses “Learning and Reasoning” and “Information Retrieval”

INTRODUCTION

From May 25-28, 2009, the School for Information and Knowledge Systems (SIKS) organizes two basic courses “Learning and Reasoning” and

“Information Retrieval”. Both courses will be given in English and are part of the obligatory Basic Course Program for SIKS-Ph.D. students.

Although these courses are primarily intended for SIKS-Ph.D. students, other participants are not excluded. However, their number of passes will be restricted and depends on the number of SIKS-Ph.D. students taking the course.

Date: May 25-28, 2009

Location: Landgoed Huize Bergen in Vught.

Scientific Directors:

Dr. A. Ten Teije (VU), *Learning and Reasoning* (25-26 May) and Prof.dr.ir. Th.P. van der Weide (RUN) *Information Retrieval* (27-28 May)

PROGRAM

The program is not known yet, but may contain the following topics:

Learning and Reasoning:

Probabilistic reasoning / Introduction Bayesian networks; Introduction machine learning; Reinforcement learning; Learning and reasoning for information access; Qualitative reasoning; Argumentation systems; Model based reasoning.

Information Retrieval:

Capita selecta IR (formalisms, models); Probabilistic models for IR; Multi-media retrieval; Empirical methods for IR; Multi-media retrieval; XML retrieval; Web mining and web retrieval; Automatic query improvement.

REGISTRATION

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

Deadline for registration for SIKS-Ph.D. students: May 1, 2009

After that date, applications to participate will be honoured in a first-come first-serve manner. Of course, applications to participate from other interested groups are welcome already. They will receive a notification whether they can participate as soon as possible.

For registration you are kindly requested to fill in the registration form at the SIKS website.

CAiSE-DC2009 for SIKS-Ph.D. Students

<http://caise09.thenetworkinstitute.eu/doctoral.php>

Date: 9-10 June 2009, Amsterdam, The Netherlands (held in conjunction with CAiSE09)

Submission deadline: February, 23, 2009

The Doctoral Consortium is supported by SIKS. SIKS has reserved a fixed number of places. If you want to make use of these, just submit your paper according to the instructions. You will then be informed about the further procedure briefly after February 23.

Admission to the DC will include admission to the CAiSE workshops on Monday and Tuesday as well as to the introductory keynote on Wednesday.

The accepted DC papers will be published along with the CAiSE workshop proceedings at the CEUR website.

Important dates

February 23, 2009	Paper submission deadline
March 31, 2009	Notification of acceptance
April 30, 2009	Final camera-ready copy of paper
June 3, 2009	Copy of presentation supplied to organizers
June 9-10, 2009	Workshop, Amsterdam, The Netherlands

SUBMISSION INSTRUCTIONS

To apply for participation at the Doctoral Consortium, please submit your paper via www.easychair.org/conferences/?conf=caisedc2009. Submissions must be made in PDF format, by the deadline stated, and the paper must conform to the Springer's LNCS format.

The paper is restricted to 4000 words (approximately 8 pages). Submissions must be single-author, but the name of the supervisor should also be mentioned within the paper.

PC Co-chairs and Workshop Organizers: Sjaak Brinkkemper, Utrecht University; Hans Weigand, University of Tilburg.

Summer School on "Service and Software Architectures, Infrastructures and Engineering"

<http://www.ssme2009.tsl.gr>

Date: June 16-19, 2009

Location: Heraklion, Crete

Supported by SIKS (see below)

The Service and Software Architectures, Infrastructures and Engineering (SSAIE) Summer School brings together the best international experts on software and services and graduate students, young researchers and professionals from leading academic, research and industrial organizations across Europe and around the world.

In addition to high quality training, the Summer School helps forge a new research and scientific community on Service Science Management and Engineering (SSME). The Summer School fosters the free exchange of ideas and helps the participants to network and start new cooperative research projects.

The Summer School is organized by the Training and Summer School Collaboration Working Group (CWG), that brings together projects of the IST SSAIE unit (http://cordis.europa.eu/fp7/ict/ssai/home_en.html).

SIKS students can use this summer school for their educational program. For your convenience, SIKS has reserved a limited number of places. If you want to apply for one of those places (which includes attendance to the program and full accommodation, but not traveling costs), then send a short motivated request to Hans Weigand, h.weigand@uvt.nl, before March 1. Depending on the number of applications, a selection will have to be made.

