

IJLC

Magazine

5

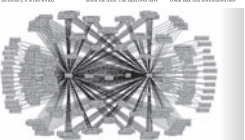
March 2003



Language and Inference Technology Group analyzes Dutch election campaign

Dear Veronique, Jaap Kamps and Michael Manach were interviewed by Rosalind Brewster about a pilot project in which they analyzed political documents on the internet. More on this project can be found on <http://www.sciencenews.nl/~kamps/lingcomp/>.

What do you do?
Jaap: "We are working on a project in the 'natural language processing' area. We are interested in how computers can understand human language. We are currently working on a project in which we analyze political documents on the internet. This is a very interesting area because it involves a lot of natural language processing. We have a lot of data and we are trying to find out what the computers can do with it. We are also interested in how we can use this data to improve the way we communicate with computers. This is a very challenging task because it involves a lot of complex algorithms and a lot of data. We are also interested in how we can use this data to improve the way we communicate with computers. This is a very challenging task because it involves a lot of complex algorithms and a lot of data."



In this issue amongst others:

The LIT group analyzes Dutch election campaign

The photo collection of Peter van Emde Boas

'Logic meets Psychology', interview with Michiel van Lambalgen

The photo collection of Peter van Emde Boas

The village of Heerlen is home to the mathematician and computer scientist Peter van Emde Boas (PvE) and his friends, or perhaps more appropriately, colleagues and friends. PvE's collection of photographs, PvE's reputation as 'the man with the camera', extends far beyond his circle of colleagues and friends.

As with most computer and mathematics people, PvE started the digital camera, organizing and collecting photos. He has a large collection of photos, many of which are of his colleagues and friends. He is also interested in how we can use this data to improve the way we communicate with computers. This is a very challenging task because it involves a lot of complex algorithms and a lot of data.

Source: <http://www.sciencenews.nl/~kamps/lingcomp/>



Interview with Michiel van Lambalgen 'Logic meets Psychology'

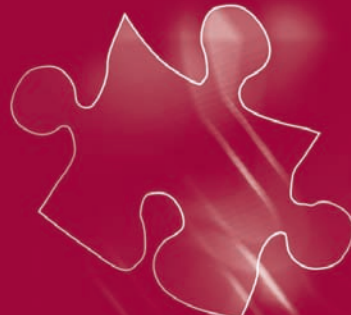
Michiel van Lambalgen did his Master's degree in philosophy at Amsterdam and in 1987 he received his PhD with a dissertation entitled 'Random Sequences'. After that he worked for a year as a lecturer in probability and statistics at the Dutch University of Technology. From 1988 until 1993 he was a Heisenberg fellow of NWO. In 1994 he became the principal investigator in the NWO Pioneer project 'Reasoning with Uncertainty' at WINS, at the University of Groningen. After this project ended in 1995, he worked as an assistant professor in logic and AI. In 2002 he became a professor in logic and cognitive sciences.



Together with Frank Veltman he is the project leader of the NWO Pioneer project 'Logic meets Psychology: Reasoning with Uncertainty', which employs three PhD students.

How did the work in your department start to evolve? I started in 1987 with a PhD in philosophy. I was interested in logic and probability. I was also interested in how we can use this data to improve the way we communicate with computers. This is a very challenging task because it involves a lot of complex algorithms and a lot of data. We are also interested in how we can use this data to improve the way we communicate with computers. This is a very challenging task because it involves a lot of complex algorithms and a lot of data.

of papers in the field of logic and probability. I was also interested in how we can use this data to improve the way we communicate with computers. This is a very challenging task because it involves a lot of complex algorithms and a lot of data. We are also interested in how we can use this data to improve the way we communicate with computers. This is a very challenging task because it involves a lot of complex algorithms and a lot of data.



Announcements

Staff February 2002 - February 2003

The following persons left the ILLC last year:

- Elsbeth Brouwer left us in March 2002. She continues to work on her dissertation.
- Sjoerd Zwart left in April 2002. He is now with the Department of Philosophy of the Delft University of Technology.
- Gertjan van der Hoeven left in June 2002.
- Herman Hendriks left the ILLC in September 2002. He is now with the University of Utrecht.
- Yuri Engelhardt graduated on 13 September 2002.
- Wim van Dam graduated on 9 October 2002. He is currently with the Mathematical Sciences Research Institute at Berkeley, USA.
- Also Jan van Eijck left us at the end of October, because his work as the scientific director of the OzsL ended. He is of course still working with CWI as a senior researcher and with the University of Utrecht as professor of Computational Linguistics at Uil-OTS.
- Menno van Zaanen left us in November 2002. He is now with the ILK / Computational Linguistics, at the Tilburg University.
- Rosella Gennari graduated on 2 December 2002.
- Gabriel Musillo left us on the first day of 2003 to work with LATL, Department of Linguistics, University of Geneva, Switzerland.
- Carlos Areces is now with INRIA Lorraine, at Nancy, France.

Luckily we could welcome, besides the new PhD-students, a good number of new staff members.

- Wim van Hage, scientific programmer as of 1 February 2002.
- Reinhard Blutner, assistant-professor as of 1 March 2002.
- Stefan Schlobach, postdoc as of 1 March 2002.

- Nanning Poelsma, scientific programmer as of 1 March 2002.
- Tanja Kassenaar, administrative officer as of 16 March 2002.
- Peter Paul de Witte, programme manager of the Master of Logic Programme as of 16 April 2002.
- Vera Hollink, scientific programmer as of 1 September 2002.
- Massimo Franceschet, postdoc as of 1 October 2002.
- Karin Müller, postdoc as of 1 January 2003.
- Detlef Prescher, postdoc as of 1 January 2003.

And there are as always some people who just changed jobs or titles within the ILLC.

- For starters Ingrid van Loon, who used to be Programme manager of the Master of Logic Programme, is, as of 1 April 2002, our new manager.
- Ivar Vermeulen graduated on 6 February 2003, but is postdoc as of 1 September 2002.
- Eva Hoogland stopped her work for the OzsL at the end of October 2002. But she'll still be working with Johan van Benthem a couple of hours a week.
- And Khalil Sima'an used to be a KNAW fellow, but as of 1 February 2003 he is assistant-professor.

