NEWSLETTER

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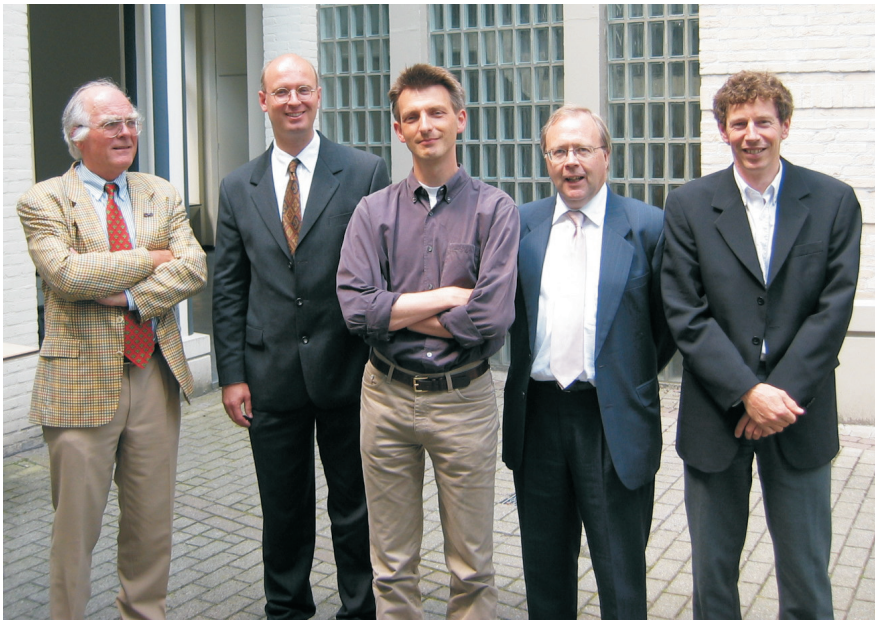

Brain, language, and AI

Intriguing inferences

Tools for legal drafting

News from the Belgium-Netherlands Association for Artificial Intelligence

The Sixth Framework Programme: Easy Money?

Editor-in-chief

A new round of European Union (EU) funding has begun in the Sixth Framework Programme: on June 17, 2003, the second call for proposals of the Information Society Technologies area was issued. This is the thematic area (or *priority*) that is the most relevant to BNVKI members. The deadline for submissions is October 15, 2003, and the amount of money involved is € 525 million. One of the novelties in this framework is the *integrated project* (IP). It has a broader scope than the projects in the previous Framework Programmes, which means that the IPs have more participants, have larger budgets, and are more general. Of course, participants in an consortium should be from multiple EU countries, but also to some extent from non-EU countries. The budget of an IP typically will be at least € 10 million.

There are three reasons why people refrain from submitting a proposal. First, there is the well-known principle of *matching:* the EU funds only 50 percent of the budget; the remainder is to be payed by the participants. This is not as bad as it sounds, since existing research can be brought in the project to serve as matching. However, not every research group has enough projects to provide sufficient matching. Second, there is the administration of the project. EU projects require a great deal of paperwork during and after the project. The international composition of the research consortium contributes to the effort. Luckily the costs for administration are fully fundable; they are not subject to matching. Hence, people can be appointed to deal with the formalities. Third, and most important, is the effort it takes to write a proposal. Since an IP must be very large, very international, and very innovative, many international meetings are necessary during the writing process.

The above observations raise the question whether a possible grant is worth the effort. Let us consider a small IP, which runs for 4 years with 50 researchers from 7 countries. The tables below show the budget, the costs of writing the proposal, and the actual project costs, respectively.

Budget.

Activity	Costs per annum (€)	Total costs (€)
25 FTE EU researchers	1,250,000	5,000,000
25 FTE matching researchers	1,250,000	5,000,000
1 FTE management	50,000	200,000
Total	*2,550,000*	*10,200,000*
Grant	***1,300,000***	***5,200,000***

Costs of proposal writing.

Activity	Costs (€)
20 Meetings (40 persons on average)	
Salaries (for talking)	1445,200
Travel and accommodation	792,500
Expenses	76,750
Salaries (for actual writing)	2536,800
Lobbying	98,700
Professional writer	49,850
Total	*4,999,800*

Actual project costs.

Activity	Actual costs (€)
Proposal writing	4,999,800
Management	200,000
25 FTE EU researchers	*p.m.*
Total	*5,199,900*

With a grant of € 5,200,000 and actual costs (without researchers) of 5,199,900, a mere € 100 is left for 25 researchers for four years. So before starting on a proposal, ask yourself the question: can I do research for € 1 per year?

The Sixth Framework Programme: http://europa.eu.int/comm/research/fp6/

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Photos by Floris Wiesman

BNVKI-Board News

Han La Poutré

Last year, we experienced the first BNAIS: the Belgium-Netherlands AI Symposium, intended for AI students and organised by AI students. This first BNAIS occurred in Utrecht, in March 2002. It appeared to be a great success, where a surprising lot of students from all over the Netherlands and Belgium were participating. We counted significantly more than 100 students, usually in their third or fourth year.

This year, a new BNAIS will be organised. The BNVKI Board invited the students from the UvA to organise this second BNAIS. It will thus be organised by the student association "VIA" of the UvA, on October 9th in Amsterdam. So, this is something to already announce in your classes... The students of VIA are currently very busy with the organisation, and already have a tentative list of speakers and demos ready. They have chosen as the topic of their symposium the issue of how far AI can and may go, including the ethical question of "playing God", as they call it.

We hope this years BNAIS will equal the success of the first one. Looking at the enthousiasm and energy by which it is currently organised, I personally do not doubt this...

Auditing Committee

Cees Witteveen

At each year's general assembly, which takes place at the BNAIC, an auditing committee is established to survey the BNVKI's financial records. At the BNAIC 2002 this did not happen because the survey over 2001 had not been approved yet. The Board of the BNVKI is now glad to propose as members of the auditing committee 2002 Gerda Janssens (KU Leuven) and Nico Roos (Universiteit Maastricht). BNVKI members who do not agree with this proposal are invited to contact the secretary of the BNVKI within three weeks after publication of this Newsletter.

Intriguing Inferences

Henk Visser
IKAT, Universiteit Maastricht

(*Math, Log and Comp decided to have regular discussions with each other. This time they are together in Math's room. Apparently Log wants to raise questions about types of inferences, a hitherto neglected subject*.)

LOG. Your favourite subject is intuitive inferences, Math, and I noticed that you also distinguish part whole inferences, but I haven't heard much about logical inferences. Do you consider them less important?

MATH. Not at all, Log. Yet they form only a subclass of inferences in mathematics.

LOG. What do you mean? I thought that mathematical proofs consist solely of logical deductions from axioms and theorems.

MATH. That is not my point. I am interested in problem solving procedures and that is a quite different matter. For me anything counts that contributes to a solution of a mathematical problem. So I distinguish not only deductive inferences, but also inductive, abductive and analogical inferences, because all these types of inference occur in mathematical problem solving. Mathematical problems, by the way, are not restricted to deductive problems, although adepts of Artificial Intelligence sometimes act as if all problems are state-space problems.

COMP. I know, but I have an excellent *Introduction to Artificial Intelligence* by Philip Jackson, who introduced the name 'system inference problems' for a type of problems that can certainly not be solved by logical reasoning alone. I understand that your other types of inference are used in these kinds of problems, but what is the connection?

MATH. Not too fast. The distinction between state-space and system inference problems is not exhaustive. There are also proof finding problems, problem making problems, and theory construction problems. And this makes the distinction between the types of inference that I mentioned only more significant.

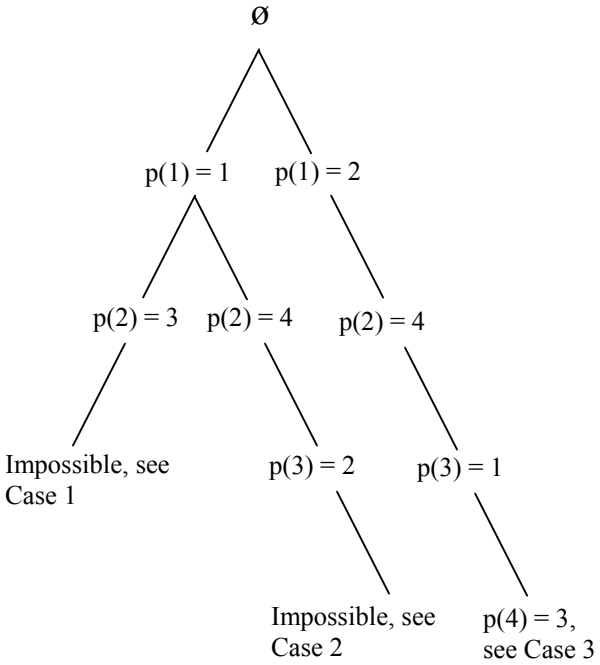
LOG. I would like to see examples.

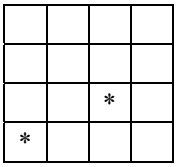
COMP. Please keep it simple, Math. Last time I had great difficulties to follow your juggling with polygonal numbers.

MATH. All right. I will give an example of an extremely simple state-space problem that will soon convince you that other than deductive inferences are needed. It is the old problem of the queens, or the problem of placing *n* queens on a board of *n* by *n* squares so that no one of them can take any other in a single move.

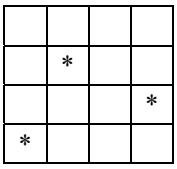
COMP. When I was a student, I met the eight queens problem in the introductory course in programming. The last chapter of our course book contained a page with all solutions for this special case of the *n* queens problem. Do you have a reason for posing the general problem? It seems to me that the eight queens problem is exemplary for the rest.

