NEWSLETTER

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Human-Robot Personal Relations

Embodied Cognition 2008

2nd NSVKI Student Conference

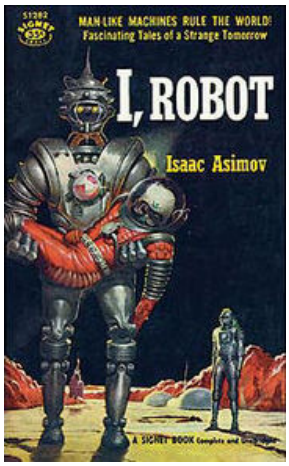
News from the Belgium-Netherlands Association for Artificial Intelligence

I, Robot

Editor-in-chief

When I was still young, I was an avid fan of science fiction. I was especially fond of that part of the genre, in which stories were based on extrapolations of current research and technologies (in my eyes the only *real* science fiction). One of my favourite writers of course was Isaac Asimov, and especially I liked his robot books, of which *I, Robot* (1950) was my first and best. In this book he came up with his Three Laws of Robotics, explicated for the first time in the story entitled *Runaround* (1942). The Three Laws are the rules to which (almost) all robots in Asimov's writings (and also almost all robots appearing in other science fiction writings) should obey. They read:

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey orders given to it by human beings, except where such orders would conflict with the First Law.
3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.



Cover of *I, Robot*, illustrating the *Runaround* story.

These Three Laws can be seen as the start of a discipline, now called Roboethics. Being pure science fiction half a century ago, now the progress in robotics makes ethical questions around robots a hot topic. Especially David Levy's Ph.D. thesis *Intimate Relationships with Artificial Partners* (Maastricht University, 2007) was full of anticipation (some say speculation) of future developments, in which robots intrude (excusez le mot) human life. Levy's Ph.D. thesis primarily focused on the future technical possibilities, and left ethical questions largely aside. Obviously, serious discussions and conferences on the behaviour of robots in relation to humans were asked for.

Not unexpectedly, the 1st International Conference on Human-Robot Personal Relationships was held at Maastricht University, on June 12-13, 2008. In this issue you even find two reports on this event. Besides 12 "regular" presentations (including one by David Levy, who now did present his ideas on ethical robot issues, in *The Ethical Treatment of Artificially Conscious Robots*) the event hosted no less than 5 invited speakers. The most famous of these, maybe not from a scientific point-of-view, but surely regarding media attention, was dr. Joanne Pransky. Although not being present alive at the conference, she made her presentation remotely from California via a robotic system. She calls herself the world's first robotic psychiatrist and presents herself as the reincarnation of Isaac Asimov's character Susan Calvin, the famous robopsychologist.

By the way, surfing on the internet on the topic of robotics and especially roboethics I found the website of one of the most prestigious technology labs, namely INL (Idaho National Laboratory), which has a great section on adaptive robots in general, humanoid robots in particular, and even on ethical considerations concerning humanoid robots.

Wikipedia's entry on Isaac Asimov: **http://en.wikipedia.org/wiki/Isaac_Asimov**
Wikipedia's entry on the Three Laws of Robotics: **http://en.wikipedia.org/wiki/Three_Laws_of_Robotics**
Wikipedia's entry on Robopsychology: **http://en.wikipedia.org/wiki/Robopsychology**
Dr. Joanne Pransky's home page: **http://www.robot.md/**
INL's adaptive robots pages: **http://www.inl.gov/adaptiverobotics/index.shtml**
INL's ethical considerations for humanoid robots:
http://www.inl.gov/adaptiverobotics/humanoidrobotics/ethicalconsiderations.shtml

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The photograph on the front cover is by Huub Prüst, the ones on pp. 52-53 are by Jeroen Janssens, and those on p. 58 by Eric Postma.

Front cover: interview with the robot "incarnation" of Joanne Pransky.

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

BNVKI-Board News

Antal van den Bosch

BNVKI can pride itself with the enthusiasm of its members to submit papers to BNAIC and also to go to this great event that continues to strengthen our ties. This year, an intermediate count before the deadline shows an excellent turnout of 101 submissions. We hope you will be able to make it to beautiful Bad Boekelo for what will be the twentieth meeting of our association.