ANNOUNCEMENTS

18th Annual Belgian-Dutch Conference on Machine Learning (Benelearn 09)

2nd Call for Papers and Extended Abstracts

May 18-19, 2009
Tilburg University

Submission deadline: February 21, 2009
<http://benelearn09.uvt.nl/>

SCOPE

Benelearn is the annual machine-learning conference of Belgium and The Netherlands. It serves as a forum for researchers to exchange ideas, present recent work, and foster collaboration in the broad field of Machine Learning and its applications.

Benelearn 09 will be organised by the Tilburg centre for Creative Computing of Tilburg University. The conference will take place on May 18 and 19, 2009 at Tilburg University, Tilburg, the Netherlands.

Contributions are now being invited that are relevant to machine learning and related disciplines in a broad sense.

TOPICS

We invite the submission of extended abstracts and papers on all aspects of machine learning and related disciplines, including, but not limited to: Kernel Methods; Web/Link Mining; Bayesian Networks; Case-based Learning; Computational Learning Theory; Data Mining; Evolutionary Computation; Hybrid Learning Systems; Graphical Models; Inductive Learning; Inductive Logic Programming; Knowledge Discovery in Databases; Language Learning; Learning and Problem Solving; Learning by Analogy; Learning in Multi-Agent Systems; Learning in Dynamic Domains; Learning for Bioinformatics; Multi-strategy Learning; Neural Networks; Reinforcement Learning; Robot Learning; Scientific Discovery; Meta-Learning; Statistical Learning; Probabilistic Logic Learning; Computational Models of Human Learning; Learning for Language and Speech; Applications of Machine Learning; Learning and Ubiquitous Computing.

SUBMISSION

Submissions are possible as either paper or extended abstract.

Papers should present original, completed and unpublished research. Presentation at the conference will be in the form of a talk.

Extended abstracts may present current, but also possible future research. For example, you may wish to outline a project that you are interested in, describe and discuss the Big Question in your field, describe and discuss a new or controversial idea, appeal for collaboration, or provide an overview of your career so far. Presentation at the conference will be in the form of a speed talk and a poster.

All submissions are to be formatted using the EACL 2009 style files (<http://www.eacl2009.gr/conference/authors>). Papers should have up to 8 pages; extended abstracts up to 2 pages.

Papers and extended abstracts should be submitted electronically, no later than Saturday, February 21, 2009. The only accepted format for submitted papers is PDF.

The reviewing process of the papers will be blind; thus these submissions should not include the authors' names and affiliations or any references to web sites, project names etc. revealing the authors' identity. Each paper submission will be reviewed by at least two members of the program committee. Extended abstracts will also be reviewed, but due to the nature of the extended abstracts reviewing will not be blind. All accepted submissions will be published in the workshop proceedings.

IMPORTANT DATES

February 21, 2009 - Deadline for paper submission
March 20, 2009 - Notification of acceptance
April 20, 2009 - Camera-ready copies due
May 18-19, 2009 - Belgian-Dutch Conference on Machine Learning

PROGRAMME COMMITTEE

Hendrik Blockeel, K.U. Leuven; Gianluca Bontempi, U.L. Bruxelles; Antal van den Bosch, Tilburg University; Walter Daelemans, University of Antwerp; Pierre Dupont, U.C. Louvain; Damien Ernst, University of Liège; Marieke van Erp, Tilburg University; Ad Feelders, Universiteit Utrecht; Bart Goethals, Antwerp University; Tom Heskes, Radboud University Nijmegen; Bernard Manderick, Vrije Universiteit Brussel; Raphaël Marace, University of Liège; Bart de Moor, K.U. Leuven; Martijn van Otterlo, K.U. Leuven; Justus Piater, University of Liège; Luc De Raedt, K.U. Leuven; Jan Ramon, K.U. Leuven; Yvan Saeys, Ghent University; Rodolphe Sepulchre, University of Liège; Evgueni Smirnov, Maastricht University; Maarten van Someren, Universiteit van Amsterdam; Kristel Van Steen, University of Liège; Herman Stehouwer, Tilburg University; Johan Suykens, K.U. Leuven; Koenraad VanHoof, Universiteit Hasselt; Michel Verleysen, U.C. Louvain; Paul Vitanyi, Centrum voor Wiskunde en Informatica; Louis Wehenkel, University of Liège; Menno van Zaanen, Tilburg University. Others to be confirmed.