MATH. You may be right from the point of view of a computer scientist. But as a mathematician I want to solve all *n* queens problems at once, that is to say, I want a general solution. Therefore I do not even start with the eight queens problem, but with the four queens problem, however childish this may appear to you. I start with an empty board. Look! (*Math goes to his new whiteboard*) I am going to place the queens in the rows, beginning with the lowest one. Now, if the place of the first queen is in the first column, then the place of the second queen is either in the third column or in the fourth column. But if we put the second queen in the third column, then there is already no place left for the third queen. You see, this is a question of deductive inferences. If you don't mind I will draw the solution on the whiteboard:

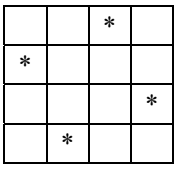




Case 1



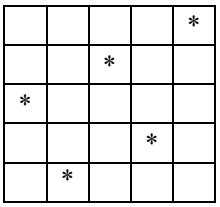
Case 2



Case 3

LOG. I am deeply impressed, Math. What are you up to?

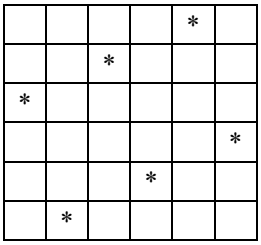
MATH. First of all, I hope that you see that we can easily derive a solution for the five queens problem from this solution. We need only to enlarge the board and put the fifth queen in the new corner:

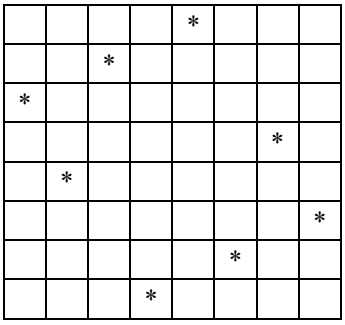


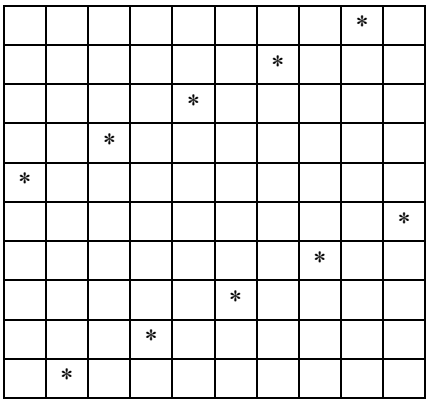
Secondly, I want to draw your attention to the fact that I gave only two possibilities to the first queen. We know that the other two amount to the same, because of the symmetry, but I am afraid that a computer would not discover this by itself. We human beings see this immediately and need no proof that each solution found in this way has a symmetrical counterpart. But this aside. Thirdly, I hope that you saw that the solution is also symmetrical: the upper half can be derived from the lower by a rotation. This suggests the idea that we should limit the solutions to regular ones, for example such as can be obtained by successive knight's moves in the lower part of the board. Now the first queen of our regular solution of the four queens problem stands in the second column. Can you form hypotheses about the corresponding place for the general problem?

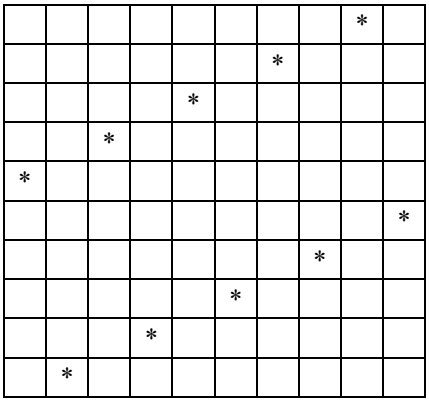
LOG. It is obvious that there are two simple hypotheses, p(1) = 2, and p(1) = ½*n*. Is that what you mean?

MATH. Yes, and my congratulations, for you have just drawn two inductive inferences. Let us try them one by one, restricting ourselves to even values of n, expecting that solutions for odd values of n can be derived in the indicated way. Well, I give you the results of the application of the hypotheses for the values 6, 8, and 10. (*Math draws the following four figures.*)









MATH. You see that the first hypothesis holds for $n = 6$, the second for $n = 8$, whereas both hypotheses hold for $n = 10$. What do you expect for $n = 12$?

COMP. The first hypothesis?

MATH. Yes indeed. And for $n = 14$?

COMP. The second hypothesis. And now you are certainly going to argue that both hypotheses hold for $n = 16$.

MATH. It is even worse. The first hypothesis holds for $n = 6, 12, 18$, and so on, that is for all values of the form $6m$, the second hypothesis for $n = 8, 14, 20$, and so on, so for all values of the form $6m + 2$, and both hypotheses for all values of the form $6m - 2$. If you do not believe me, you can try these solutions yourself for as many values as you want. But notice that the conclusions are due to an inductive inference. Isn't that a confirmation of my claim about the significance of other types of inference than deductive ones?

LOG. I assume that you already took the pains to prove that the inductive conclusions are correct.

MATH. Yes, I did prove it, but my proofs are too long to reproduce them here. I should like to confine myself to the remark that they required rather complicated algebraic operations and some elementary number theory. What is more important: the proofs did not come of themselves. That is characteristic of abductive inferences, as those inferences are called in which suitable premises are framed for given conclusions. I wonder whether students of Artificial Intelligence can offer alternative procedures that computers can perform.

COMP. There exist automated induction performances, but I doubt if abduction can already be automated.

LOG. Do you think that a computer program can get away with such formulas as – let me write them down (*she goes to the whiteboard*):

$f(4) = (2, 4, 1, 3)$
$f(6) = (2, 4, 6, 1, 3, 5)$
$f(8) = (4, 6, 8, 2, 7, 1, 3, 5)$
$f(10) = (2, 4, 6, 8, 10, 1, 3, 5, 7, 9)$ and
$f(10) = (5, 7, 9, 1, 3, 8, 10, 2, 4, 6)$

MATH. We mathematicians need only a few pictures in order to make good guesses. That does not cease to be amazing. How they sometimes succeed to solve proof finding problems is another

question. In my case, I started by formulating the general solutions for $n = 6m$ and so on, and finally I succeeded to get the proofs done, but it is too long ago for me to remember how I found them.

LOG. I can understand. But now I am anxious to hear what you have to tell about problem making problems.

MATH. My present example is the result of an analogical inference. You see that the knight's move is characteristic of the given regular solutions of the n queens problem. But can we also solve it without knight's moves, that is, in such a way that none of the queens is at a knight's move distance from any other queen? This is my new problem, but I admit that I have not yet worked on it.

LOG. How do you know that it has a solution at all?

MATH. Well, we can try to find a solution in a particular case, to begin with.

COMP. I can do the same, although I will consult my computer, so to say. After all, it will have no problem with finding a particular solution of such a simple state-space problem.

LOG. Let us see who comes first with a solution, assuming that there is one. I hope, of course, that there is no solution at all. Then we would have an interesting proof finding problem!

MATH. Nevertheless I will try. (*He takes pen and paper.*)

COMP. So shall I. (*He leaves the room.*)

LOG. I will look into some books of your library, Math, if you don't mind.

(*Already Math does not hear what Log is saying, so Log takes a book with a red cover from the shelf. After a while Math cries 'Yes' and at the same time Comp appears in the doorway. He is laughing and notices that Log is smiling when she looks away from her book.*)

LOG. I understand that both of you found a solution. So did I, but I found it in this book. Please show me your solution, Comp, and I ask you, Math, to draw your solution on the whiteboard. (*They do what she asks.*)

MATH. Here it is:

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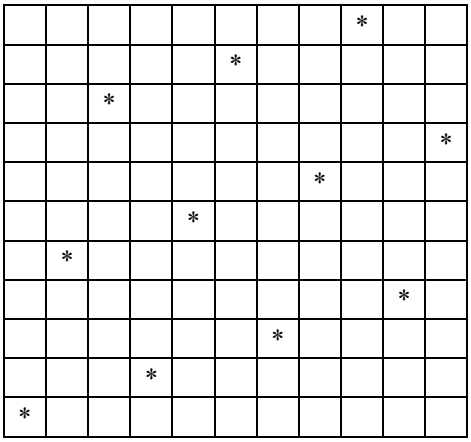
LOG. That is amazing! This is Comp's solution:

3, 6, 9, 1, 4, 7, 10, 2, 5, 8

MATH. Shall I tell you how I found my solution? It spontaneously occurred to me that I could possibly find a regular solution by taking a prolonged knight's move. I experimented first with an eight by eight board, but that did not work, so I turned to the ten queens problem. It was obvious that it made no sense to put the first queen in the left corner, for that would not give a regular solution with rotational symmetry. Therefore I tried $p(1) = 3$, deliberately skipping the second column, because I had the feeling that $p(1) = 2$ was reserved for regular solutions with the normal knight's move. I even had an association of the number three and the prolonged knight's move, which has also a three in it. To my astonishment I got the solution right on.

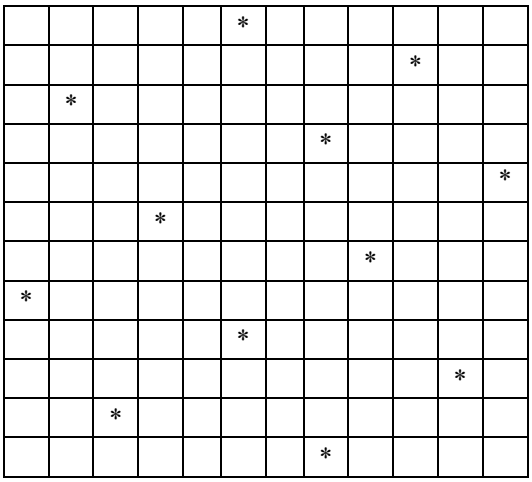
COMP. I found the solution after I had checked that the solutions of the eight queens problem in the introductory course book that I mentioned before did not contain a solution without a knight's move. Then I wrote a simple program for the ten queens problem and Log reproduced the first solution that it gave.