Prizes and Awards

Maarten de Rijke: one postdoc and one scientific programmer for a three year period on a project on "Model Checking Methods and Tools for Hybrid Logics (HyMoC)" (NWO Sciences)

Pieter Adriaans: € 500,000.- on a project on "Adaptive Information Disclosure", part of the "Virtual Lab project" of the Informatics Institute (national ICES-KIS funds)

Martin Stokhof, Jeroen Groenendijk, Michiel van Lambalgen, Remco Schaen Frank Veltman: € 272,800.- for two PhD students on a project on "Prolegomena to a Future Semantics" (het Centraal Onderzoeksfonds, the University of Amsterdam)

Johan van Benthem has been invited to become a member of the Royal Holland Society of Sciences and Humanities in Haarlem, the Netherlands.

Events

NASSLLI-2003, 2nd North American Summer School in Logic, Language, and Information, Bloomington, Indiana, 17-21 June 2003, <http://www.indiana.edu/~nasslli/>

ESSLLI 2003, 15th European Summer School in Logic, Language and Information, Vienna, Austria, 18-29 August 2003, <http://www.logic.at/esslli03/> (or <http://www.esslli.org>)

5th International Tbilisi Symposium on Language, Logic and Computation, Tbilisi, Georgia, 6-10 October 2003, <http://www.illc.uva.nl/Tbilisi/>

Dutch Information Retrieval Workshop, Amsterdam, the Netherlands, October 2003, further details are not yet available. As soon as there is more information you will find it through <http://lit.science.uva.nl/>

14th Amsterdam Colloquium, Amsterdam, the Netherlands, 19-21 December 2003, further details are not yet available. As soon as there is more information you will find it through <http://www.illc.uva.nl/>

CONTENTS

<i>Announcements</i>	2
<i>Language and Inference Technology Group analyzes Dutch election campaign</i>	3
<i>The photo collection of Peter van Emde Boas</i>	5
<i>Esslli's Little Sister</i>	8
<i>Interview with Michiel van Lambalgen 'Logic Meets Psychology'</i>	10
<i>The Moderate Effectiveness of being Human Peter van Emde Boas</i>	13
<i>New PhD students</i>	15
<i>Alumna door alumnus</i>	16

COLOPHON

ILLC Magazine is published by:
Institute for Logic, Language and Computation
Universiteit van Amsterdam
Plantage Muidergracht 24
1018 TV Amsterdam
The Netherlands

Tel: +31 (20) 525 6051
Fax: +31 (20) 525 5206
E-mail: illc@wins.uva.nl
WWW: <http://www.illc.uva.nl/>

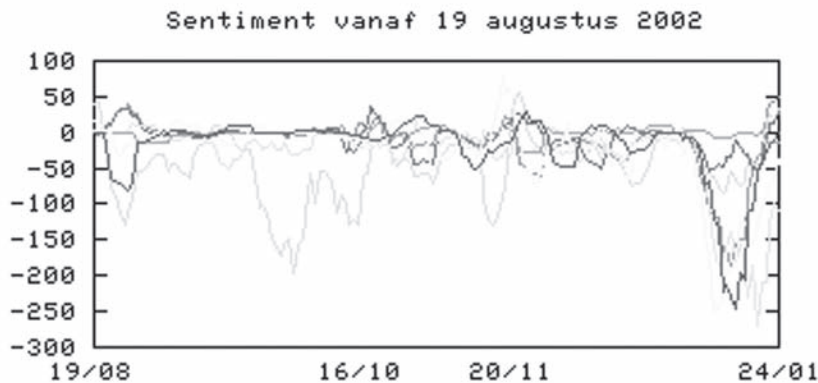
EDITORIAL TEAM:
Maarten Marx, Marie Nilssenová

DESIGN:
Crasborn Grafisch Ontwerpers bno,
Valkenburg a.d. Geul

PRINTING:
Drukkerij Hub. Tonnaer, Kelpen

PHOTOGRAPHY:
a.o. Jeroen Bruggeman, Balder ten Cate, Peter van Emde Boas, Maarten Marx





account when calculating ‘the mood’ for, in this case, stocks. At first we would just look for adjectives with a simple kind of thesaurus, an amateur WordNet sort of. Then Jaap suggested to use WordNet, which allows for much more complex relations.”

What do you do with it now?

Jaap: “In a pilot project we are now using WordNet to look for sentiments in texts. We first analysed English political discussions around the UK parliamentary elections in 2001. Later on, after the elections in the Netherlands, we did the same with Dutch political discussion on the internet after we translated the words into Dutch. There are only 5000 words, ranking from a positive to a negative sentiment, so you can pick the odd translations out very easily. We just had it running analysing internet discussions on politics since last August. Then our cabinet fell and you could suddenly see very interesting and credible patterns in the sentiment and the intensity.

This little project we had running on the side is now growing bigger, there is a lot of interesting things happening. Rob Mokken has been a driving force throughout the project for us and luckily Maarten de Rijke is always very encouraging, otherwise this would not have come this far.”

What will be the future for your project?

Jaap: “We are trying to obtain funding from NWO to continue this project on a larger scale, focusing on a scientific approach to evaluation and further development. Unfortunately, it is always a struggle to get funding for research of a multi-disciplinary nature.”

Ivar: “This is really the kind of research of which people assume exists for decades, while in fact there is still very little of it. It is very much applied research, the use for it is evident. On a dedicated page on the website of the national daily ‘NRC Handelsblad’ I show the results of what is talked about in internet discussions and explain it. The statement in that same newspaper a month earlier claiming it is

impossible to take internet discussions into account in politics is now already falsified. You can see what people are talking about and in which way without wading through thousands of postings every day. It even gives an extremely fast, near instant, insight in the current sentiments, without polling, surveys or any of the existing instruments. The data is spontaneously supplied by the people, without them even being aware of it. Instead of asking specific questions in a telephone survey or a panel, you just take a look at what the people come up with themselves on a topic you choose.