ORGANIZING COMMITTEE

- Marieke van Erp; M.G.J.vanErp (at) uvt.nl
- Herman Stehouwer; J.H.Stehouwer (at) uvt.nl
- Menno van Zaanen; mvzaanen (at) uvt.nl

Tilburg centre for Creative Computing, Department of Communication and Information Sciences, Tilburg University The Netherlands.

CONTACT

Menno van Zaanen, Tilburg centre for Creative Computing, Department of Communication and Information Sciences, Tilburg University, The Netherlands. Email: mvzaanen (at) uvt.nl.

Workshop website: <http://benelearn09.uvt.nl/>

2nd International Conference on Human-Robot Personal Relationships

Tilburg University, The Netherlands

June 11-12, 2009

Within the fields of Human-Computer Interaction and Human-Robot Interaction, the past few years have witnessed a strong upsurge of interest in the more personal aspects of human relationships with artificial partners. In 2008 Maastricht University organised the 1st International Conference on Human-Robot Relationships. This was inspired by the defence of David Levy's (2007) thesis, *Intimate Relationships with Artificial Partners*. The thesis attracted wide media publicity as did the 1st conference. Meanwhile, the Maastricht research group has moved to Tilburg University and therefore this university is organizing and hosting the 2nd International Conference on Human-Robot Personal Relationships, during the period June 11-12, 2009.

Conference sessions are planned on the following topics: Robot Emotions; Robot Personalities; Gender Approaches; Affective Approaches; Psychological Approaches; Sociological Approaches; Roboethics; Philosophical Approaches.

We welcome contributions in the form of an extended abstract and/or paper.

IMPORTANT DATES

February 28, 2009 - Deadline for extended abstracts (max 1500 words) or papers
April 18, 2009 - Notification of acceptance
15 May, 2009 - Deadline for final versions

CONFERENCE PROCEEDINGS

Submissions will be peer-reviewed. A selection of papers will be considered for inclusion in an international volume of the proceedings to be

published in the Journal of Social Robotics. See <http://www.springer.com/new+%26+forthcoming+titles+%28default%29/journal/12369>

The language of the conference is English.

Submission address: Email: hrpr@uvt.nl

TiCC, Tilburg centre for Creative Computing
Faculty of Humanities, Tilburg University, Tilburg,
The Netherlands

Website: <http://hrpr.uvt.nl/>

Conference Venue: Tilburg University, Tilburg,
The Netherlands. How to reach us:
<http://www.tilburguniversity.nl/contact/route>

Programme Chair: Professor Jaap van den Herik,
Tilburg University

PROGRAMME COMMITTEE

Dr. Christoph Bartneck, Eindhoven University of Technology; Professor Myriam Diocaretz, Tilburg University; Professor Jonathan Gratch, University of Southern California; Dr. Jettie Hoonhout, Philips Research; Professor Marli Huijter, Hogeschool Den Haag; Ir. Jeroen Janssens M.Sc., Tilburg University; Professor Emiel Krahmer, Tilburg University; Dr. David Levy, London, UK; Professor Maaïke Meijer, Maastricht University; Dr. Bernt Meerbeek, Philips Research; Professor Cees Midden, Eindhoven University of Technology; Professor Mark Neerinx, Delft University of Technology; Professor Eric Postma, Tilburg University; Professor Corien Prins, Tilburg University.

REGISTRATION

To register please fill in the Human Robot 2009 Registration Form and fax it to (+31) (0)13-466 2892. Registration fees are as follows:

	Before June 1, 2009	After June 1, 2009
Non-Students with dinner	Euro 175	Euro 225
Non-Students without dinner	Euro 125	Euro 175
Ph.D. Students with dinner	Euro 125	Euro 150
Ph.D. students without dinner	Euro 75	Euro 100
Students without dinner	Euro 25	Euro 25

For more information please contact the organizing committee & secretariat: Joke Hellemons, email: J.W.Hellemons@uvt.nl.

Call for Papers

MLDM 2009

6th International Conference on Machine Learning and Data Mining

Leipzig, Germany, July 23-25, 2009
<http://www.mldm.de>

OBJECTIVES AND TOPICS

The MLDM'2009 conference is the sixth event in a series of Machine Learning and Data Mining meetings, initially organised as international workshops. The aim of MLDM'2009 is to bring together from all over the world researchers dealing with machine learning and data mining, in order to discuss the recent status of the research in the field and to direct its further developments. Basic research papers as well as application papers are welcome. All kinds of applications are welcome, but special preference will be given to multimedia-related applications, biomedical applications, and webmining.