LOG. It seems to me that Comp's approach is not very different from Math's. Only Math used his famous intuition, so to say. But there is an element in his explanation that may be worthwhile to pursue further, especially when it comes to proving a general rule. Math said that he deliberately put the first queen in the third column. It looks as if this is the place of the second queen in an eleven queens problem. Look (*she adds a column and a row to the previous diagram*):

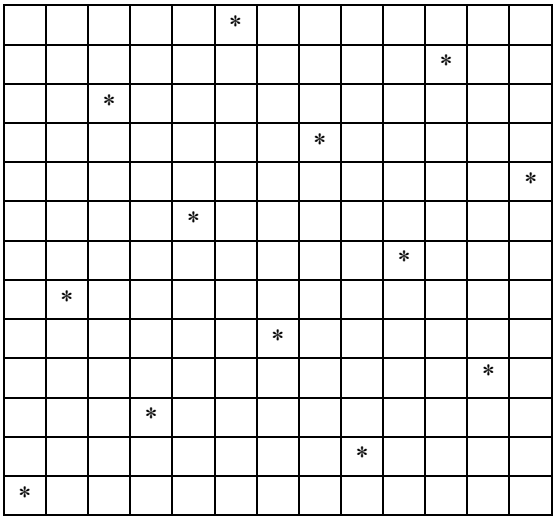


MATH. Wow! That looks promising!

LOG. I did not tell you that I also found a solution of Math's last problem in the book that I took, *Mathematical Recreations* by Maurice Kraitchik. Here it is (*she copies a part of Figure 126 of the book*):



COMP. It is obvious that this solution can be derived from a solution of the thirteen queens problem in the manner of what Log saw a moment ago:



LOG. This solution begins in the left corner below and repeatedly uses a translation 8 horizontal, 1 vertical. I would call it a periodical solution. It is not symmetrical, unlike the derived solution of the twelve queens problem.

MATH. I did not yet mention it, but I regard concept formation too as a type of inference that may be useful for solving theory construction problems. When we look at the regular solutions of the even queens problems, we see that they are all symmetrical, but only some of them are periodical. Those that are not can be derived from periodical solutions of odd queens problems. I think that this might be of great help, if we want a theory for regular solutions in general. I would suggest that we focus on periodical solutions, because they have an obvious connection with number theory. If that is correct, then we have to reverse our initial derivation of a solution of the five queens problem from a solution of the four queens problem. The former was periodical, but the latter was not.

COMP. Do you mean that we must start all over again? I am sorry, mathematical recreations are nice, but I have more to do.

LOG. So have I. See you, Math.

(*They leave Math behind in puzzlement*)

SIKS / IKAT Symposium: Brain, Language, and Artificial Intelligence

Report by Joyca Lacroix and Michel van Dartel
IKAT, Universiteit Maastricht

On June 13, the *Brain, Language, and Artificial Intelligence* symposium was held in Maastricht. IKAT organized the event in close cooperation with SIKS as a warm-up for the day's main event, the inaugural address of prof.dr. Eric Postma. The symposium was opened by prof.dr. Jaap van den Herik (Universiteit Maastricht) with a warm welcome to all participants.

THE IMPORTANCE OF ONTOLOGIES

The broad smile of the first speaker, prof.dr. Reind van de Riet (Vrije Universiteit Amsterdam), set the mood for the rest of the day. Van de Riet's presentation, appropriately entitled *SIKS LIKEs SP@CE*, consisted of an overview of things learned from two of his research projects, LIKE and SP@CE. LIKE, Linguistic Instruments for Knowledge Engineering, combined several

experimental findings from linguistics to eventually conclude: Ontologies can help in information systems design. SP@CE, the Security and Privacy in CyperspacE project, taught another lesson. In this project, several applications were designed to enhance security and privacy on the World Wide Web. These applications revealed that the ontologic rule is of importance to security and privacy on the web. Combining both conclusions leads to the general lesson that ontologies can help security and privacy in cyberspace. The participants decided that SIKS indeed LIKEd SP@CE, and rewarded van de Riet's efforts with a grand applause.

LEARNING AND FORGETTING

Next, prof.dr. Jaap Murre (Universiteit van Amsterdam) took the honors and introduced the audience to *A neurocognitive memory model: application to optimal learning of foreign languages*. Murre showed two problems in current approaches to the study of memory. The first concerns the fact that traditional memory models typically describe either the learning or forgetting process, but never both. The second involves the failure to find learning or forgetting functions that precisely fit results obtained from experimental studies. Subsequently, Murre presented a model that incorporates both learning and forgetting. The model stores representations according to decline and induction functions within and between memory stores. Data obtained from simulations with the model closely resemble experimental results. Murre explained that the model provides new insights in the underlying memory mechanisms operating on representations. This can be extremely useful, for example, when planning an optimal learning schedule for learning a foreign language.

THE STUDY OF TALKING BRAINS

After a short break in the Maastricht spring sun, the afternoon was resumed with the projection of a curiosity-evoking question on the screen: *How do brains talk?* This was the title of prof.dr. Patrick Hudson's (Universiteit Leiden) presentation. Hudson rephrased this question to: 'What brain mechanisms allow us to speak and hear, to talk and understand?' and explained that the focus of his talk was on how to study this research question. Three types of models of natural language processing were broadly discussed: linguistic, cognitive and computational models. Ingeniously, Hudson linked these three types of models to Marr's tri-level hypothesis of understanding information processes. He associated linguistic models with the computational level, cognitive models with the algorithmic level, and computational models with both the algorithmic and computational level. Hudson concluded that computational models allow us to understand what really goes on in the brain. By integrating two levels of understanding they provide the best explanatory adequacy.

Patrick Hudson.

ONTOLOGIES FOR THE WEB

Prof.dr. Frank van Harmelen (Vrije Universiteit Amsterdam) presented the current affairs regarding the semantic web in *OWL: an ontology language for the semantic web*. As van Harmelen explained,

Frank van Harmelen.

the main aim of development of a web ontology language (OWL) is to achieve machine accessible semantics. In fact, OWL is already out there, but by discussing the design goals of OWL van Harmelen showed that much research is yet to be done. Many industrial and academic institutions are involved in the development of OWL, and it attracts researchers from almost all disciplines of computer science. Van Harmelen closed with an open invitation to the audience to actively participate in the ongoing OWL research.

The symposium closed with a recapitulation of the presentations and some words of appreciation directed towards all speakers, attendants, and organizers by van den Herik. Already, it had been a day of pleasure, learning, and discussion, while the best was yet to come.

FUNDAMENTALS OF AI

After the closing comments, van den Herik kindly invited all participants of the symposium to attend the climax of the day: the inaugural address of Eric Postma. By reading his address titled *De onderste steen boven* he accepted the professorship of computer science in the Faculty of General Sciences of Universiteit Maastricht. Postma gave a compact overview of research in the field of Artificial Intelligence (AI) and showed how it is related to his own research, situated models of natural intelligence. He explained that, contrary to humans, computers perform relatively well at higher cognitive tasks such as reasoning and problem solving. However, the computer has a hard time performing more fundamental cognitive tasks, in which humans engage without much effort. Postma stated that at the basis of this inability to perform fundamental cognitive task lies the most prominent problem in AI: dealing effectively with the environment.

Inspired by the computational power of computers, traditional AI built systems capable of reasoning and problem solving at much higher levels than humans can. Unfortunately, it proves to be very hard to support these higher capabilities with a solid foundation. Postma made the catching comparison to a building that is impressive, but floats in the air because it lacks the bottom stones. In his research, Postma studies the fundaments of intelligence and intends to provide the floating top stones, placed by traditional AI, with a solid foundation.

The extreme good performance of natural systems on the 'onderste stenen' (fundamentals) of intelligence makes natural intelligence a good starting point for development of AI systems. Over years of research Postma has shown that biologically inspired AI-research proves very fruitful. Contrary to traditional AI systems, natural systems always operate in an environment. Postma considers this environment to play an essential role in the behaviour of natural intelligent systems. His research focuses on artificially intelligent systems that interact with a realistic environment through sensors and actuators. With examples from his research, Postma illustrated how he is building a decent fundament for AI's impressive building. After reading his address, Postma spoke words of special thanks to the people who inspired and supported him in his scientific career. The remainder of the day was dedicated to a festive celebration of his professorship.

CLOSING REMARKS

Both symposium and address showed work done, work in progress, and future aims of some of the AI community's prominent faces. It showed how fascinating and constantly challenging the field actually is. Besides being an inspiring day for all, it was most of all a day of pleasure and camaraderie between members of SIKS, IKAT, and the AI-community.

Presentations can be found at www.cs.unimaas.nl

Beyond the Borders

Jaap van den Herik
IKAT, Universiteit Maastricht

Science is international and not restricted by any national border. Analogously the contents of the Ph.D. theses listed below are not bound to the AI domain or the Databases/Information Systems research area. We see applications everywhere. The list below contains twelve Ph.D. thesis announcements. Some belong to the SIKS research school, but others deal with different topics, such as Mathematical Models for Reliable Data. Moreover we are pleased to announce two Belgian Ph.D. theses, one supervised by Maurice Bruynooghe and Jan Van den Bussche, the other by Danny De Schreye. An interesting observation is that the twelve Ph.D. theses listed will be defended within the time frame of one month only (from June 4 to July 4). Clearly, any generalisation from month to year does not apply, especially not if one recalls that over the last eight years the annual average harvest is below 30 theses.