Thinking of the longitude and constancy of BNAIC and BNVKI, it is sometimes worthwhile to remember that we have strong and silent partners that have helped us carry on over the last decade: SIKS, and NWO (the EW area). Both parties, one the graduate school that many of our members are part of, the other the major funding organisation of academic AI research in the Netherlands, support us for keeping our community a community – through the BNAIC and other BNVKI events and through this newsletter. As there is never a precise moment to thank these organizational bodies for their sustained support, I take the opportunity now to express the board's immense gratitude for that.

We are easing into the summer, which will give us some opportunity, I hope, to rest our bodies and minds. The board wishes you a great summer holiday. See you right after!

First International Conference on Human Robot Personal Relationships

Jeroen Janssens
MICC, Maastricht University

A sexy title indeed. And one that sells too. But behind the ostentatious news articles, serious research is being conducted. It was in fact David Levy's Ph.D. thesis *Intimate Relationships with Artificial Partners* that inspired Maastricht University to organize the first "International Conference on Human Robot Personal Relationships (HRPR2008)" on June 12 and 13.

The interdisciplinary nature of the field Human Robot Interaction was made clear by the variety of topics covered by the different talks. They ranged from ethical aspects by Ronald Arkin to language processing by Yorick Wilks, and from emotional attachment by Astrid Weiss to praying by Anne Foerst.

Anne Foerst participating in a lively discussion.

Instead of attending the conference in person, Joanne Pransky presented via a remote connection. From California, she controlled a robot which enabled her to move around. And since the robot also displayed her face, it still appeared as if she was there. In the picture on the front cover you can see Joanne being interviewed.

At least as interesting as the talks were the lively discussions that followed. Because subjects such as ethics, emotions, and love are so prevalent in everyday life, everybody was able to participate in the conversations. And although there was not always consensus – on the essences of love for example – there was a very nice atmosphere during those two days.

According to Ellen de Bruin and Carola Houtekamer from the *NRC*, three things became clear during the conference: First, there have always been people that wanted to create machines according to their own image. Second, either you love or hate the idea that in the future we will have relationships with robots. Third, it will take several decades before we can create a humanoid robot.

Anne Foerst agrees with the last point, but argues that it should not stop us from asking ourselves these ethical questions. By the time that loving robots become a fact, we will be prepared. And at the moment, the answers tell us more about how we should treat each other, than about the robot design requirements.

Myriam Diocaretz concluded the conference by saying that ethics is a key issue to focus on, and that we should reflect on human robot personal relationships, especially in terms of the effects upon humans.

Because the conference was a real success, it will be organized again next year, on June 11 and 12. However, HRPR2009 will not take place in Maastricht, but in Tilburg. Different location, same title. Because it is still sexy.

Panel discussion: from left to right Ronald Arkin, Anne Foerst, Yorick Wilks, Myriam Diocaretz, and David Levy.

To give an idea of the diversity of the topics in the conference, we below provide the abstracts of the twelve presentations in the paper sessions of the conference. A selection of the papers will appear in a special issue of a new Springer journal, *International Journal of Social Robotics*, to appear in 2009. Check the conference website http://www.unimaas.nl/humanrobot/ for more information.

Gender Representation and Domestic-Use Humanoid Robot Design; John D. Bransford, Julie Carpenter, Joan M. Davis, Tiffany R. Lee, Nancy Vye, and Norah Erwin-Stewart, University of Washington, Seattle, USA

"Advances in robotics are making the possibility of humans working and living regularly with robots a reality. To date, a wide variety of robots with aspects of socialness have been developed for entertainment and assistance purposes. One challenge to be considered when designing robots for the home is the representation of the robot's gender.

The gender of humans affects how we interact with them. Humans often assign gender to inanimate objects; for example, cars and boats are commonly female in Western culture, and dolls can universally be either gender. Some humanoid robots are designed with obvious gender orientation, such as REPLEE (Osaka University and Kokoro, Ltd.) while others are less distinct, such as ROBOVIE (ATR Laboratories). Morphology, overall appearance, behavior, voice, gaze, gesture, functionality, context, and cultural expectations all impact the user's concept of gendered robots.

While it is likely that robots with distinct gender appearance and actions will make human-robot communication more effective in some scenarios, the absence of gender in other robot designs may work better by causing less distraction for the user."