Jaap: “We should take the lead in it now. The computing power you need for it is readily available today, as well as the data. The texts in a digital format on the internet we use now are growing daily without us doing anything for it. It is right there on the internet, waiting for us to tap into. This prototype seems to work and it is exciting to find out for sure. To be able to ask more complicated questions that go further this needs to be transformed in a new, though less applied perhaps, research design.”

Reinder Rustema

Reinder Rustema is teaching about internet culture and the history of the internet at Mediamatic, Amsterdam. reinder@rustema.nl

Newsgroups: nl.politiek
 Subject: **Re: Dom gelul van Femke mbt (hard)drugs.**
 From: Marc W <m1917@hotmail.com>
 Date: Fri, 27 Dec 2002 15:10:58 +0100
 X-Newsreader: Microsoft Outlook Express 5.50.4522.1200

"B55" <B55@etc.nl>

>> "Ik ben er niet tegen en verbieden is helemaal verkeerd,
 >> maar ik ben niet voor legaliseren".....

> Ze is een hele goede politica en integer en een verrijking voor de
 > politiek. Wat nou infantiel?!

Weet je ik heb nog steeds geen flauw idee over welke uitspraak dit gaat,
 maar er niet voor zijn iets te verbieden maar het ook niet legaliseren, dat
 lijkt me toch vrij raar.

The photo collection of Peter van Emde Boas



The village of Heemstede is home to the mathematician and computer scientist *Peter van Emde Boas (PvEB)* and his famous, or perhaps more appropriately, infamous collection of photographs. PvEB's reputation as 'the man with the camera' extends far beyond his circle of colleagues and friends.

As with so many scientists and faculty members, PvEB attends the usual meetings, congresses, and Ph.D. defenses. However, in contrast to just about everyone else, PvEB does so armed with a camera, and with the explicit intent of photographing his colleagues. What is it that drives this man to shoot over a hundred films a year? Why can he not resist the urge to capture the academic wildlife on film?

"My private photo collection, containing the usual family events, goes back to 1970. The work-related collection however, took off at the end of August 1976. I had organized a meeting at the Mathematical Center, then situated in the 2e Boerhaavestraat, and I decided to capture the speakers and the public on film. I can't recall what my exact motive was at the time, maybe I did not have one, but

as it was to my and others' liking, I have kept on recording these kind of events ever since. And the longer I did it, the keener I became about keeping the collection complete and up-to-date."

"I take my camera to all professional events that I am involved in. What does 'involved' mean here? In my opinion, it is my moral obligation to attend every event that concerns the faculty and so to learn about whatever it is that my esteemed colleagues are busy with. I don't attend just for the sake of the collection; the photos themselves are not the driving force. So no, I never ask others to take pictures if I can't attend personally. However, when I do attend, I am keen on taking the pictures, and this is not always easy. Mathematicians have the unpleasant tendency to grab a piece of chalk at the beginning of their lecture, then

Renate Bartsch at the Montague Colloquium, February 14, 1977





Johan van Benthem's promotion, February 2, 1977

turn to the blackboard, so all you see for the rest of the presentation is the back of their head. The other day I attended a workshop in Logic and Games and a French lecturer managed to either stare at his notes, look at the blackboard, or hide behind his long hair that continuously covered his face. I'd think he might use a hairpin, but he probably didn't find that appropriate, being male. But I had a hard time concentrating on his lecture, ceaselessly thinking: please, just for one moment, assume a pose that I can photograph."

"Some 12 years ago I substituted as chairman at a Ph.D. defense for Professor Herzberger who unexpectedly wasn't able to attend the ceremony himself. I had planned to witness the ceremony as part of the cortege but was appointed the chairmanship on the spot. Herzberger, extremely busy at that time, was so pleased with the idea of a stand-in, that he asked me to replace him again the following day. Since then I have chaired close to 90% of the Ph.D. defenses of Mathematics and Computer Science, and these are almost all represented in my collection. Since 1986 I have also been chairman of the exam committee of Computer Science, so approximately 80 to 90% of the Master's exams are also represented in my collection. Every

person who gives a lecture, every person attending my office or house for more or less professional reasons is bound to end up on one of my pictures."

"Whether this extensive collection has any use? I'll just give some examples. When Hendrik Lenstra officially left the faculty in December 1990, my collection proved extensive enough to fill two whole albums just with pictures featuring him on professional occasions. Likewise, when Johan van Benthem turned 50, we presented an overview of pictures of him, partly based on family pictures, partly based on my collection. Like all the others who have been in front of my camera over the past decades, one could see him turn from a youngster into a respectable gent. At the departure of Anne Troelstra, I was again asked to embellish the display case that was set up for him with pictures. And when I was photo-editor for the European Association for Theoretical Computer Science bulletin for a period of ten years, the collection again proved useful. In fact, when 'George Polya's picture album - encounters of a mathematician' was composed, I was approached for a picture of Professor N.G. De Bruijn. So, yes, the collection has proven its use."

"However, at present the collection has yet to be indexed properly; dates are the only way to find your way through it. I hope to index it one day, but for now there is this considerable backlog of close to ten years to get rid off first. In my will, I arranged to leave the whole collection to het Wiskundig Genootschap (Dutch Mathematical Association), and I hope to find the time to work through it with the archivist to reduce it to the 'scientific core'. And I hope we will be able to annotate the photos correctly. The pictures are now filed in chronological order, and I have saved all kinds of announcements and programs hoping these will help me to connect the right occasion and name with the right face. But cases of misidentifications have happened before, and there's a good chance more will follow."

Following this explanation of its origins, it was time to actually take a look at the collection. Is it really as overwhelming as one would expect given that it is based on 'a hundred films a year since 1976'?