Whatever the case, the Editorial Board of the BNVKI Newsletter welcomes the new doctores in the world of researchers that have passed an

important milestone in their career. Congratulations with your results. We wish you splendid summer holidays after the hard work of the last few months.

PH.D. THESES

J.L. Campos dos Santos (June 4, 2003). *A Biodiversity Information System in an Open Data/Metadatabase Architecture*. TU Twente. Promotor: Prof.dr. P.M.G. Apers.

M. Jansen (June 5, 2003). *Formal Explorations of Knowledge Intensive Tasks*. Universiteit van Amsterdam. Promotor: Prof.dr. B.J. Wielinga. Co-promotor: Dr. A.Th. Schreiber.

D. Tanase (June 5, 2003). *Magnetic-based navigation system for endovascular interventions.* TU Delft. Promotores: Prof.dr. P.J. French and Prof.dr. J.A. Reekers.

L.C. Breebaart (June 6, 2003). Rule-Based Compilation of Data-Parallel Programs. TU Delft. Promotor: Prof.dr.ir. H.J. Sips.

H.W. Nienhuys (June 18, 2003). *Cutting in deformable objects*. Universiteit Utrecht. Promotor: Prof.dr. M.H. Overmars. Co-promotor: Dr.ir. F. van der Stappen.

Y. Ran (June 18, 2003). *Repair Based Scheduling*. Universiteit Maastricht. Promotor: Prof.dr. H.J. van den Herik. Co-promotor: Dr.ir. N. Roos.

C. Bunea (June 20, 2003) *Mathematical Models for Reliability Data*. TU Delft. Promotores: Prof.dr. R.M. Cooke and Prof.dr. T.J. Bedford.

R.H. Klompé (June 23, 2003). *The alignment of operational ICT.* TU Delft. Promotor: Prof.dr.ir. M. Looijen.

M. Wegdam (June 26, 2003). *Dynamic Reconfiguration and Load Distribution in Component Middleware.* TU Twente. Promotor: Prof.dr.ir. L.J.M. Nieuwenhuis. Co-promotor: Dr.ir. M.J. van Sinderen.

R. Kosala (July 2, 2003). *Information Extraction by Tree Automata Inference.* KU Leuven. Promotores: Prof.dr. M. Bruynooghe and Prof.dr. J. Van den Bussche.

A. Serebrenik (July 2, 2003). *Termination Analysis of Logic Programs*. KU Leuven. Promotor: Prof.dr. D. De Schreye.

L.J. Kortmann (July 4, 2003). *The Resolution of Visually Guided Behaviour*. Universiteit Maastricht. Promotores: Prof.dr. H.J. van den Herik and Prof.dr. E.O. Postma.

As a continuation to the professorial appointments mentioned in the last two issues, we continue with new inaugural addresses to be announced as well as with informing our readership on an inaugural address already given. Unfortunately, the latter one escaped our attention in an earlier phase. Previously we announced the inaugural addresses by Van Harmelen, Postma, Hardman and Top (see the earlier issues of February and April 2003). Moreover we were pleased to congradulate with their appointments the following two professors: Cilia Witteman and Guus Schreiber. We look forward to receiving the announcement of their inaugural addresses.

Meanwhile we are happy to inform you on the inaugural addresses of three new members of the new generation of professors. They are Professor Sjaak Brinkkemper (VU), Professor Yao Tan (VU) and Professor René Bakker (OU). Since this issue of the BNVKI Newsletter is the June issue we reiterated two already announced inaugural addresses that take place in this month.

INAUGURAL ADDRESSES

Prof.dr. S. Brinkkemper (May 28, 2003). *Productsoftware - Essentieel onderzoek en onderwijs voor de kenniseconomie*. Vrije Universiteit Amsterdam.

Prof.dr. J.L. Top (June 13, 2003). *Food Informatics: Kokkerellen met Modellen*. Vrije Universiteit Amsterdam.

Prof.dr. E.O. Postma (June 13, 2003). *De Onderste Steen Boven*. Universiteit Maastricht.

Prof.dr. Y.H. Tan (June 26, 2003). *Makelaars in Vertrouwen. Instituties en procedures voor elektronische handel*. VU Amsterdam.

Prof.dr. R. Bakker (September 19, 2003). Open Universiteit Nederland (no title available).

SECTION KNOWLEDGE SYSTEMS IN LAW AND COMPUTER SCIENCE

Section Editor
Marie-Francine Moens

A3: A Knowledge-Based System in the Domain of Manure Tax Assessment

JURIX Lecture by Bauke Lyklema
Cap Gemini Ernst & Young
May 21, 2003
at the VU Amsterdam

Report by Carolus Grütters
Law & IT, KU Nijmegen

The idyllic image of a tobacco-chewing farmer biding his time is charming but deceptive. Farming, and cattle breeding in particular, is an extensive and elaborate business. Besides the breeding, feeding and looking after his animals, a cattle farmer has to manage his enterprise. In addition to the administration of his purchases and sales, there is one very specific item that has to be accounted for: the dung produced by his animals. In order to regulate the production, dumping and trading of manure and the protection of the environment, every cattle farmer has to administer in detail the composition and the quantity of the manure produced on his farm. Then, once a year, he has to pay an anti-pollution tax imposed by a special tax office of the Dutch Department of Agriculture.

AUTOMATIC TAX ASSESSMENT

Yearly this tax office has to determine the height of the levy of approximately 90.000 Dutch farmers. Until recently, a large staff did this by hand. With the development of a computer program (MINAS) this tax assessment is now - to a certain extent - automated. In his lecture Bauke Lyklama, senior consultant at CGE&Y, explained that, although the MINAS program facilitated a calculation of the levies, the tax office was interested in additional information for internal efficiency purposes as well as for external policy purposes. In order to meet these objectives, the MINAS program was extended with a knowledge-based module called 'A3' developed by CGE&Y.

THE BENEFITS OF KNOWLEDGE

The first (internal) objective of A3 can be explained in pointing at the fact that any levy is the result of a calculation based on hundreds of different entries, which have to be entered manually. Farmers as well as the tax office then easily can make a mistake in an early detection of omissions or errors may reduce handling time and therefore costs. Another aspect of the internal efficiency has to do with the large number of entries that are correlated with each other, implying that the answer to one question on the tax form restricts the answer to another. A3 facilitates this checking for completeness and consistency. Subsequently, it becomes possible to compare the data of a farmer over a number of years, indicating the probability of correctness of his tax assessment.

This latter option is linked to the second (external) policy purpose of A3, generating insight on certain economical developments of groups of farmers regionally or professionally arranged. It also provides information on the ability and willingness of farmers to implement in their daily management political objectives of environmental governmental policies. At the same time, it makes more explicit to the tax office what part of the data entries on the tax form is critical and subsequently, until what degree a certain loose interpretation of the rules is acceptable. In a wider perspective, A3 enables policy makers to reflect on the consequences of 'their' legislation or at least of its interpretation and implementation, not only in the light of tax revenues to be expected but also with respect to the size of the staff needed.

VERIFICATION AND VALIDATION?

Although Lyklema showed impressive listings of hierarchically organised rules used in A3, it remained unclear what method was followed as to verify the correctness, completeness and consistency of the rules in this knowledge base, even if refrained from the problems of maintenance. In the absence of any information on the validity, it was difficult to pass judgement on the A3 module, and the suggested option of using A3 as a policy analysis tool became a *non sequitur*. All things presented considered, adjusting a number of parameters in certain rules of the rule base may seem interesting for those involved in policy making simulating different outputs based on various scenarios, it is insufficient evidence that the A3 module is more than a well organised intriguing black box.

Software for the Legal Drafting Process

JURIX lecture by Rik De Busser
Katholieke Universiteit Leuven

May 21, 2003 at the Vrije Universiteit Amsterdam

Report by Bas van den Berg
Cognitieve Kunstmatige Intelligentie, Universiteit Utrecht

Rik De Busser argued that legal drafting systems have not become very popular yet, which is probably caused by insufficient cooperation between software experts and legal experts. The Netherlands is in comparison with Belgium more advanced in automating the legal process. The need for automating legal processes follows from the fact that since 1970 the amount of legislation in Belgium has been growing exponentially. With the growing amount of legislation, problems arise such as legal inflation, which means that legislation is getting more and more incoherent and it's getting more and more difficult to attain a consolidated version of legislation.

According to De Busser an important reason for legal inflation is a lack of uniformity in legislation, and a consequence is an increasing number of inconsistencies in legislation. Inconsistencies include: wrong references, inconsistent terminology, logical inconsistencies, and normative logical inconsistencies. Logical and normative logical inconsistencies differ from the other inconsistencies in the sense that sometimes the legislator intentionally includes them to anticipate unexpected situations or because the legislator has to make a concession.

De Busser observed a poor compliance with legal drafting manuals, which caused a lack of uniformity in legislation and insufficiently clear and readable legislation. De Busser also observed the problem of human error in the legal drafting process, which also caused a lack of uniformity. Research showed that boring and repetitive work was a major reason for human error. The lack of uniformity in legislation causes problems in the electronic processing of legal documents.

INFORMING PROGRAMS

De Busser identifies three different types of legal drafting systems: informing programs, text generation and assembling programs, and validation programs. Informing programs do not interfere with the legal drafting process. They can be static or dynamic. Static informal programs are mostly help documents (e.g., LexEdit – Istituto per la documentazione giuridica, Italy; SOLON - Katholieke Universiteit Leuven). Dynamic informing programs provide context sensitive help (e.g., DocuPlanner – University of Wyoming, USA). LEDA (Universiteit Tilburg) is a system based on Word macros that provides a checklist for the legal drafting process.