"I love this Dog" – Children's Emotional Attachment to the Robotic Dog Aibo; Astrid Weiss, Daniela Wurhofer, Manfred Tscheligi, University of Salzburg, Austria

"Emotional attachment is defined as the sum of cumulated emotional episodes of user's experiences with a device. In this paper we present a methodological variation of assessing emotional attachment of children and adults to the robotic pet AIBO using an untypical application area (a shopping mall) and leaving the participation in the study as totally voluntary.

This free exploration case study is situated in a shopping mall for two reasons: (1) People do not expect a robotic pet in this context (first time reaction) and (2) the context allows (2a) to address a high number of possible participants and (2b) to create awareness for robots in general.

To investigate the methodological concept and to find out if such a setting can be beneficial for a better understanding of the influence of first time contact with a robotic pet to the emotional attachment, we conducted the case study on three consecutive work days. We are able to show that the method reveals interesting and novel aspects on the development of emotional attachment."

Wanting the Impossible – the Paradox at the Heart of Human-Robot Relationships; Dylan Evans, University College Cork, Ireland, UK

"Fiction abounds with stories of romantic relationships between humans and robots, from the tragic love of Nathaniel for Olympia in Hoffman's "The Sandman" to the apparently mutual attraction between Deckard and Rachael in Bladerunner. Recently, some have speculated that such relationships may soon be real. In his book, "Love and Sex with Robots", for example, David Levy has argued that "love with robots will be as normal as love with other humans".

There is an obvious objection to such predictions – namely, that love between humans and robots is not possible because robots are not capable of freely choosing – they cannot reject you. Levy anticipates this objection when he recognises, near the end of the book, that an important part of sexuality is "the possibility of failure or denial". His response to this objection is that sexbots will need to be able to mimic human "capriciousness". The use of the word mimic here is crucial, however."

Combining Moral Theory, Modal Logic and MAS to Create Well-behaving Artificial Agents; Vincent Wiegel and Dr. Jan van den Berg, Delft University of Technology, The Netherlands

"Witnessing a growing number of increasingly autonomous software agents that are able to intersect with us or that operate on our behalf under circumstances that are not fully known in advance, we argue that there is a strong need to provide these agents with moral reasoning capabilities.

Looking at the current literature on behaviour constraints and multi-agent (software) systems (MAS), one can distinguish various topics.

The first topic concerns the analysis of various forms of restraint and their basis. This topic is at the core of moral philosophy (Van den Hoven and Lokhorst 2002).

The second topic concerns the formalized specification of, and the reasoning about the constraints. The research on this topic focuses predominantly on the use of logic, mostly modal logic (Dastani, 2001, 2004) (Sergot, 2001), (Boella, Van der Torre, 2004), and defeasible logic (Governatori, 2002, 2004).

The last topic is the MAS and implementation related topic of designing a working system in which there are rules that can be enforced and deviant behaviour be detected (Artakis, 2002)."

LOVOTIC: LOVE and ROBOTIC Affective States Based on Visual Perceptions; Hooman. A. Samani, S.S. Ge, and C.C. Hang, National University of Singapore, Singapore

"In our research, we focus on developing the feeling in the robot to make the dream of "The robot falling in love" possible. The aim is to create the romantic relationship between human and robot. By Lovotics, we mean the study of love and robots.

Consequently, we propose "LOVOTIC" to indicate the combination of "Love" and "Robotic" as the research area for relationship between human being and robots. Our aim is to develop several modules and integrate them to build up a system for such purpose.

The robot requires data acquisition from human and the process of that. Based on such information the internal states of the robot would change. States, moods, emotions, affects, and interactions are key modules in this research.

In the paper, we present an active system in order to capture the visual information of the user to develop the model as internal states in the robot. The state of the robot refers to a quality of feeling at a particular time as distinctive emotional quality. The internal state is the condition that activates behavior and gives it direction. We model the internal state of the robot as 3D graph of Motivation, Activation and Stance. States and sub-states have intersections as most of them are not pure. The feeling of love could be considered as cross interaction with other internal states."