Paper submissions should be related but not limited to any of the following topics: association rules; applications of clustering; applications in medicine; aspects of data mining; automatic semantic annotation of media content; Bayesian models and methods; conceptional learning and clustering; case-based reasoning and learning; classification and interpretation of images, text, video; classification and model estimation; case-based reasoning and associative memory; content-based image retrieval; decision trees; deviation and novelty detection; ensemble methods; feature grouping, discretization, selection and transformation; feature learning; frequent pattern mining; high-content analysis of microscopic images in medicine, biotechnology and chemistry; goodness measures and evaluation (e.g., false discovery rates); inductive learning including decision tree and rule induction learning; knowledge extraction from text, video, signals and images; learning/adaption of recognition and perception; learning of internal representations and models; learning of appropriate behaviour; learning of action patterns; learning in image pre-processing and segmentation; learning and adaptive control learning robots; learning in process automation; learning for handwriting recognition; learning of semantic inferencing rules; learning of ontologies; learning of visual ontologies; mining gene data bases and biological data bases; mining images, temporal-spatial data, images from remote sensing; mining text documents; mining structural representations such as log files, text documents

and htm-documents; mining financial or stockmarket data; mining images in computer vision; mining images and texture; mining motion from sequence network analysis and intrusion detection; neural methods; nonlinear-function learning and neural-net-based learning; organisational learning and evolutionary learning; probabilistic information retrieval; rule induction and grammars; retrieval methods; real-time event learning and detection; selection bias; sampling methods; selection with small samples; similarity measures and learning of similarity; statistical learning and neural-net-based learning; support vector machines; subspace methods; statistical and conceptual clustering methods: basics; statistical and evolutionary learning; speech analysis; symbolic learning and neural networks in document processing; time series and sequential pattern mining; text mining; visualization and data mining; video mining.

CONFERENCE CHAIR

Petra Perner, Institute of Computer Vision and applied Computer Sciences, IBAI Leipzig/Germany.

PROGRAM COMMITTEE

Agnar Aamodt, NTNU, Norway; Jacky Baltes, University of Manitoba, Canada; Max Bramer, University of Portsmouth, UK; Horst Bunke, University of Bern, Switzerland; Krzysztof Cios, Virginia Commonwealth University, USA; Christoph F. Eick, University of Houston, USA; Ana Fred, Technical University of Lisbon, Portugal; Giorgio Giacinto, University of Cagliari, Italy; Makoto Haraguchi, Hokkaido University Sapporo, Japan; Robert J. Hilderman, University of Regina/Canada; Tin Kam Ho, Bell Laboratories, USA; Atsushi Imiya, Chiba University, Japan; Horace Ip, City University, Hong Kong; Abraham Kandel, University of South Florida, USA; Dimitrios A. Karras, Chalkis Institute of Technology, Greece; Adam Krzyzak, Concordia University, Montreal, Canada; Longin Jan Latecki, Temple University Philadelphia, USA; Tao Li, Florida International University, USA; Brian Lovell, University of Queensland, Australia; Mariofanna Milanova, University of Arkansas at Little Rock, USA; Thang V. Pham, University of Amsterdam, Netherlands; Maria da Grazia Pimentel; Petia Radeva, Universitat Autònoma de Barcelona, Spain; Michael Richter, University of Calgary, Canada; Fabio Roli, University of Cagliari, Italy; Linda Shapiro, University of Washington, USA; Sameer Singh, Loughborough University, UK; David Steinberg, Tel Aviv University, Israel; Francesco Tortorella, Università degli studi di Cassino, Italy; Patrick Wang, Northeastern University, USA.

IMPORTANT DATES

January 6, 2009 - Deadline for paper submission
March 6, 2009 - Notification of acceptance
April 27, 2009 - Final paper submission

Authors can submit their papers in long or short version.

LONG PAPERS

The paper must be formatted in the Springer LNCS format. They should have at most 15 pages. Papers will be reviewed by the program committee. Accepted long papers will appear in the proceedings book *Machine Learning and Data Mining in Pattern Recognition* published by Springer Verlag in the LNAI series. Extended versions of selected papers will be published in a special issue of an international journal after the workshop.