TEXT ASSEMBLING PROGRAMS

Text assembling programs assist in drafting new legislation. SOLON is a text assembling program that provides a template for legislation. SOLON is also implemented as Word macros. Text generation programs contain knowledge about the structure of legislation, which consists mainly of grammatical knowledge and knowledge about rhetorical relations. Text generation programs assist the user in generating new legislation or modifying existing legislation. One example of such a program is DocuPlanner. Another example is EnAct (Royal Melbourne Institute of Technology, Australia), which also has the capability to generate metadata and hyperlinks.

An explanation for the lack of popularity of drafting programs is the reluctance of legal experts to use them or promote them, because these systems may harm their unique competences in the legal drafting process. Another argument for not using these systems is that legal experts have enough skills to perform the legal drafting process manually, which is more efficient than using a legal drafting system. The biggest gain of legal drafting systems can be achieved by automating the more routine legal drafting processes.

The surface structure of a concept refers to the different representations that correspond with the same concept. The goal of legal drafting should be to reduce the variation in surface structure in legislation. This can be achieved by following a formal process, which is commanded by a legal drafting system. However a reason for not reducing the surface structure is the need to explain legislation, which requires different surface structures for the same concept.

VALIDATION SYSTEMS

The last type of legal drafting systems regards validation systems. These systems execute after the user has completed a legal document. The result of the validation process can consist of a list of wrong formulations or missing formal properties. Formal properties include: page numbering, punctuation, etc. EnAct, Solon, Lexedit and E-POWER are validation programs, which validate the formal

properties. Only EnAct and E-POWER (Universiteit van Amsterdam) are able to validate a document on metadata, hyperlinks and a document type definition (DTD). A DTD sums up the necessary and permitted components of a legal document. Programs that can validate the spelling and grammar of a document are LEDA and Lexedit. LawClerk (University of Liverpool, UK) is an example of a program that can identify logical and normative logical inconsistencies.

Currently only Enact and Lexedit are actively used. Other systems are still under development. Many systems are developed in an exotic programming environment, have insufficient separation between the execution program and the domain knowledge, have an ill-considered architecture, or have a poor integration of the system into the business process. De Busser concludes that EnAct is the only exception to the discussed problems.

PLANS FOR THE FUTURE

Future research will focus on a comparison with technical documentation systems. Technical documentation seems similar to legislation with respect to size and complexity: when all the documentation of Boeing airplanes would be stacked, it would create a pile of 38 kilometers, apart from the microfilms. De Busser concluded his talk by emphasizing the need for digitizing legislation and using uniform standards, because of the size and the increasing amount of resources needed to maintain legislation. A nice first step is that there are plans circulating in the Flemish government, which encompass the complete redesign and standardization of the Flemish legislation using XML markup. However the realization of these plans depends on how the political situation is going to evolve in the Flemish and the Belgian federal government. (for more information see: www.law.kuleuven.ac.be/icri/liir.php)

JURIX 2002

Report by Marie-Francine Moens
Interdisciplinair Centrum voor Recht & Informatica, KU Leuven

The fifteenth JURIX conference was held December 16-17, 2002 at the Institute of advanced Legal Studies, London, UK. The invited speaker was Richard Susskind OBE, Gresham Professor of Law and IT Advisor to the Lord Chief of Justice of England. His book, *Expert Systems in Law*, published in 1987 was a pioneering work. There were fifteen very interesting papers presented at this conference. We give here a short overview.

Alexander Boer, Rinke Hoekstra and Radboud Winkels (Universiteit van Amsterdam) presented *^{META}Lex: Legislation in XML*, an open XML standard for markup of legal documents. The standard provides a generic and easily extensible framework for the XML encoding of the structure and contents of legal and paralegal documents. It differs from existing metadata schemes in two respects: It is language and jurisdiction independent and it aims to accommodate uses of XML beyond search and presentation services.

José Saias and Paolo Quaresma spoke about *Semantic Enrichment of a Web Legal Information Retrieval System* (Universidade de Evora, Portugal). They developed a methodology to enrich legal documents with semantic information using the output of partial parsers and an appropriate semantic ontology. An inference engine based on the declarative programming language Prolog is used as the basis of the reasoning process. In this way semantic information is extracted from the documents and inferences can be made with this information in a retrieval system.

In the paper *For the Automated Mark-Up of Italian Legislative Texts in XML* Andrea Bolioli, Luca Dini, Pietro Mercatali and Francesco Romano (CELI, ITTIG, CNR, Italy) present a method for mining information within legal texts, more specifically legislation. Text mining or information extraction can provide a valuable help to people involved in research about the linguistic structure of statutes, and, as a side effect, can be the seed for a new generation of applications for the validation and conversion in the legislative domain.

Jan Odelstad and Lars Lindahl (Gävle University, Lund University, Sweden) discussed *The Role of Connections as Minimal Norms in Normative Systems*. Their aim is to develop an algebraic representation of normative systems by sets of minimal norms, “connections” within relation structures called condition implication structures. It is shown that, given some presuppositions, a normative system is completely determined by its set of connections, and that comparisons between normative systems can be made by considering whether connections in one system are narrower or wider than in another. The general study for the framework is Boolean algebra and a relational structure called Boolean quasi-ordering.

Declarative Power, Representation, and Mandate: A Formal Analysis by Jonathan Gelati, Guido

Governatori, Antonini Rotolo and Giovanni Sartor (University of Bologna, Italy, The University of Queensland Brisbane, Australia) provides a formal framework for developing the idea of normative co-ordination. This idea is based on the assumption that agents can achieve flexible co-ordination by conferring normative positions to other agents. These positions include duties, permissions and powers.

In *A Path of Discontinuity: The TAXIS Case as a Transition from e-Government to e-Regulation*, Prodomos Tsiavos, Steve Smithson and Spyros Kotyvos (London School of Economics, UK) study the development and evolution of the Greek Tax Information System (TAXIS). Focusing on the characteristics of e-government and e-regulation they identify the links between these two forms of e-governance as complex and multi-layered forms of control. By employing regulation and infrastructure theories they examine the implementation of TAXIS. Consequently they conclude that the side-effects and patchwork may be desirable when new regulatory forms are to be introduced.

Tom van Engers, Liesbeth van Driel and Margherita Boekenoogen (Belastingsdienst Utrecht) presented a paper on *The Effect of Formal Representation Formats on the Quality of Legal Decision-Making*. In the Program for an Ontology-based Working environment for Rules and legislation (POWER) the Dutch Tax and Customs Administration developed a formal modelling approach for modelling legal sources. In the paper the authors compare two different knowledge representations and tested their learnability and usability. Furthermore, they examined the effect of representation on legal decision-making. The two representation-forms used are production rules and scenarios.

Joost Breuker, Abdullatif Elhag, Emil Petkov and Radboud Winkels (Universiteit van Amsterdam) discussed in *Ontologies for Legal Information Serving and Knowledge Management* the nature and use of various ontologies for the information management of documents of criminal trial hearing. The work is part of the e-court European IST project. The ontologies are to be used (1) in tagging and annotating hearing documents and (2) in searching these documents and structuring the set of retrieved documents. The technology used to represent these ontologies is based on the emerging standards of the Semantic Web.

Marie-Francine Moens (Katholieke Universiteit Leuven, Belgium) presents in *What Information Retrieval Can Learn from Case-Based Reasoning* an overview of the problems of information retrieval systems that search court decisions. Several solutions and new research directions are suggested. The solutions are inspired by the technologies of current case-based reasoning systems and support the use of question answering and query by example for the retrieval of information.

In *Incomplete Arguments in Legal Discourse: a Case Study* Henri Prakken (Universiteit Utrecht) investigates to what extent natural-language arguments in legal discourse can be regarded as containing incomplete arguments. In a study of a Dutch civil dispute it was found that many seemingly incomplete arguments can plausibly be regarded as containing an unstated premise, especially statutory rules, legal classification rules, and empirical commonsense generalisations. However, several other such arguments were found to be seemingly incomplete, since they can be regarded as based on the defeasible argumentation schemes of temporal persistence and appeal to witness testimony.

Trevor Bench-Capon (The University of Liverpool, UK) spoke about *Representation of Case Law as an Argumentation Framework*. Since their introduction by Dung, Argumentation Frameworks have provided a fruitful basis for studying reasoning in defeasible contexts, including law. As yet, however, no realistic body of case law has been represented as an Argumentation Framework. Bench-Capon discussed an Argumentation Framework of a much discussed body of case law, and drew attention to a number of questions concerning approaches to reasoning with cases in AI and Law.

Filipe Borges, Raoul Borges and Danièle Bourcier (Université de Paris, France) presented a paper on *A Connectionist Model to Justify the Reasoning of the Judge.* One of the main obstacles to the use of Artificial Neural Networks (ANN) in the legal domain comes from their inability to justify their reasoning. The authors propose an algorithm of justification applied to the connectionist prototypes (Multilayer Perceptron) implemented at the Court of Appeal of Versailles.

In *The Use of Legal-Knowledge-Based Systems in Public Administration: What Can Go Wrong?* Hugo de Bruin, Henry Prakken en Jörgen Svensson explored the functioning of practical applications of legal-knowledge based systems. The authors investigate to what extent incorrect decisions may be caused by factors that cannot be attributed to flaws in the program's knowledge base or reasoning. The study is illustrated with a case study

of a knowledge base system in use in a Dutch municipality.