Evolutionary Ethics in Agent Societies; Dr. Pieter Spronck and Berend Berendsen, M.Sc., Maastricht University, Maastricht, The Netherlands

"To investigate whether the theory of evolutionary ethics is a valid explanation for the existence of a moral sense, we approach the ethical issues of morality from a computational point-of-view. We define a model of multi-agent societies, in which agents are able to evolve a moral sense. In the model, moral sense is defined by every agent's personal set of rules, which determines its interaction with other agents.

By performing simulations of the model we investigate under what circumstances the agents in the societies develop a moral sense which allows the society to thrive.

We use four different conceptual agent designs: (1) agents with a minimum of attributes, (2) agents with family relations, (3) agents with a memory, and (4) agents with reputation in the society. From our results we may conclude that there are circumstances under which agents evolve a moral sense, those circumstances being specific settings of family relations and reputation."

Is there a Role for Sentiment Mining in Human-Robot Communications; Prof.dr. Jan Scholtes, Maastricht University, Maastricht, The Netherlands

"A proposal is made to use sentiment-mining techniques from the field of text-mining to derive a corpus that contains structured and analysed

emotions and sentiments that are linked to natural conversations between humans.

This corpus can then be used in Human-Robot conversations and simulate human behaviour as good as possible."

Personal Robots, Appearance, and the Good: a Methodological Reflection on Roboethics; Mark Coeckelbergh, University of Twente, The Netherlands

"There is an international trend in robotics from industrial applications towards robots that play a role in personal life. The development of pet robots, toy robots, and sex robots suggests a near-future scenario in which living with robots will be as habitual as living with TV, mobile phones, and internet.

Such 'personal robots' will 'share physical and emotional spaces with the user' (Cerqui and Arras 2001). They could play a role in entertainment, education, household, and health care. Sometimes they are called 'social robots', and Turkle has proposed the term 'relational artefacts'.

Perhaps we will enter in relationships with robots (Levy). In any case, personal robots are likely to have a significant impact on the quality of our lives and existence. How can and should we evaluate living with personal robots?"

On Alignment of Eye Behaviour in Human-Agent Interaction; Huub Prüst, Robbert-Jan Beun, Rogier M. van Eijk, Utrecht University, The Netherlands

"Intelligent user interfaces provide smooth interaction with the user, possibly by employing an embodied conversational agent. This paper argues that human-agent interaction improves by provoking alignment of coordination devices. Thereby we concentrate on eye behaviour.

We show that automatic alignment of eye behaviour, described for human-human interaction (Pickering & Garrod, 2004), carries over to human-agent interaction.

We experimentally investigate the role of alignment of eye behaviour and attention on the fluency of interaction and user-perception in human-agent interaction. A pilot study of interactions between humans and the embodied conversational agent iCat (Philips Research Technologies) indicates that an agent that simulates eye contact and attention, provokes more eye contact from the user which increases fluency of interaction and perceived alertness of the agent."

The Ethical Treatment of Artificially Conscious Robots; David Levy, London, UK

"The ethical aspects of robotics have recently gained sufficient importance to be debated in international forums and to be endowed with their own collective nametag – roboethics. Almost all of the discussion within the roboethics community and elsewhere has thus far centred on questions of the form: "Is it ethical to develop and use robots for such-and-such a purpose?"

The questions are based upon doubts about the effect that a particular type of robot is likely to have, both on society in general and on those with whom the robots will interact in particular.

What has usually been missing from the debate is the complementary question: "Is it ethical to treat robots in such-and-such a way?" Here we attempt to redress the balance, having first reviewed some of the relevant literature."

Autonomy and Us: Using Psychological Understanding to Inform Autonomous System Design; Tim Harrison, University of Bath, UK

"The current generation of autonomy and artificial intelligence is potentially approaching something of an apex. Developments in processing power have enabled systems to employ parallel processing power and innovations in programming to great effect. It can be reasonably argued that rudimentary autonomy has been achieved, and is being refined upon by the research community at large.

This level of autonomy is only half the problem, however. Currently, there exist embryonic forms of behavioural autonomy; systems that react in a predictable manner to input, and lack true independent reasoning and decision making abilities. Already there are growing expectations on behaviorally autonomous systems to fulfill the expectations of constitutively autonomous entities – that can think, reason and replicate the capacity of humans.

The challenge that research faces is to start to look into the more seemingly intractable problems of higher-level autonomy and artificial intelligence and attempt to provide viable systems that fulfil some aspects of these expectations. It is the contention of this paper that the means with which to fulfil these goals lies in incorporating psychological understanding of the human mind into autonomous system and AI design."