SHORT PAPERS

Short papers are also welcome and can be used to describe work in progress or project ideas. They should have not more than 5 pages, formatted in Springer LNCS format. Accepted short papers will be presented as poster in the poster session. They will be published in a special poster proceedings book.

SPECIAL ISSUE

Extended versions of selected papers will be published in a special issue of an international journal after the conference. Please submit the electronic version of your camera-ready paper through the COMMENCE conference management system. If you have any problems with the system please do not hesitate to contact info@mldm.de.

Conference web site: <http://www.mldm.de>
All Publications see: <http://www.ibai-publishing.org>

Call for Papers (research track)

Benelux Conference on Artificial Intelligence (BNAIC)

October 29-30, 2009
<http://www.wis.win.tue.nl/bnaic2009>

See also: cfp industry track:
<http://www.wis.win.tue.nl/bnaic2009/industry.html>

BNAIC is the Benelux Conference on Artificial Intelligence and is one of the main activities of the BNVKI (Benelux Association for Artificial Intelligence). The main goals of BNAIC are two-fold:

- to bring together the AI researchers in the Benelux to meet and present research activities;
- to present high-quality research results, possibly already published in international conferences or journals.

The format of BNAIC is therefore a mixture of a meeting place and a forum for high-quality research results. This forms a balance that has proven to be successful in the previous years, as is shown by the high number of participants each year.

The 21st Benelux Conference on Artificial Intelligence (BNAIC 2009) will be held at the Eindhoven University of Technology and is organized under the auspices of the Benelux Association for Artificial Intelligence (BNVKI) and the Dutch Research School for Information and Knowledge Systems (SIKS). The conference aims at presenting an overview of state-of-the-art research in artificial intelligence in Belgium, The Netherlands and Luxembourg. This year's invited keynote talks will be given by Prof. Wolfram Burgard (University of Freiburg) and Prof. Peter Flach (University of Bristol).

IMPORTANT DATES

June 12, 2009	Deadline for paper submissions
August 15, 2009	Author notification
September 15, 2009	Deadline for camera-ready submission
October 29-30, 2009	BNAIC'09 Conference

Possible topics of submissions include, but are not limited to: AI for Ambient Intelligence; AI for Games & Entertainment; Embodied Artificial Intelligence; Intelligent Agents & Multi-Agent Systems; Knowledge Representation; Ontologies; Semantic Web-Techniques & Technologies; Knowledge Management; Knowledge-based Systems; Logic in AI; Logic Programming; Natural Language Processing; Speech & Image Processing & Understanding; Cognitive Modeling; Reinforcement Learning; Planning & Scheduling; Knowledge Discovery and Data Mining; Machine Learning; Classification; Clustering; Pattern Discovery; Process Mining; Visualization; Case-Based Reasoning; Constraint Programming; Evolutionary Algorithms; Neural Networks; Verification & Validation; Search & Retrieval; Personalization & Adaptation; Recommender Systems; Hybrid Intelligent Systems; AI in law, music, art, education, tutoring, medicine, bioinformatics, software, e-commerce, logistics, robotics, and other business & industry applications.

The following three types of submissions are invited:

TYPE A: REGULAR PAPERS

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

TYPE B: COMPRESSED CONTRIBUTIONS

Papers that have been accepted after June 1st, 2008 for AI-related refereed conferences or journals can be resubmitted and will be accepted as compressed contributions. Authors are invited to submit the officially published version (without page restriction) together with a one or two-page abstract. B-Papers will be accepted for either oral or poster presentation. The abstract of the paper will be published in the proceedings. Every author may submit at most one B-paper of which they are the corresponding author, and only if they do not submit any A-paper as corresponding author.

TYPE C: DEMONSTRATIONS & APPLICATIONS

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

All submissions should be typeset according to the BNAIC submission format. For detailed author instructions and style files for LaTeX and MS Word users please consult the BNAIC webpage www.wis.win.tue.nl/bnaic2009/instructions.html.

Researchers from industry are encouraged to submit papers presenting their applications and experiences to the Industry Track (see <http://www.wis.win.tue.nl/bnaic2009/industry.html>).