Antoinette J. Muntjewerff (Universiteit van Amsterdam) presented *Principled and Structured Design of Electronic Materials for Learning the Law*. Electronic legal education involves the use of information, communication and instructional technologies to enhance students learning of the law and to provide law teachers with environments and tools for teaching the law. The paper presented defines the construction of electronic materials for learning the law and defines the research agenda.

Finally, Michael C. Bromby and Maria Jean J. Hall discussed the *Development and Rapid Evaluation of the Knowledge Model to ADVOKATE: an Advisory System to ASSES the credibility of Eyewitness Testimony* (Glasgow Caledonian University, UK and La Trobe University Bundoora, Australia). Advocate is a web-enabled knowledge base application operating in the forensic and legal domain, offering assistance to police and legal counsel in their task of assessing the credibility of potential witnesses. Directed graph techniques are used to model rule based knowledge and discretionary decisions and argumentation are modelled using a technique derived from Toulmin argumentation. The knowledge was acquired from legal cases, published legal and psychological research and interviews with domain experts.

The full papers are published in T. Bench-Capon, A. Daskalopulu and R. Winkels (Eds.), *Legal Knowledge and Information Systems (Frontiers in Artificial Intelligence and Applications* 89). Amsterdam: IOS Press.

In conjunction with the conference, two workshops were held: The Second Workshop on Law and Education Technologies and a workshop on e-Government.

JURIX 2003
Sixteenth Annual International Conference on Legal Knowledge and Information Systems

December 11-12, 2003, Utrecht

FIRST CALL FOR PAPERS, TUTORIALS AND WORKSHOPS

Papers are invited on research on artificial intelligence and information technology as applied to the law, and in particular on legal knowledge systems and legal changes. Typical topics are:

- Systems that support legal decision making, drafting, knowledge discovery, negotiating and teaching
- Knowledge acquisition for legal knowledge systems
- Data mining for legal applications
- Legal ontologies and semantic web
- Representation of normative knowledge and open structured knowledge
- Interfaces and retrieval systems of legal information
- Question answering systems for legal databases
- Legal neural networks and rule based systems
- Verification and validation of legal knowledge systems
- E-government, e-court, e-democracy
- Digital rights management and legal intelligent agents
- Legal technology assessment and practical uses
- Models of legal reasoning and argumentation
- Theoretical foundations and models in Artificial Intelligence and Law

But papers on other relevant topics are welcome.

IMPORTANT DATES

Submission of paper: September 15, 2003
Notification of acceptance: October 5, 2003
Final paper: October 19, 2003

Papers should not exceed 5000 words. Electronic submission of papers is strongly preferred. To submit electronically, send the paper to the Program Chair as an email attachment, using PDF, PostScript or Word format. If electronic submission is impossible, to submit by ordinary mail, send 4 copies of the paper to the Program Chair. Style sheets can be obtained from the conference website.

Finally, proposals for tutorials and workshops are invited. Please submit a short description of the topic plus CVs of the organisers. Workshop proposals should be received before September 1, 2003; tutorial proposals (with the schedule) before September 15, 2003. All proposals should be sent to the program chair, preferably by email (see above).

The conference proceedings will be published by IOS Press (Amsterdam, Berlin, Oxford, Tokyo, Washington DC) in their series *Frontiers in Artificial Intelligence and Applications* before the Conference.

PROGRAM CHAIR

Danièle Bourcier
CERSA-CNRS
Université de Paris 2
10, rue Thénard
F- 75005 Paris
Email: bourcier@msh-paris.fr

PROGRAM COMMITTEE

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ORGANIZATION COMMITTEE

Henry Prakken, Tina Smith (Universiteit Utrecht)
Tom van Engers (Dutch Tax and Customs Agency)

Conference information can be obtained from:
www.cs.uu.nl/jurix03/

JURIX Legal Knowledge Based Systems Biennial Price

From 2003 onwards *JURIX Legal Knowledge Based Systems* will grant a biennial price of € 500 for the best Master thesis in the domain of legal informatics. A first price will be granted in December 2003 at the *Sixteenth Annual International Conference on Legal Knowledge and Information Systems,* at the Universiteit Utrecht.

REQUIREMENTS AND LIMITATIONS

- The Master thesis is successfully defended at a Dutch or Flemish university in 2001-2003.
- The Master thesis is written in Dutch or English.
- The subject of the Master thesis is in the domain of legal informatics.

Typical subjects are:

- Systems that assist legal reasoning and decision making (e.g., knowledge based or decision support systems, tools that assist in arbitration, negotiation and argumentation)
- Representation of legal knowledge and world knowledge, legal ontologies, knowledge representation in norm based systems
- Models of legal reasoning and argumentation (e.g., logics, case based reasoning)
- Automated reasoning with different and/or uncertain sources (e.g., tools that support the compiling and comparing of evidence)
- Systems that support the drafting of legal documents (e.g., legislation, contracts), the use of document standards, tools for the verification of the quality of legal language
- Use of XML for the drafting of legal documents, information retrieval and knowledge based systems
- Legal databases and their retrieval (e.g., searching text, question answering systems, search engines on the World Wide Web)
- Automated knowledge extraction and data mining from legal texts and legal data
- Applications of machine learning to law
- Intelligent legal tutorial systems
- Intelligent agents in the legal domain
- Evaluation, verification and validation of legal information systems
- E-government, e-court, e-democracy

IMPORTANT DATA

15/09/2003	Submission of the curriculum vitae of the candidate, title and abstract (maximum 500 words) of the Master thesis
30/09/2003	Notification of acceptability of the Master thesis
15/10/2003	Submission of the Master thesis
15/11/2003	Notification of the decision of the jury
11/12/2003	Presentation of the award at the Sixteenth Annual International Conference on Legal Knowledge and Information Systems, Universiteit Utrecht.

The jury is composed of researchers of Dutch or Flemish universities who are specialized in legal informatics.

Correspondence should be addressed to Prof.dr. Marie-Francine Moens, KU Leuven, Belgium, e-mail: marie-france.moens@law.kuleuven.ac.be.

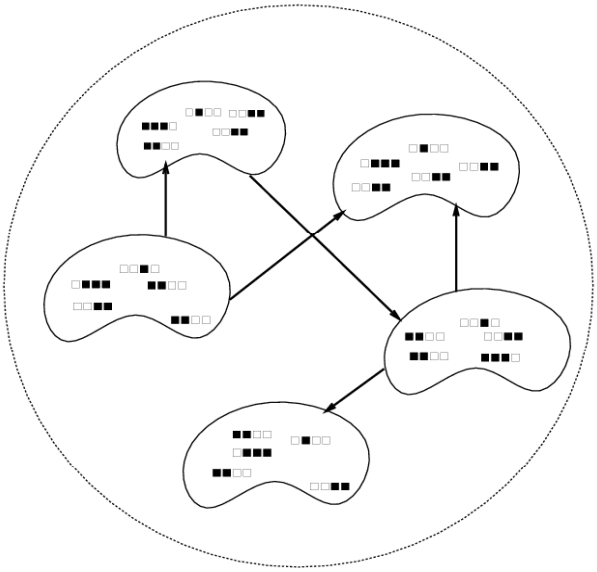
AI EDUCATION

Section Editor
Evert van de Vrie

Coarse-Grained Parallel Genetic Algorithms

Mario van den Bogaard
Open Universiteit Nederland

Parallel genetic algorithms (PGAs) are enhancements of traditional genetic algorithms. They implement the concurrent evolution of individuals or populations. Concurrency is achieved by running independent genetic algorithms on several processors. A way to classify PGAs is by means of their grain: fine grained PGAs aim at parallelizing the evolution of individuals and coarse grained PGAs consist of multiple concurrently evolving subpopulations that evolve independently from each other. My thesis describes the design and development of a PGA environment called



Migrations between Subpopulations.

PGAlib, a flexible C++ library for implementing coarse grained PGAs. *PGAlib* is based on *GAlib* (Genetic Algorithms library, developed at the Massachusetts Institute of Technology) and makes use of MPI (Message passing Interface) as communication library.

There are numerous reasons to parallelize Genetic Algorithms. One obvious reason is speed. Another, perhaps more important reason, is that PGAs lead to better solutions because of a broader exploration or exploitation of the search space. Besides these technological reasons, the thesis also mentions the possibility of using PGAs as a tool to model biological experiments.

An application based on *PGAlib* consists of a set of evolving subpopulations that periodically exchange individuals among them. See the figure for a schematic representation of this principle. The subpopulations in the figure are represented by the "clouds" encircling individuals. The individuals in this example are represented as bit-strings, with the colours black and white denoting different bit values. Individuals in the subpopulations are copied and moved to other subpopulations from time to time. This exchange is called a *migration cycle* and the way this migration is done is called the *migration strategy*. The strategy characterizes the particular parallel implementation. The arrows represent a migration snapshot between the subpopulations. Along the arrows, individuals can move from one population to another. The subpopulations undergo exactly the same genetic operations on the same kind of genotype and the result is the best individual found in the overall population.

PGAlib forms the foundation to specify these migration strategies. Three strategies have been predefined and investigated in the thesis:

- The Island strategy: Local subpopulations interact with arbitrary subpopulations.
- The Neighbourhood strategy: Subpopulations only interact with nearby subpopulations. In order to define a distance measure, the subpopulations are placed on a grid.
- The Farming strategy: The best individuals are gathered and redistributed.

These migration strategies are benchmarked and evaluated on performance and on their solution finding capabilities using the DeJong functions, a set of functions for performance comparisons of evolutionary algorithms. These migrations strategies have also been compared with each other, a feature that is absent in other PGA implementations.