Looking Forward to Sociable Robots; Glenda Shaw-Garlock, Simon Fraser University, Vancouver, Canada

"This work examines the emergence of humanoid social robots in Japan and the United States with a view to comparing and contrasting two prominent social robot projects. Two humanoid social robot projects are considered in this paper.

In the American case, I look at the work of Cynthia Breazeal at the Massachusetts Institute of Technology (MIT) and her social robot, KISMET. In the Japanese case, at the Osaka University, I consider the work of Hiroshi Ishiguro and the humanoid social robot REPLIÉE-Q2.

Inspired by the framework of Weber and Bath, I first distinguish between the *utilitarian* and the *affective social* robot and situate KISMET and REPLIÉE within the latter category. Then, drawing on video interviews, text interviews, and the published works of Breazeal and Ishiguro I examine the proposed vision of each researcher."

Conference on Human Robot Personal Relations: Some Reflections

Kristof Goris and Jelle Saldien
VUB, Brussels

Instead of giving straight answers or solutions to some aspects of human-robot relations, this conference brought up even more questions and problems regarding the future of living with personal robots. This clearly resembles the complexity of this new area of research, and also the endless possibilities and consequences it will bring along. Some of the questions are addressed to the entire public covering some main ethical issues, such as "Should robots have legal rights?" or "Who is responsible for a robot's actions?"

We think the technological development is still in an early stage in order to reach conscious robots. Nonetheless robots are being developed to act as social companions. One of the first challenges will be the creation of a robot that can really act as an animal and have a pet-like relationship with his owner, rather than the creation of a conscious humanoid robot. When creating a robot pet we have to bear in mind the new possibilities and advantages a robot has in comparison to an animal pet. From this point of view a new area of robotic research is recently being explored termed as robot assisted therapy (RAT). In RAT, robots are used instead of animals for therapeutic treatments, mainly in hospitals or specialized medical centers. Some existing robots are already being tested for RAT such as PARO, AIBO, ICAT and NECORO.

At the Vrije Universiteit Brussels, we have started with the development of PROBO, a huggable robot that also will be used to explore RAT. For now the main focus is to create a robot, serving as a social interface, controlled by a human operator. The robot itself will have autonomous animal-like reactions and the ability to communicate social cues such as eye-contact, facial expressions and affective speech.

Because our robot will be used to interact with children, one of the main priorities is to ensure an intrinsic safe interaction. For now the operator will be responsible for the actions of PROBO, but in the future the robot will become gradually more autonomous. Apart from the technological challenges we are facing, we also need to deal with the ethics in creating a robot for therapy with humans.

This conference gave us the idea that a lot of researchers are facing these same ethical issues. And for sure it can play an important role in bringing more of these people together to think about the possible consequences of robots as "beings", rather than machines, in our daily lives. We are looking forward on what the next conference on Human Robot Personal Relations will bring.

Symposium Embodied Cognition 2008

Giel van Lankveld
MICC-IKAT, University Maastricht

On June 25th the embodied cognition symposium was held at Maastricht University, on the day preceding Guido de Croon's Ph.D. defense. The symposium brought together researchers from diverse fields, such as psychology, computer vision, and (evolutionary) robotics, to showcase some of the current research in the field of embodied cognition. The event hosted six talks by different speakers.

Eric Postma opened the event with a brief overview of embodied cognition and a history of cybernetics, symbolic AI, and the "new" AI. He also discussed developments in biology, psychology and cognitive neuroscience and their influence on our current views on humans as embodied systems.

The first talk, *Attention and Exploration in Object Recognition*, was given by Gert Kootstra from the University of Groningen. The talk reported on two

object-recognition models that addressed the selection of suitable locations for local image processing. In human vision, these locations are selected by means of eye movements. At the selected locations, the eyes are fixating to process the local visual information. The first model concerned the selection of suitable locations for object recognition through isotropic symmetry of the object. To this end, the model compared different parts of an image for symmetry at different scales. Model simulations showed a more accurate prediction of human fixation locations than those obtained by the state-of-the-art attentional model of Itti and Koch. The second model improved upon the first model, by employing an advanced fixation-location-selection algorithm called SIFT. The fixation locations are called keypoints in SIFT. Using the second model, a robot could recognize objects actively by moving around them and selecting high-quality keypoints using the SIFT algorithm. The keypoints could successfully be stored into a database using a clustering algorithm which groups similar keypoints. The model accurately identifies objects from different viewpoints and is much faster than existing methods.