Papers and demonstration summaries should be submitted electronically by June 12th, 2009. Submission implies willingness of at least one author to register for BNAIC'09 and present the paper. For each paper at least one of the authors is required to register. Authors keep the copyright of their submissions. The BNAIC Proceedings are published under ISSN series number 1568-7805.

ORGANIZATION

Programme Committee Chairs:

Toon Calders, Eindhoven University of Technology, the Netherlands; Karl Tuyls, Eindhoven University of Technology, the Netherlands.

Industrial Track Chair:

Mykola Pechenizkiy, Eindhoven University of Technology, the Netherlands.

PROGRAMME COMMITTEE (TO BE EXTENDED)

Ameen Abu-Hanna, Universiteit van Amsterdam; Tony Belpaeme, University of Plymouth; Geert Jan Bex, Universiteit Hasselt; Cor Bioch, Erasmus Universiteit Rotterdam; Hendrik Blockeel, Katholieke Universiteit Leuven; Tibor Bosse, Vrije Universiteit Amsterdam; Pascal Bouvry, Université du Luxembourg; Frances Brazier, Vrije Universiteit Amsterdam; Maurice Bruynooghe, Katholieke Universiteit Leuven; Walter Daelemans, Universiteit Antwerpen; Mehdi Dastani, Universiteit Utrecht; Patrick De Causmaecker, Katholieke Universiteit Leuven; Martine De Cock, Universiteit Gent; Jeroen De Knijf, Universiteit Antwerpen; Mathijs de Weerd, Technische Universiteit Delft; Frank Dignum, Universiteit Utrecht; Virginia Dignum, Universiteit Utrecht; Marco Dorigo, Université Libre de Bruxelles; Kurt Driessens, Katholieke Universiteit Leuven; Pierre Geurts, Université de Liège; Bart Goethals, Universiteit Antwerpen; Pascal Gribomont, Université de Liège; Tom Heskes, Radboud Universiteit Nijmegen; Koen Hindriks, Technische Universiteit Delft; Tomas Klos, Technische Universiteit Delft; Walter Kosters, Universiteit Leiden; Ben Krose, Universiteit van Amsterdam; Bernard Manderick, Vrije Universiteit Brussel; John-Jules Meyer, Universiteit Utrecht; Anton Nijholt, Universiteit Twente; Ann Nowé, Vrije Universiteit Brussel; Maja Pantic, Universiteit Twente; Rob Potharst, Erasmus Universiteit Rotterdam; Jan Ramon, Katholieke Universiteit Leuven; Nico Roos, Universiteit Maastricht; Martijn Schut, Vrije Universiteit Amsterdam; Ida Sprinkhuizen-Kuyper, Radboud Universiteit Nijmegen; Jan Struyf, Katholieke Universiteit Leuven; Johan Suykens, Katholieke Universiteit Leuven; Dirk Thierens, Universiteit Utrecht; Jos Uiterwijk, Universiteit Maastricht; Antal van den Bosch, Universiteit van Tilburg; H.Jaap van den Herik, Universiteit van Tilburg; Peter van der Putten, Universiteit Leiden; Leon van der Torre, Université du Luxembourg; Katja Verbeeck, Katholieke Hogeschool Sint Lieven; Frans Voorbraak, Universiteit van Amsterdam; Louis Vuurpijl, Radboud Universiteit Nijmegen; Ton Weijters, Technische Universiteit Eindhoven; Marco Wiering, Universiteit Groningen; Jef Wijsen, Université de Mons-Hainaut; Cees Witteveen, Technische Universiteit Delft.

CONFERENCES, SYMPOSIA WORKSHOPS

MARCH 30-31, 2009

ENLG2009: 12th European Workshop on Natural Language Generation. Athens, Greece.
<http://enlg2009.uvt.nl/>

MARCH 31-APRIL 1, 2009

Second International Workshop on Social Computing, Behavior Modeling, and Prediction. Phoenix, AZ, USA.
<http://www.public.asu.edu/~huanliu/sbp09/>

MAY 10-13, 2009

ACS/IEEE AICCSA'09: the 7th ACS/IEEE International Conference on Computer Systems and Applications. Rabat, Morocco.
<http://www.congreso.us.es/aiccsa2009>

MAY 18-19, 2009

18th Annual Belgian-Dutch Conference on Machine Learning (Benelearn 09). Tilburg, The Netherlands.
<http://benelearn09.uvt.nl/>