The experiments lead to the general conclusion that the Island migration strategy is the most efficient for an optimisation problem when taking into account both solution finding and time-performance issues. The Farming method seems to be able to speed up finding the solutions of some hill climbing problems where one optimum exists (for example DeJong function 3), but has a tendency to converge too soon in a local optimum

in problems that need broad exploration. The Farming method also gets time-consuming if the number of processes or number of migrators increases. On all aspects the Neighbourhood strategy resides in between the other methods.

The work described in this thesis was done in order to obtain a Master's degree in Computer Science at the Open Universiteit Nederland. The work was performed as part of the Ph.D. research "evolution of populations in dynamic environments" of Anthony Liekens (daily supervisor) at the department of Biomedical Imaging and Modelling of the faculty Biomedische Technologie of the Technische Universiteit Eindhoven. The supervisor at the TUE was prof.dr. .P.A.J. Hilbers and the supervisor at the OU was dr.ir. S.E. de Vos.

M.Sc. Theses in Section AI Education

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

Section Editor
Richard Starmans

SIKS Masterclass on Communication Modeling

June 30, 2003, Tilburg

This Master Class is especially aimed at Ph.D. students of the research school SIKS and also open to others. The objective of this one-day intensive course is to give an advanced introduction into communication modeling and communication engineering.

The last decade we have seen that the integration or coupling of systems has become more and more important, e.g., based on EAI technology or XML-based messaging systems. What does this mean from a business perspective? Central to this day is the Language/Action Perspective that focuses on what people *do* when communicating. Originally introduced by Winograd and Flores in the eighties, this perspective has made a broad impact on research in Information Systems (e.g. workflow management), CSCW and AI (e.g. agent communication).

PROGRAM

10.20-10.30	Opening by dr. Hans Weigand, Universiteit Tilburg.
10.30-11.30	Prof. Jan Dietz, TU Delft. *The atoms and molecules of communication; the DEMO modeling perspective*
11.30-12.30	Prof. James Taylor, University of Montreal. *Organizational Communication*
12.30-13.45	Lunch
13.45-15.00	Dr. Jeff Conklin, Cognexus Institute. *State of the Art on Research and Practice in Issue-Based Information Systems*
15.15-16.15	Prof. Goran Goldkuhl, Linköpings universitet. *Communication modeling; a workpractice perspective*

ORGANIZER

Dr. Hans Weigand, Universiteit Tilburg, H.Weigand@uvt.nl, tel. + 31 13 4662806.

REGISTRATION

Please register in advance with Alice Kloosterhuis, alice@uvt.nl, tel. + 31 13 4663020. Attendance (including lunch) is free for SIKS Ph.D. students, for SIKS members, and people attending the LAP 2003 Conference. For others, the fee is € 20 (including lunch).

LOCATION

Universiteit Tilburg, Room B701 (main building, 7th floor).

More information can be found on the website: http://www.uvt.nl/infolab/info/events/lap2003/siks_mc.html

Workshop on the Future of Neural Networks (FUNN 2003)

July 5, 2003, Eindhoven

The workshop is organized in cooperation with the Dutch Research school for information and

knowledge systems (SIKS) and is part of the advanced components stage of SIKS' educational program for Ph.D. students. Therefore, they are strongly encouraged ro participate.

This workshop will take place on July 5, 2003, TU Eindhoven, the Netherlands and is affiliated to ICALP 2003, June 30 - July 4, 2003

More information can be found on the website: http://www.cwi.nl/~sbohte/funn/funn.html

SCOPE AND TOPICS

Neural Networks are inspired by the highly interconnected neural structures in the brain and the nervous system. In the last twenty years the field has become popular and many of the neural networks have found their way into practical applications.

On the more foundational level, there has been quite some recent development in the field. It is even to such an extent, that researchers that have not been in touch with the field for some years, have the feeling that it has completely changed. Some examples of developments:

- The introduction of more biological plausible neural networks, liked spiking neural networks.
- The combination of several networks, possibly combined with other formalisms, into ensembles that can yield a better performance than networks in isolation.
- The emergence of unifying frameworks for different types of networks, like the Support Vector Machines.
- The integration with statistics, most noticeably in the shift towards graphical formalisms like Belief Networks.
- The spin-off of successful new areas like Independent Component Analysis.

WORKSHOP PROGRAM

10:15 Opening by Joost Kok

10:30 Invited talk
A Modern View on Artificial Intelligence-Can computers think? Bert Kappen, KU Nijmegen.

11.45 *Automated Theory Building* by virtual scientists Olcay Kursun, Oleg Favorov, Orlando.

12.15 Lunch break

13:30 *On Artificial Spiking Neural Networks.* Sander Bohte, CWI Amsterdam.

14:00 *A Pulsed Neural Network model of Spatiotemporal Receptive Fields and population coding in auditory cortex*. Marcus Volkmer, Hamburg-Harburg.

14:30 *Emergence of filters from natural scenes in a sparse spike-coding scheme*. Laurent Perrinet, Manuel Samuelides and Simon Thorpe, Toulouse

15:00 Break

15:15 *Dynamic Retention in Recurrent Networks of Spiking Neurons*. Emmanuel Dauce, Université de Méditerranée, Marseille

15:45 *Exploring Temporal Memory of LSTM and Spiking Circuits*. Arne Koopman, Matthijs van Leeuwen and Jilles Vreeken, Universiteit Utrecht.

16:15 Break/drinks/discussion

LOCATION

The workshop will be held at the "auditorium" builing of the TU Eindhoven. Travel directions and a campus map can be found at http://www.win.tue.nl/icalp2003/Travel.html

REGISTRATION FOR SIKS PH.D. STUDENTS

Participation is free for SIKS Ph.D. students. However, there is a limited number of places at the workshop. Applications to participate will be honoured in a first-come first-serve manner. SIKS Ph.D. students should not contact the local organisation, but send an e-mail to *office@siks.nl* and inform Mrs. Sofie Broos that they want to participate. Please, inform her about your dietary needs.

REGISTRATION FOR OTHER GROUPS

Registration can be done on-site or via the conference web-site:
http://www.win.tue.nl/icalp2003/
On-site registration fee is 100 euro, the website late registration fee is 75 euro.

WORKSHOP ORGANIZERS

Sander Bohte, CWI Amsterdam
Michiel van Wezel, Erasmus Universiteit Rotterdam
Joost Kok, Universiteit Leiden
Erkki Oja, Helsinki University of Technology

CONTACT

For more information, please contact Sander Bohte (sbohte@cwi.nl) or Michiel van Wezel (mvanwezel@few.eur.nl).

IRIS / SIKS Symposium

July 25, 2003, Nijmegen

On Friday July 25, 2003 the Information Retrieval and Information Systems (IRIS) group of the KU Nijmegen organizes in cooperation with SIKS the following event:

Hidden Assumptions in Language and Communication: Implications for Information Systems and Information System Development.

PROGRAM

13.45 Arrival and Coffee
14.00 Andy Hilgartner: *Hidden Semantic Assumptions and Science*

15.15 Stijn Hoppenbrouwers: *Language and Communication in Information System Development*
16.00 Coffee
16.10 Discussion (introduced and chaired by Gert Veldhuijzen van Zanten): hidden assumptions in language and communication; implications for information systems and information system development
17.00 Drinks

REGISTRATION

For registration, please contact: stijnh@cs.kun.nl

GENERAL TOPIC

We set out to explore and reflect on the topic of language, meaning, and communication, in relation to information systems development processes, and inherently also to the products of such processes: information systems. We focus primarily on language used in human-to-human communication, but cannot possibly ignore the fact that principles and concepts underlying "natural language" are extended to many language-like forms of conceptual representation. These include mathematical languages, languages for conceptual modelling, and programming languages (the three of which are of course related).

ANDY HILGARTNER

Andy Hilgartner (USA) has been active in the field of General Semantics for over fifty years. He is inspired by what he calls the "survival crisis" of the human race, and relates this crisis to our world view as engrained in our language. Building on work by Korzybski, Sapir, and Whorf (among others), he has addressed the validity of some basic, implicit assumptions underlying the grammar and concepts of the Western Indo-European languages, and the scientific languages derived thereof. In particular, he follows Korzybski in rejecting the "identity" relation (a=a). Andy has been exploring alternative ways to linguisticly express what we want to say about the world we live in, and has devised a rudimentary formal notation (a "derived grammar") in this vein. In addition, he has performed initial explorations in applying this notation to fields like theoretical biology, social theory, biochemistry, and physics. His ideas have proved to be of considerable interest in view of general systems theory.

STIJN HOPPENBROUWERS

Stijn Hoppenbrouwers graduated in English and Linguistics in 1994, and has since specialised in the language-oriented study of information systems and information systems development. He has adopted a radically functional view on language, rooted in Functional Linguistics (for example Functional Grammar: Dik, 1989; Weigand 1989) and the Language Action Perspective (Winograd and Flores, 1986). He has recently submitted his PhD thesis, called *Freezing Language: Conceptualisation Processes across ICT-Supported Organisations*.

SYSTEM DEVELOPMENT AS A RATIONAL COMMUNICATIVE PROCESS

Working in the IRIS group of the "Nijmeegs Instituut voor Informatica en Informatiekunde", Stijn applies his ideas to information systems architecture and development. He is particularly interested in how people communicate about language (in particular, about words and terms) and align it for use in information systems and information systems development.

However, this interest should be seen in context of the general communication that for a large part constitutes the information systems development process. The IRIS group (including Erik Proper and Gert Veldhuijzen van Zanten) is currently investigating ways of dealing with the many implicit assumptions involved in this process, how

they can be made explicit, and how this can improve the rationality of system development.