The second speaker, Vito Trianni from Consiglio Nazionale della Ricerca in Rome presented *Self-organising Sync in a Robotic Swarm*. A set of simple rules was used to teach individual and swarms of robots to produce a specific behaviour. Trianni's main interest was in the emergence of coordinated behaviour in which multiple robots synchronize their behaviour. The simulation environment was defined by a floor pattern with a gradient of intensity values defining a kind of river that robots have to cross repeatedly. The robots sense the intensity of the floor through light sensors and sense a high pitched tone emitted by other robots through auditory sensors. Robots emit the tone each time they start crossing the river. Trianni used artificial evolution in a simulator to produce effective behavioural rules. The results obtained depended on the number of robots involved in the simulation. In many cases that the desired coordinated behaviour was observed, robots would produce oscillatory behaviour and perform this behaviour in synchrony. In a real environment involving physical robots, the behaviour deviated from the simulations due to sensor noise. In one type of simulation, the robots did not perform desirably. Under certain circumstances each of the robots would emit the sounds in turn, so that an uninterrupted sound was generated in the simulation. As a consequence, the timing of the sound could not be used as a cue for synchronizing behaviour. Trianni concluded by showing that dynamical-systems theory can be invoked to explain the observed behaviours.

The next speaker was Dana H. Ballard from the University of Texas, Austin, famous for his work on biologically inspired vision models. His lecture was titled *Embodied Visual Cognition*. The talk was accompanied by clear visual examples demonstrating research into the eye movements during the execution of complex tasks, the competition for eye-movement control by various cognitive processes, and the subdivision of complex behaviours into micro behaviours. Ballard clearly demonstrated how reinforcement learning can be used to model the acquisition of complex motor tasks built up out of micro behaviours. In his view, eye movements serve as a mechanism to reduce uncertainty about the current state. The most important behaviour receives control over the eye movements to execute the task under consideration. Ballard used a dynamic Bayes network to determine the probability of a task given the previous tasks. Given a sequence of observed human behaviour, the resulting system can recognize and classify the task currently executed and predict the upcoming task to be executed.

Justus Piater from the University de Liège presented *Vision as Inference in a Hierarchical Markov Network*. He explained how vision is simultaneously a bottom-up and a top-down process. In his experiment a neural network was trained to recognize the location of specific visual features in relation to other learned visual features. A Markov network represents the probability density functions of feature configurations. The higher up in the network, the more complex the feature configurations become. The probabilistic formalization allows for effective probabilistic inference from the sensor data (bottom up) and expected class membership (top down). The hierarchical Markov Network can be applied to 2D as well as to 3D tasks and can also be used to train a robotic controller to manipulate objects. The excessively large processing loads form a major obstacle for upscaling the network. Piater is trying to deal with this problem by invoking grid techniques.

Bart Remes and Christophe de Wagter from the Delft University of Technology presented a live demonstration of a flying robot in their talk *Micro UAVs – the Delfly*. The Unmanned Areal Vehicle (UAV) Delfly has a size of only 15 cm and weighs less than 5 grams. It is capable of complex maneuvers including vertical takeoff and landing. The Delfly has four wings divided into two pairs and comes equipped with two cameras, one looking forward and one looking down. Bart Remis used a remote control to steer the Delfly through the lecture

room, impressing the audience and attracting the attention of passing students. The aircraft is a suitable candidate for embodied-cognition research since both cameras produce a very stable visual image and the craft can be controlled using 3 simple commands only. The Delfly team has currently succeeded in using the camera images to determine altitude, speed, yaw and pitch, which are needed for stabilization of the robot. The future work aims at incorporating advanced AI and to further decrease the Delfly in size to 10 cm and eventually even to 5 cm. The main constraint in adding intelligence to the Delfly is weight.

The Delfly demonstration.