MAY 29-30, 2009

3IA'2009: The Twelfth International Conference on Computer Graphics and Artificial Intelligence. Athens, Greece.
http://3ia.teiath.gr/main_page.php

JUNE 3-5, 2009

2nd International Conference on Human-Robot Personal Relationships. Tilburg, The Netherlands.
<http://hrpr.uvt.nl/>

JUNE 3-5, 2009

The 3rd KES International Symposium on Agents and Multi-Agent Systems – Technologies and Applications (KES-AMSTA-09). Uppsala, Sweden.
<http://amsta-09.kesinternational.org>

JUNE 18-23, 2009

SENSORCOMM 2009: The Third International Conference on Sensor Technologies and Applications. Athens, Greece.
<http://www.iaria.org/conferences2009/SENSORCOMM09.html>

JUNE 25-27, 2009

HPCC-09: The 11th IEEE International Conference on High Performance Computing and Communications. Jointly with ISA-09: The 3rd IEEE International Conference on Information Security and Assurance. Korea University, Seoul, Korea.
<http://www.sersc.org/HPCC2009>
<http://www.sersc.org/ISA2009>

JULY 13, 2009

IJCAI-09 workshop on Cross-media Information Access and Mining (CIAM 2009). Pasadena, CA, USA.
<http://www.cs.kuleuven.be/~liir/conferences/CIAM2009/index.php>

JULY 23-25, 2009

MLDM 2009: the 6th International Conference on Machine Learning and Data Mining. Leipzig, Germany.
<http://www.mldm.de>

JULY 25-27, 2009

DMAMH'2009: 4th Workshop on Digital Media and its Application in Museum & Heritage. Qingdao, China.
<http://cise.sdkd.net.cn/dmamh>

AUGUST 6, 2009

KRAQ09: Knowledge and Reasoning for Answering Questions. ACL-IJCNLP 2009 workshop. Singapore.
<http://www.irit.fr/recherches/ILPL/kraq09.html>

AUGUST 9-11, 2009

The 4th International Conference on E-Learning and Games (Edutainment 2009). Banff, Canada.
<http://www.ask4research.info/edutainment/2009>

OCTOBER 29-30, 2009

21st Benelux Conference on Artificial Intelligence (BNAIC2009). Eindhoven, The Netherlands.
<http://www.wis.win.tue.nl/bnaic2009/>

Advertisements in the BNVKI Newsletter

Do you want to place a (job) advertisement in the Newsletter of the BNVKI?

- Whole page: € 400 for 1 issue; € 600 for 2 subsequent issues; € 900 for 6 subsequent issues.
- Half page: € 300 for 1 issue; € 450 for 2 subsequent issues; € 675 for 6 subsequent issues.

You reach an audience of AI professionals, academics and students. Your logo (with link to your company) will also be shown on the BNVKI/AIABN website during the period of advertisement.

Contact sien.moens@cs.kuleuven.be for additional information

**ADDRESSES
BOARD MEMBERS BNVKI**

Prof.dr. A. van den Bosch (chair)
Universiteit van Tilburg, Faculteit der Letteren
Taal en Informatica
P.O. Box 90153, 5000 LE Tilburg
Tel.: +31 13 4663117. E-mail: Antal.vdnBosch@uvt.nl

Prof.dr. A. Nowé (secretary)
Vrije Universiteit Brussel, Computational Modeling Lab
Department of Computer Science
Pleinlaan 2, B-1050 Brussels, Belgium
Tel.: +32 2 6293861
E-mail: asnowe@info.vub.ac.be

Dr. M.V. Dignum (treasurer and vice-chair)
Universiteit Utrecht, Inst. for Information & Computing Science
Cognition and Communication Group
P.O. Box 80089, 3508 TB Utrecht
Tel.: +31 30 2539429. E-mail: virginia@cs.uu.nl

Dr. J.W.H.M. Uiterwijk (BNVKI Newsletter)
Universiteit Maastricht
Maastricht ICT Competence Centre (MICC)
P.O. Box 616, 6200 MD Maastricht
Tel.: +31 43 3883490. E-mail: uiterwijk@micc.unimaas.nl

Dr. M.F. Moens (PR and sponsoring)
KU Leuven, Departement Computerwetenschappen
Celestijnenlaan 200A, 3001 Heverlee, Belgium
Tel.: +32 16 325383.
E-mail: sien.moens@cs.kuleuven.be