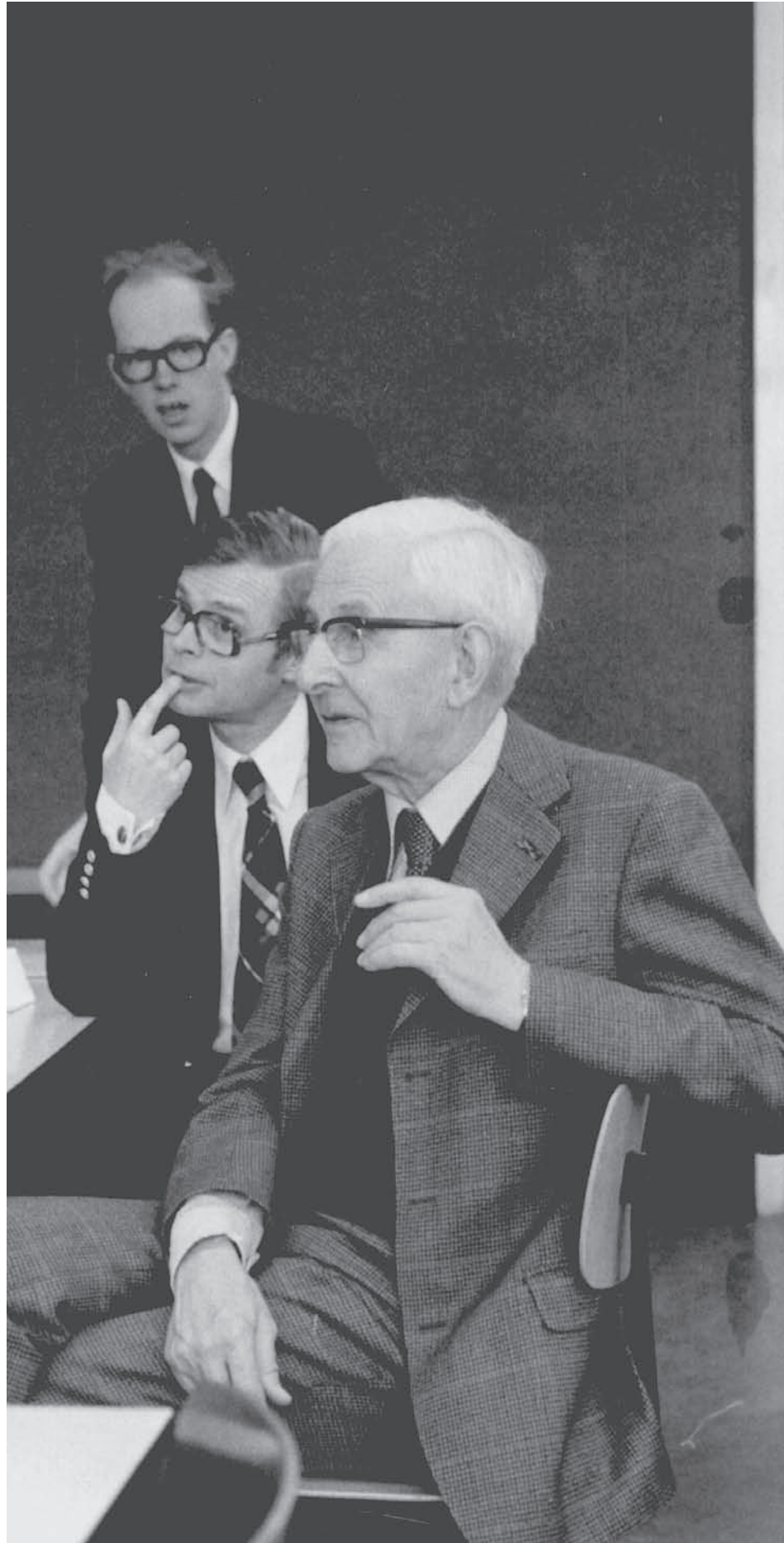
First PvEB shows the part of the collection that has already been categorized. Approximately 5 meters of heavy A4 ring binders occupy the lower shelf of the bookcase in the living room. PvEB removes the first album (1976) with

snapshots of professional gatherings from the shelf and opens it. A wealth of yellowed color pictures from the late seventies appears. The photos depict people with beards, heavy rimmed glasses, bell-bottoms and the occasional leather jacket. People behind lecterns, in front of blackboards, listening, talking, explaining, enjoying a break in between sessions, attending dinners. Meanwhile PvEB tosses off names, like he's grinding out his ABC's. Color and black-and-white photos alternate. Formal ceremonies follow less official gatherings with little children crawling around on the floor.

Then PvEB insists on giving some impressions of the backlog that he mentioned. He opens some drawers, which are filled from corner to corner, bottom to top with files containing pictures. Sure, it will take some time to sort these out, but with some good spirit and the right morale, it seems quite feasible. But it quickly emerges that this backlog is only a leftover of the real backlog that is stocked in a room upstairs. On entering this room, the real extent of the backlog becomes clear. Here, on a table, are hundreds of files each containing approximately thirty pictures. Clearly, sorting this out will require a little more than some good spirit and the right morale. However baffling, PvEB blithely wanders around, seemingly oblivious to the enormous, ever-expanding amount of work that this collection will require. He points at the small stacks of announcements, programs, and invitations that are supposed to provide the key to future categorization and annotation of the photos. Let's just hope there is a God to help the man or woman who will be burdened with composing 'Peter van Emde Boas's picture album - encounters of a computer scientist'...

Sophie van der Sluis
SvdSluis@writersblock.net,
sophie@educ.uva.nl

Arend Heyting at a Mathematics
 Colloquium, February 2, 1977



Essli's Little Sister

Doubtlessly, many readers of this magazine will have participated, as a lecturer or as a student, in one of the annual European Summer Schools on Logic, Language and Information. This year is already the 15th anniversary of ESSLLI, and the ever-growing success of the summer school is evidenced by the launch of a North-American analogue. The First North-American Summer school in Logic Language and Information took place June 24-30, 2002 at Stanford University. Darko Sarenac, one of the organizers of the first NASSLLI, calls it a sister-event of ESSLLI.



Sarenac: "Several of us visited various ESSLLIs and we all had one feeling in common: we were impressed with the high level of fruitful interaction among European scholars and students as well as the strong sense of intellectual community in the areas relevant to LLI. We thought that it may be intellectually advantageous to attempt something similar here in North America."