Seminar Simulation in Economics

September 17, 2003, Rotterdam

On Wednesday September 17, 2003 the research group Modeling and Simulation of the Erasmus Universiteit will organize a one-day seminar "Simulation in Economics" under auspices of research school SIKS. The event is one of the first activities of the recently founded SIKS working group on "Information Science and Economics"

A brief description of the seminar topics and a provisionary program can be found at: http://www.few.eur.nl/few/research/eurfew21/m&s/seminar/index.htm

Participation is free for all SIKS members.
Registration: to be announced soon.

ANNOUNCEMENTS

Thirteenth Dutch-Belgian Conference on Machine Learning

January 8 and 9, 2004, Brussels

BENELEARN is the annual machine learning conference for researchers in Belgium and the Netherlands. It serves as a forum to exchange ideas and present recent work. BENELEARN will be organized by the Computational Modeling Lab (COMO) located at the Vrije Universiteit Brussel (VUB) and the department of Industrial Science and Technology (IWT) at the Erasmus Hogeschool Brussel (EHB). The official language for this conference is English.

BENELEARN invites relevant papers from Machine Learning domains, disciplines which are closely related and papers that cross borders between them. Possible paper topics include (but are not limited to):

- Applications of machine learning
- Bayesian learning
- Support vector machines
- Case-based learning
- Computational learning theory
- Data Mining
- Evolutionary computation
- Hybrid learning systems
- Graphical models
- Inductive learning
- Scientific discovery
- Statistical learning theory
- Language learning
- Learning by analogy
- Learning in multi-agent systems
- Learning by imitation
- Learning classifier systems
- Multi-strategy learning
- Neural networks
- Reinforcement learning
- Robot learning

Papers are limited to 8 pages (11pt Times Roman), including figures, references and appendices. Style files can be downloaded from the conference website. All submitted papers will be reviewed in terms of their relevance to the conference and their clarity or overall understandability for a general Machine Learning audience.

Electronic submissions in postscript or PDF to: benelearn-submissions@como.vub.ac.be.

IMPORTANT DATES

Deadline submissions: October 3, 2003
Notifications: November 7, 2003
Final copy: December 5, 2003
Conference: January 8 and 9, 2004

ORGANISING COMMITTEE

Bernard Manderick, Ann Nowé and Kris Steenhaut

For further information: send an email to benelearn@como.vub.ac.be or visit the website: http://benelearn04.vub.ac.be/

IAS-8: 8th Conference on Intelligent Autonomous Systems

March 10-13, 2004, Amsterdam

IAS-8 brings the Intelligent Autonomous Systems Conference back to Amsterdam, the city which also hosted the first two IAS conferences. The focus of these conferences is on intelligent systems that can directly sense and act in their own environment without demanding detailed supervision from humans. These systems are beginning to enter our daily life in ambient intelligence applications. Many new challenges are emerging to create

systems that can operate and interact in human inhabited environments.

SUBMISSION INFORMATION

Prospective authors are invited to submit full papers in PDF or Postscript formats through the conference website www.ias8.org. Accepted papers must be presented at the conference by one of the authors in order to appear in the conference proceedings and CD. The proceedings will be published by IOS press and will be available as book and CD-ROM.

IMPORTANT DATES

Submission of extended abstract: September 8, 2003
Acceptance notification: November 17, 2003
Final paper due: December 15, 2003
Early registration: December 15, 2003

TOPICS

Topics include but are not limited to: Autonomous robots, Robot vision, Domestic robots, Multi-agent systems, Sociable systems, Distributed decision making, Cooperative multi-robots, Human and robot skills Humanoids, Service robotics, Health care and medical robots, Biologically inspired systems, Sensing and data fusion, Planning and control architectures, Learning and adaptive systems, Robot societies, Robots in space and underwater, Human-robot interaction, Cognitive robotics

General chair:
Frans Groen, Universiteit van Amsterdam

Local organization:
Ben Kröse, Universiteit van Amsterdam

For more information: www.ias8.org

CONFERENCES, SYMPOSIA WORKSHOPS

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

JULY 1-2, 2003
The 8th International Working Conference on the Language-Action Perspective on Communication Modelling (LAP 2003). Tilburg, The Netherlands.
http://www.uvt.nl/lap2003

JULY 10-12, 2003
Smart Adaptive Agent Applications (SA3). Joint ALAD and EUNITE Workshop at the EUNITE 2003 conference. Oulu, Finland.
http://www.eunite.org/eunite/events/eunite2003/eunite2003.htm

JULY 14-17, 2003
3rd International Symposium on Imprecise Probabilities and Their Applications (ISIP TA '03). Lugano, Switzerland.
http://www.sipta.org/~isipta03

JULY 21-25, 2003
11th International Conference on Conceptual Structures (ICCS 2003). Dresden, Germany.

AUGUST 9-15, 2003
18th International Joint Conference on AI (IJCAI '03). Acapulco, Mexico.
http://www.ijcai-03.org/

AUGUST 18-29, 2003
The Student Session of the 15th European Summer School in Logic, Language and Information (ESSLLI-2003). Vienna, Austria.
http://www.science.uva.nl/~bcate/esslli03

AUGUST 24-27, 2003
9th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining. Washington DC, USA
http://www.acm.org/sigkdd/kdd2003/

SEPTEMBER 3-5, 2003
Joint Conference on Declarative Programming (APPIA-GULP-PRODE 2003). Reggio Calabria, Italy
http://www.informatica.ing.unirc.it/agp03

SEPTEMBER 3-5, 2003
7th International Conference on Knowledge-Based Intelligent Information & Engineering Systems (KES'2003). Oxford, United Kingdom.
http://www.brighton.ac.uk/kes/kes2003/

SEPTEMBER 4-6, 2003
DiaBruck 2003. The seventh workshop on the Sematics and Pragmatics of Dialogue (SEMDIAL). Saarland University, Germany.
http://www.coli.uni-sb.de/diabruck/

SEPTEMBER 7-8, 2003
Semantic Web and Databases (colocated with VLDB 2003). Berlin, Germany.
http://www.cs.uic.edu/~ifc/SWDB/

ADDRESSES
BOARD MEMBERS BNVKI

Prof.dr.ir. J.A. La Poutré (chair)
Centrum voor Wiskunde en Informatica
P.O. Box 94079
1090 GB Amsterdam
Tel.: + 31 20 592 9333. E-mail: Han.La.Poutre@cwi.nl

Dr. R. Verbrugge (secretary)
Rijksuniversiteit Groningen, Cognitive Science and Engineering
Grote Kruisstraat 2/1, 9712 TS Groningen.
Tel.: + 31 50 3636334. E-mail: rineke@tcw2.ppsw.rug.nl

Dr. C. Witteveen (treasurer)
TU Delft, ITS
P.O. Box 5031, 2600 GA Delft
Tel.: + 31 15 2782521. Email: c.witteveen@its.tudelft.nl

Dr. A. van den Bosch
Universiteit van Tilburg, Taal- en Literatuurwetenschap
Postbus 90153, 5000 LE Tilburg
Tel.: + 31 13 4668260. E-mail: Antal.vdnBosch@kub.nl

Prof.dr. M. Denecker
Katholieke Universiteit Leuven
Dept. of Computer Science, Celestijnenlaan 200A
3001 Heverlee, België
Tel.: + 32 16327544. E-mail: marcd@cs.kuleuven.ac.be

Dr. C. Jonker
Vrije Universiteit Amsterdam, Dept. of Artificial Intelligence
De Boelelaan 1081, 1081 HV Amsterdam
Tel.: + 31 20 4447743. E-mail: Jonker@cs.vu.nl

Dr. F. Wiesman
Universiteit Maastricht, IKAT
Postbus 616, 6200 MD Maastricht
Tel.: + 31 43 3883379. E-mail: Wiesman@cs.unimaas.nl

Drs. B. Zinsmeister
Cap Gemini Ernst & Young
Postbus 2575
3500 GN Utrecht
Tel.: + 31 30 6893394. E-mail: Bas.Zinsmeister@cgey.nl

EDITORS BNVKI NEWSLETTER

Dr. F. Wiesman (editor in chief) -See addresses Board Members

Prof.dr. E.O. Postma
Universiteit Maastricht, IKAT
Postbus 616, 6200 MD Maastricht
Tel: + 31 43 3883493. E-mail: postma@cs.unimaas.nl

Prof. dr. H.J. van den Herik
Universiteit Maastricht, IKAT
Postbus 616, 6200 MD Maastricht
Tel.: + 31 43 3883485. E-mail: herik@cs.unimaas.nl

Dr. E.D. de Jong
Universiteit Utrecht, Inst. for Information & Computing Science
P.O. Box 80089, 3508 TB Utrecht
Tel.: + 31 30 . E-mail: dejong@cs.uu.nl

Dr. M.F. Moens (section editor)
KU Leuven, Interdisciplinair Centrum voor Recht & Informatica
Tiensestraat 41, 3000 Leuven, België
Tel.: + 32 16 325383
E-mail: marie-france.moens@law.kuleuven.ac.be

Dr. J. van Looveren (editor Belgium)
Vrije Universiteit Brussel, AI Lab
Pleinlaan 2, 1050 Brussel, Belgium
Tel.: + 32 6293702. E-mail: joris@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
Postbus 2960
6401 DL Heerlen
Tel: + 31 45 5762366. Email: Evert.vandeVrie@ou.nl

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COPY

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Editorial Office BNVKI/AIABN Newsletter
Universiteit Maastricht, Hazel den Hoed,
Dept. Computer Science, P.O. Box 616, 6200 MD
Maastricht, The Netherlands
E-mail: newsletter@cs.unimaas.nl
http://www.cs.unimaas.nl/~bnvki/