Dr. A. ten Teije (students)
Vrije Universiteit Amsterdam
Dept. of AI, Knowledge Representation and Reasoning Group
Room T343, De Boelelaan 1081A, 1081 HV Amsterdam
Tel.: +31 20 5987721. E-mail: annette@cs.vu.nl

EDITORS BNVKI NEWSLETTER

Dr. J.W.H.M. Uiterwijk (editor-in-chief)
Maastricht University
Maastricht ICT Competence Centre (MICC)
P.O. Box 616, 6200 MD Maastricht
Tel.: +31 43 3883490. E-mail: uiterwijk@micc.unimaas.nl

Prof.dr. E.O. Postma
Tilburg University
Faculty of Humanities, TiCC
P.O. Box 90153, 5000 LE Tilburg
Tel.: +31 13 4662433. E-mail: E.O.Postma@uvt.nl

Prof.dr. H.J. van den Herik
Tilburg University
Faculty of Humanities, TiCC
P.O. Box 90153, 5000 LE Tilburg
Tel.: +31 13 4668118. E-mail: H.J.vdnHerik@uvt.nl

M. van Otterlo, M.Sc.
University of Twente, Dept. of Computer Science
P.O. Box 217, 7500 AE Enschede
Tel.: +31 53 4894111. E-mail: otterlo@cs.utwente.nl

Dr. L. Mommers (section editor)
Universiteit Leiden, Dept. of Meta-Juridica
P.O. Box 9520, 2300 RA Leiden
Tel.: +31 71 5277849. E-mail: l.mommers@law.leidenuniv.nl

J. De Beule, M.Sc. (editor Belgium)
Vrije Universiteit Brussel, Artificial Intelligence Laboratory
Pleinlaan 2, B-1050 Brussels, Belgium
Tel.: +32 2 6293703
E-mail: joachim@arti.vub.ac.be

Dr. R.J.C.M. Starmans (section editor)
Manager Research school SIKS,
P.O. Box 80089, 3508 TB Utrecht
Tel.: +31 30 2534083/1454. E-mail: office@siks.nl

Ir. E.M. van de Vrie (section editor)
Open Universiteit Nederland, Opleiding Informatica
P.O. Box 2960, 6401 DL Heerlen
Tel.: +31 45 5762366. Email: Evert.vandeVrie@ou.nl

HOW TO SUBSCRIBE

The BNVKI-AIABN Newsletter is a direct benefit of membership of the BNVKI-AIABN: Benelux Association for Artificial Intelligence. Membership dues are €40 for regular members; €25 for doctoral students (AIO's); and €20 for students. In addition, members will receive access to the electronic version of the European journal *AI Communications*. The Newsletter appears bimonthly and contains information about conferences, research projects, job opportunities, funding opportunities, etc., provided enough information is supplied. Therefore, all members are encouraged to send news and items they consider worthwhile to the editorial office of the BNVKI/AIABN Newsletter. Subscription is done by payment of the membership due to Postbank no. 3102697 in The Netherlands (IBAN: NL 74 PSTB 0003 1026 97; BIC: PSTBNL21). Specify *BNVKI/AIABN* as the recipient, and please do not forget to mention your name and address. Sending of the BNVKI/AIABN Newsletter will only commence after your payment has been received. If you wish to conclude your membership, please send a written notification to the editorial office before December 1, 2009.

COPY

The editorial board welcomes product announcements, book reviews, product reviews, overviews of AI education, AI research in business, and interviews. Contributions stating controversial opinions or otherwise stimulating discussions are highly encouraged. Please send your submission by E-mail (MS Word or text) to newsletter@micc.unimaas.nl.

ADVERTISING

It is possible to have your advertisement included in the BNVKI/AIABN Newsletter. For further information about pricing etc., see elsewhere in the Newsletter or contact the editorial office.

CHANGE OF ADDRESS

The BNVKI/AIABN Newsletter is sent from Maastricht. The BNVKI/AIABN board has decided that the BNVKI/AIABN membership administration takes place at the editorial office of the Newsletter. Therefore, please send address changes to:

Editorial Office BNVKI/AIABN Newsletter
Marijke Verheij
MICC, Maastricht University
P.O. Box 616, 6200 MD Maastricht, the Netherlands
E-mail: newsletter@micc.unimaas.nl
<http://www.unimaas.nl/bnvki>