Compared to its European sister, NASSLLI had the atmosphere of a somewhat smaller, more intimate summer school, with about 120 participants. The school lasted one week, but these 7 days were fully exploited, since the academic program was completely packed with courses, workshops and evening lectures. From Monday to Friday, lectures and workshops took place from 8.30 - 17.30 (three

NASSLLI



parallel tracks). On Saturday, there was a student session (two parallel tracks), two workshops (one on mathematical logic, and one on modality) and the San Francisco gay parade to attend. Finally, on Sunday there was a cognition workshop. On top of that, there were five evening lectures! The quality of the courses was high. Among my personal favorites were Samson Abramski's course on linear logic and game semantics, the course by Larry Moss and Alexandru Baltag on dynamic epistemic logic and Craig Boutilier's course on Markov decision processes. Of the evening lectures, Sol and Anita Feferman's stories about the life of Alfred Tarski were very delightful.

Obviously, the schedule didn't leave much time for sightseeing. Luckily, I had some extra days to spend before and after the summer school, and the friend who I was staying with (who was living in Silicon Valley, around the corner from a well-known internet search engine) was able to show us around San Francisco with his convertible - whenever he got it to work. We learned to eat garlic fries during SF Giants vs. Oakland Athletics and fried garlic at a restaurant called Stinking rose. We spent some very enjoyable evenings at the local bar called Rose & Crown (a popular place among NASSLLI participants), in Alexandru Baltag's apartment watching the World Cup finals, or just lying in a park enjoying the California weather...

NASSLLI'02 was largely organized by students. This raises the question how a group of students could manage to so successfully organize such a big event. Darko explains: "We were in fact rather lucky to have a group of students who were not only extremely dedicated, but also had the relevant experience. In particular, I want to mention

Audrey Yap, who literally held the organization of the school together. She contributed in more ways than I could justifiably mention here. Also, Patrick Scotto di Luzio and Kim Thompson were invaluable in organizing the finances, and last but certainly not the least, Prof. van Benthem transferred some of the valuable Old World expertise to us. In addition the North American LLI community has proved to be very enthusiastic about having the school on this continent."

The birth of a child is usually greeted with some reservations by the older sister. Some people have half-jokingly posed the question whether NASSLLI should be considered a threat for 'our' European summer school. Will potential ESSLLI students or lecturers decide to go to NASSLLI instead? American students or scholars might consider a summer school closer to home more convenient, and European students or researchers might consider participating in a summer school in the States more attractive. Patrick Blackburn, known for his presence as a lecturer at almost every past edition, did not attend ESSLLI this year. Instead, he gave a course at NASSLLI. A coincidence? When asked about this, Blackburn responds: "Alas, no deep dark secret here. Shortly after the Helsinki ESSLLI, I was emailed by the NASSLLI organisers and invited to give a course on hybrid logic. How could I resist?" Blackburn's opinion about the issue is clear: "Although there was pretty good European attendance at the first NASSLLI, one of the best things about the school was the large number of American students. Most of them probably would not have been able to attend an ESSLLI. So NASSLLI seems to be opening up LLI to a whole new audience."

It seems the importance of ESSLLI is not only in the summer school itself, but also in establishing and maintaining a close community with common interests. From this perspective, an American sister can only contribute. Blackburn: "I think it's great that both continents have their 'local' LLI school. And as a New Zealander, I can't resist hoping that one day there will also be a PASSLLI - a Pacific Summer School in Logic Language and Information! It'd be great to have schools like this in New Zealand, Australia, Hong Kong, Thailand, Japan, the Philippines, and so on. Maybe one day..."

The summer school in Stanford was of course only the first of a series. The second NASSLLI will be held this summer in Bloomington, Indiana (together with the TARK conference) and the program again looks promising. If you're interested, you can find out more at the website <http://www.indiana.edu/~nasslli>.

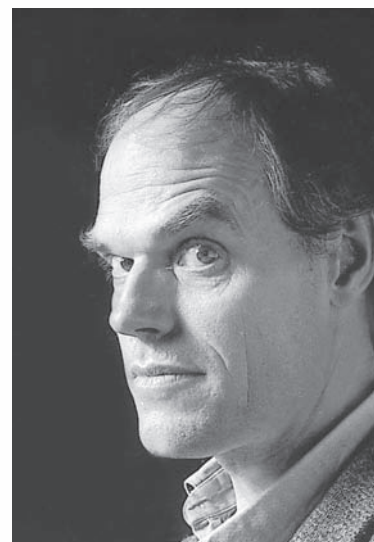
Balder ten Cate



Interview with Michiel van Lambalgen

'Logic meets Psychology'

Michiel van Lambalgen did his Master's degree in philosophy in Amsterdam and in 1987 he received his PhD with a dissertation entitled 'Random Sequences'. After that he worked for a year as a lecturer in probability and statistics at the Delft University of Technology. From 1988 until 1993 he was a Huygens fellow of NWO. In 1994 he became the principal investigator in the NWO Pionier project 'Reasoning with Uncertainty' at WINS at the University of Amsterdam. After the project ended in 1999, he worked as an associate professor in logic and AI. In 2001 he became a professor in logic and cognitive science. Together with Frank Veltman, he's the project leader of the NWO project 'Logic meets psychology: non-monotonic reasoning' which employs three PhD students.



needed to get a job and that was the job that was available. But actually it worked out quite well because I discovered some intellectually very interesting problems. One problem was the problem of vision, how do you transform retinal images into an image of the real world. I always thought that that was easy and then I noticed that the neural mechanics behind this is extremely interesting. And that gave me the idea to try to connect this up with the semantics of perception and with natural language. You asked me about what came out of the Pionier project: as far as my own contribution is concerned that is the result that I'm most satisfied with, the work I did with Jaap van der Does on the logic of vision. But apart from that I'm not too satisfied about that period because the project was a bit too large for my taste. What I'm doing now I like much better - a small group of PhDs working on related topics, whereas that project was much more diverse. I found it quite hard to turn it into a kind of coherent whole. But that was the first time I had to direct a research project so I had to learn everything from scratch.

How did the results in your dissertation relate to your later work and to the 'Reasoning with Uncertainty' project? What was the outcome of the project?

As for your first question, a part of the work that I did after my thesis was based on the idea that if you take randomness seriously then you have to adapt the foundations of mathematics. This was based on rethinking randomness and how it connects up with Brouwer's notion of free choice sequences. The same way as Brouwer observed that if you take free choice sequences seriously than you have to change the logic underlying mathematics, in the end I found that if you take randomness seriously than you have to change the axioms of set theory. That resulted in a number

of papers in the Journal of Symbolic Logic. In the end I solved the problem to my satisfaction but then it was unclear how to proceed from that stage, because there was a clear dilemma. Either you take randomness seriously or you take the classical Axiom of Choice seriously. I took randomness seriously but since the rest of the world took the Axiom of Choice seriously, there was nowhere to go from there, as it would have involved trying to convert people, and that's not my temperament. So I stopped doing this.

So you stopped doing it and you got into artificial intelligence and robotics.

Well, that was not a pure intellectual decision because I

Let us skip into the present. You're currently writing two books.

Yes. One of the books is on the semantics of tense and aspect, together with a German linguist, Fritz Hamm. It pushes through an idea that I learned of while I did artificial intelligence, namely the event calculus that is used in robotics. It's a very good mechanism for reasoning about planning and action, change... and I noticed that linguists talk a lot about events but they tend not to be very precise about what they mean. The event calculus offers some means to make that precise. What I found especially interesting is that there's lots of psychological evidence that our whole sense of time developed out of planning needs. The primates probably don't have a sense of time because they don't engage in much conscious planning. And since conscious sense of time and planning are so much intertwined, you might risk the hypothesis that tense as it is represented in natural language is also very much concerned with planning. We bring evidence from lots of data - at present from English and French - that that is actually the case, and the data will be expanded with facts from Russian. The interesting thing about this formalism is that it is extremely precise. It has been used in the planning for robots, for autonomous vehicles, so there's no

fudging there. The robot has to move by itself so the programming language that's used for it has to be very well specified and that means that if you translate this into the language domain, you can make very precise predictions. Actually, this connection between tense and aspect and planning has been advocated for a long time by Mark Steedman but he tried to formulate this in terms of some version of dynamic logic and that didn't work very well. Personally I think because dynamic logic is not very suitable to model continuous change, it's all about discrete changes. Tense and aspect needs something like continuous change. That's what we found.

What's the connection to your other book?

There is a relation: planning uses non-classical - non-monotonic - logic because you can never come up with a plan that works in all possible circumstances. You can only devise a plan for a specified number of contingencies and then you must assume that nothing else of interest will happen. A part of the other book is that we investigate the empirical import of this hypothesis. We propose that people reason not according to classical logic when they reason with conditionals but that they reason with kind of non-monotonic logic. And that works quite well, actually - we could explain data

from the classical experiment called the suppression effect. It was held by a number of psychologists that people are so bad at logic that they cannot even apply modus ponens. The reason for this is as follows: suppose you consider an argument with just two premises. 'If Fred has an essay to write, he's in the library' - that's the major premise, the minor premise is 'Fred has an essay to write'. Ok, then everybody draws the conclusion that Fred is in the library. Now suppose we add another premise 'If the library is open, Fred is in the library'. Now very few people actually draw the conclusion that Fred is in the library whereas, of course, if you reason monotonically, the addition of a premise doesn't make a difference. The so-called mental models school of Johnson-Laird and his disciples has used this as an argument for saying that logical rules don't play any role in thinking. Even a simple one, like modus ponens. But you can model this quite well in the non-monotonic logic that we developed. And if you look at that model then it's not that people are inept reasoners, that they can't even do classical logic, but they are more like virtuosos.

At several places you argue against evolutionary psychology as one of the antilogical approaches to human reasoning. What are your main points of criticism?

Our criticism - this is very much joint work with Keith Stenning - of evolutionary psychology is twofold. The first criticism is more of a technical nature - that their experiments are hopelessly flawed. But that's perhaps not the most interesting part, the interesting point is that they have a very wrong view of what logic is about. They view logic as a kind of overt reasoning mechanism, a kind of cognitive function, that is exercised when we give people a number of premises and we ask them to draw a conclusion. And they believe that that function is just a party trick, that it doesn't have any evolutionary value. This view is built upon the idea that you first have an interpretational process,





that you first interpret the sentences in natural language and on the basis of that interpretation you start to reason. And that only at the reasoning level logic applies. And that is dreadfully wrong because you can see that already at the interpretation level logic applies and that is because natural language is horribly underspecified, so you have to reason toward an interpretation. And you can see this quite clearly in the experimental protocols that we made pertaining to the Wason selection task. We gave the standard form, the form that has been used for 35 years, and it's clear that the subjects can't make any sense of what's written there. Hence, in order to get to a certain interpretation of what is really written there, you see that they engage in reasoning of the form "so, this sentence can mean this and this and this. And if it's the first possibility then I would get an answer that the experimenter already knows, so that cannot possibly be the meaning of what is said....". So one part of argument that you see here is the kind of dilemma argument - they have a vast range of possibilities for interpretation and they start to eliminate them one by one, drawing on, for instance, pragmatic factors. A very striking instance of this is that subjects don't know what the direction of if-then is. So if-then can mean 'p implies q', it can also mean 'q implies p' or it can mean 'p equivalent to q'. Then you look for contextual clues to determine what is meant. And some subjects found this clue in another part of the sentence that is involved in the Wason selection task. Namely, the crucial sentence is the rule that you have to verify or falsify: if there is a vowel on the one side, then there is an even number on the other side. So you have this curious anaphor - one side, other side. The subjects who are uncertain about the direction of the implication try to connect it up with the one side-

other side anaphor. The subjects reason as follows: one side-other side is symmetrical, it doesn't privilege one side of the card over the other side, so that means that implication also has to be symmetrical. This is just one instance of subjects using logic to come up with an interpretation. They start with some rather unspecified interpretation of the linguistic material and they begin to reason in order to arrive at a more definite interpretation. The data show that logic is absolutely fundamental to natural language understanding and the evolutionary psychologists did not see this. They wanted to dismiss logic because they had an aversion to what they call domain general mechanisms that apply across many different domains. They tend to see them in terms of modules which are developed as adaptations for a very specific function. Now logic was the obvious counterexample to this. The experiments performed by Cosmides had the goal of showing that logic was not so domain general after all - but the experiment is actually based on the radically wrong view of what logic is all about. One point we want to emphasize in the book is that the logic and natural language understanding are actually intrinsically intertwined. In that sense logic is completely domain general, there is no way you can do without. So the evolutionary psychologists who claim that all cognitive functions evolved as adaptations to specific needs - it's just nonsense. I should emphasize that we are not against evolutionary explanations but the explanations proposed by the evolutionary psychologists are just too primitive. We try to come up with something better.

In one of your talks you mentioned an experiment where people were given the imperative 'Hurry up! and you won't catch the bus.' and they interpreted it as 'If you hurry up, you will catch the bus'. Now that's clearly a mistake and I was wondering, how can you exclude the possibility that the subjects actually make a mistake, rather than that they are involved

in sophisticated reasoning? With some examples you gave in your ESSLLI lectures in Trento, I often thought myself that I had it wrong at first.

We are a bit wary of the category of mistakes because you often make mistakes for a very good reason. If you see one person making a so-called mistake, then you may not bother too much but if you see many people making the same sort of mistake, then you suspect a pattern. And the fact that you categorize this as a mistake yourself probably means that you have shifted your mind set or shifted your perspective, possibly influenced by the experimental setup - that you came to the problem with a different perspective originally. As for the bus example, the original sentence didn't make sense. That's why this type of examples is called pragmatic normalization - people try to put an interpretation on a sentence that makes sense in a given context. If you would have told them before that 'now we're going to show you a number of absurd sentences', they wouldn't make the mistake.

You were also involved in designing an alcoholic diagnostic system. Can you say something more about it?

Yes - two psychiatrists from the St. Luke's hospital in Amsterdam West came to me asking for statistical advice. Their problem was that they needed to construct a diagnostic system for alcoholism - there are some indicators of alcoholism - certain molecules in the blood, psychological profile, gross factors such as being overweight and so on. I was teaching Bayesian networks at the time... and I have to say that although I've been teaching the topic for years, I never constructed such a large network. We had to go through 400 articles to get the conditional probabilities...it was a lot of work but the system is working now with good results.

Marie Nilssonová

The Moderate Effectiveness of being Human

Peter van Emde Boas

The keynote speaker at the ILLC alumni meeting was **Professor Moshe Vardi** from Rice University, Houston, Texas. Moshe Vardi gave a lecture titled “*And Logic Begat Computer Science: When Giants Roamed The Earth*”. Before hearing the lecture, Professor Peter van de Emde Boas of the ILLC commented on the article.

Being invited to play the role of respondent provocateur against Moshe Vardi who certainly will present us with a convincing list of instances of the effective use of Logic in Computer Science and Technology is a Challenge. For someone closely connected to Logic in all its aspects as exhibited within our ILLC community the rhetorical question is whether there is an alternative at all, and if so, where to find it. Can we be effective in Computer Technology and Science and yet be Illogical at the same time?

I claim that this question can be answered affirmatively, and that this can be observed by simple inspection of the real world outside: we can be effective by being Human.

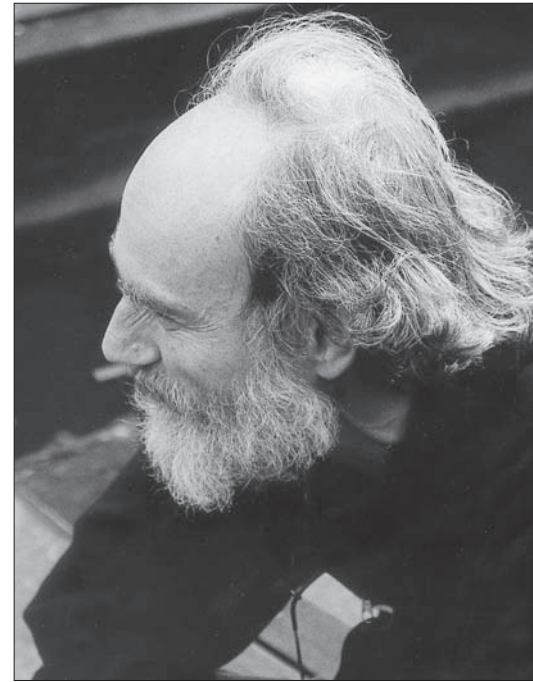
In fact, I claim that if we don't focus on the product itself (the justification of which may be described, analyzed and reconstructed in terms close to logic) but the process of discovery generating the artifacts of Computer Science and Technology we have to be aware that the ultimate initiators of the process of creating these artifacts are simple human beings, equipped with cognitive and intellectual capabilities which only for a small extent are related to what we call Logic. Man as a rational being can be understood in terms of logic (at least in part); man as an active

observer and actor in the outside world is much better analyzed in terms of our innate capacities going back to our Hunter-Gatherer past, and the Evolution Process before. And how often, when working as a Computer Scientist, are we thinking not in terms of the rational structure of the artifacts under consideration, but rather in a frame of reference of the antropomorphic observer, agent and participant in the artificial world under construction?

By way of example I will mention a number of topics, all related to Computer Science and Technology, where the Antropomorphic Embodied Perspective dominates the Rational Intellectual one, at least according to my naive perception.

The first examples originate in the world of Computation and Complexity Theory. The computational process can be described by means of a calculus (I.E., Logic) but most students and researchers will think in terms of machines operated by engineers, possibly extended by homunculi on the inside moving the parts around.

A classic topic is the use of the Adversary Argument in proofs of lower bounds in algorithms and complexity. The name itself evokes the image of the devious agent maliciously generating the least informative answers and enjoying himself in the suffering of the agent



representing the algorithm. A logical reconstruction is possible but why would we need it?

Another class of arguments in Complexity Theory is patterned after the taxman ascribing parts of the total cost of the algorithm, to particular entities manipulated by the algorithm, thus providing a refined tool for estimating the total cost in terms of the number of entities and the cost assigned to each of them. This can be reconstructed in a rational way using mathematical and logical tools, but the inspiration definitely originates in the social concept of fair taxation.

In this context it is a remarkable omission of my worthy opponent in his “Effectiveness of Logic” paper not to mention the fact that one of the two independent discoverers of the Immerman-Szelepczényi result that Nondeterministic Space is closed under Complimentation, obtained this result within a logic frame of reference; a strong argument in favour for the logical against the antropomorphism debate.

There are other interfaces between Computer Science and Technology and the embodied perspective of man. We all know about the Turing test proposed as a tool to discriminate between artificial and human intelligence by means of rational interaction with an invisible opponent. The issue at stake here is rational intelligence. But recently a similar test aimed at a different aspect of being human has been introduced as a tool for discriminating between human web-surfers and web-crawling robots: the so-called Captcha's. These are simple puzzles intended to be trivial for humans but beyond the power of AI signal processors. The challenges involve tasks like recognizing pairs of words printed on top of each other in a blurred way (designed in order to make existing character reading systems ineffective), or selecting a picture based on free association. The challenge has been accepted by the AI community, and their initial progress is beyond expectation. The

jury is still out. The logician once again realizes that there is great need for work on the logic of the visual world.

How far can one move away from the realm of logical rationality and yet be immersed in Computer Technology? During the past years, in my role of OOPSLA participant I have become involved in the

“If a technology is not magical it is insufficiently advanced”

activities of the Feyerabend community initiated by Richard Gabriel. Gabriel was at this year's OOPSLA the organizer of the new “Onwards” track where papers were presented speculating about potential new directions of our

trade, taking inspiration from “alien” frames of reference like art and nature. One of the papers presented by David West has the suggestive title “Magic”. Starting from Arthur C. Clarke's adagium that any sufficiently advanced technology is indistinguishable from magic, he reverses it into “If a technology is not magical it is insufficiently advanced”, and subsequently the author discusses how a piece of hardware should have to behave in order to be perceived as a magic object, and the feasibility of actually building such hardware.

So, notwithstanding the perceived success of the logic and rationality perspective in Computer Science and Technology, we must remain aware of the fact that it is just one perspective and that there are others. I am convinced that alternative perspectives in practice dominate at least in the realm of discovery, and that the plain embodied human perspective, regardless of the fact that it lacks a formalized base, is still dominant out there. Grace be to our recent involvement with Cognitive Science and Games I believe that ILLC is an excellent place to take these alternative perspectives serious, and to contribute toward the highly needed rational reconstruction and eventual justification of the usable parts of these approaches.

After all there is no shame in being Illogical. In the classic Star Trek TOS episode “The Gallileo Seven” it is a highly irrational act of Dr. Spock (Mr. Logic himself) which brings about the happy ending of this episode. There is life beyond Logic.

The content of Moshe Vardi's lecture was for a large part based on the article “On the Unusual Effectiveness of Logic in Computer Science” (Bulletin of Symbolic Logic, Vol 7, Nr 2, 2001) coauthored with Joseph Y. Halpern, Robert Harper, Neil Immerman, Phokion G. Kolaitis, and Victor Vianu.

Immerman and Szelepczényi meet for the first time during the FCT '89 Szeged, Hungary.



New PhD students

New PhD students

New PhD students February 2002 - 2003

Clemens Kupke (Germany), PhD student as of 1 February 2002



After finishing my mathematics degree in Munich, I became a

PhD student in Jan Rutten's and Yde Venema's NWO project about Coalgebras and Modal Logic.

Neta Spiro (Israel), PhD student as of 1 February 2002



What are the musical characteristics used in the perception of phrase by performers

and how are they used? - these are the central questions that I am currently exploring in my PhD research in Dr. Rens Bod's group.

Aline Honingh (The Netherlands), PhD student as of 1 February 2002



I'm in the group of Rens Bod, working on the vernieuwings-impuls project

'Towards a unified model for linguistic, musical and visual processing'.

Valentin Jijkoun (Russia), PhD student as of 1 February 2002



Having background mainly in computer science, logic and automated

reasoning, I am now enjoying my research of language with all its complexities and ambiguities.

Katrin Schulz (Germany), PhD student as of 1 July 2002

I'm working in the "Logica ontmoet psychologie: niet-monotoniteit"-project of Michiel van Lambalgen and Frank Veltman, where I will focus on counterfactuals.

Mehmet Tepedelenioglu (USA), PhD student as of 1 August 2002

I studied electrical engineering and mathematics and became a PhD student in Dick de Jongh's and Johan van Benthem's project on Constructive and Intensional Logic.

Sjoerd Druiven (The Netherlands), PhD student as of 1 September 2002



I graduated in AI at the University of Groningen. I am a part of a project called InGMA

in which I will invest complexity issues concerned with games of imperfect information, under the supervision of Peter van Emde Boas and Johan van Benthem.

Merlijn Sevenster (The Netherlands), PhD student as of 1 September 2002



I studied AI and philosophy after which I applied for a PhD position devoted to

modeling imperfect knowledge games and analyzing their complexity theoretical properties.

Börkur Sigurbjörnsson (Iceland), PhD student as of 1 November 2002



I graduated as a Master of Logic from the ILLC. My research project is about

information retrieval and semi-structured data, e.g., XML.

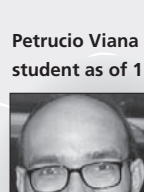
Marian Counihan (South Africa), PhD student as of 1 December 2002



I have a background in math and philosophy, although in my PhD I will be doing

research (both theoretical and empirical) into human reasoning patterns. The work will combine topics from semantics, linguistics, psychology and logic.

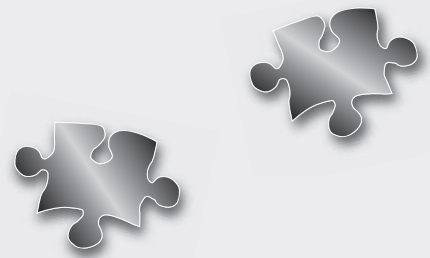
Hartmut Fitz (Germany), PhD student as of 1 December 2002



Petrucio Viana (Brazil), PhD student as of 1 January 2003

I am a PhD student at the Federal University of Rio de Janeiro and I'm

staying at the ILLC for a year to develop a part of my thesis, which is about two-sorted modal logics.





Alumna door alumnus

Catarina Dutilh Novaes
Foto: Jeroen Bruggeman