The final speaker was Guido de Croon of Delft University of Technology (previously at Maastricht University) talking about *Implicit Knowledge in Visual Control*. De Croon uses Gaze control models to solve tasks such as the identification of gender in faces and robot navigation through potentially dangerous areas. The largest part of his presentation was dedicated to a control task where an adaptive agent learns to drive a car through a track with obstacles using a very small window only through which visual information enters a recurrent neural network. De Croon shows that an adaptive approach can produce efficient behaviour and can even lead to the occurrence of "reflex" behaviours in some circumstances. An important conclusion of his research was that in some cases, gaze switches ("eye movements") are not used for collecting information about the sensor input, but for other purposes such as the suppression of a response.

Guido de Croon.

SIKS-Evaluation Days
June 2-3, 2008 in Amsterdam

Richard Starmans
SIKS Managing Director

On June 2 and 3, 2008 the SIKS-Evaluation Days took place at the Vrije Universiteit in Amsterdam, SIKS' administrative university. Here, the management team of SIKS, its board of governors and several senior staff members of the school faced an international peer review committee. This committee came to the Netherlands, especially for the occasion of assessing the scientific and educational program of SIKS; both our performance during the last accreditation period and our plans for the next period of six years were scrutinized. This peer-review is an essential and necessary step in the accreditation track of ECOS from KNAW. The international committee, chaired by Prof. Gerard Renardel de Lavalette will produce a written report in due course, based on the SIKS-selfstudy and, of course their findings and experiences from June 2 and 3 in Amsterdam. Along with our self-study this report will serve as an input for the re-accreditation request, that will be submitted to KNAW by the end of 2008.

Three members of the peer review committee, Prof. Colette Roland, Prof. Carles Sierra and Prof. Karl Aberer visited us in Amsterdam, whereas the two other members, Prof. Tom Mitchell and Prof. Enrico Motta, participated in some meetings remotely. Over 25 SIKS-members where involved in an intensive two-day program organised by the MT: our scientific director Prof. Roel Wieringa, board-members, focus-leaders, course directors, Ph.D. students and, last but not least, our two honorary members: Prof. Reind van de Riet and Prof. John-Jules Meyer. After two days of presentations, meetings and discussions, the committee came up with its first comments and feedback for SIKS. Both scientific director and board agreed that this initial oral report by the committee was very positive and encouraging. We are now confident that the written report will not only help us to take a further step towards re-accreditation, but will also be instrumental in further improving the activity-program for our 400 members.

The schedule below gives an impression of the participants and the topics they addressed. It must also be emphasized that thanks to the efforts and organisational skills of the chair of the board of governors, Prof. Hans Akkermans and especially Mrs. Elly Lammers from the VU, who was responsible for the local organisation, everything went smoothly in Amsterdam.

Monday June 2, 2008

9.30 - 9.35 Welcome by Prof.dr. J.M. Akkermans (VUA), Chair Board of Governors SIKS
9.35 - 10.00 Internal Meeting Evaluation Committee (EC)
10.00 - 11.00 "SIKS: Facts, Figures and Foci", Prof.dr. R.J. Wieringa (UT), Scientific Director SIKS & Dr. R.J.C.M. Starmans (UU), Managing Director SIKS
11.00 - 12.00 Discussion EC with Management team SIKS
12.00 - 13.00 Lunch
13.00 - 13.30 Presentation: Focus Computational Intelligence I, Prof.dr. A.P.J.M. Siebes (UU)
13.30 - 14.00 Presentation: Focus Computational Intelligence II, Prof.dr. H.J. van den Herik (UM)
14.00 - 14.30 Presentation: Focus Web-based Information Systems, Prof.dr. M. de Rijke (UvA)
14.30 - 15.00 Break
15.00 - 15.30 Presentation: Focus Enterprise Information Systems, Dr. H. Weigand (UvT)
15.30 - 16.00 Presentation: Focus Agent Technology, Prof.dr. J.-J.Ch. Meyer (UU)
16.00 - 16.30 Presentation: Focus Knowledge Representation & Reasoning, Prof.dr. F. van Harmelen(VUA)
16.30 - 17.00 Discussion EC with SIKS presenters and MT
17.00 - 19.00 Internal Meeting EC
- - 22.00 Dinner EC offered by SIKS Board of Governors

Tuesday June 3, 2008

9.00 - 9.30 Presentation: Focus Data Management, Storage & Retrieval, Dr. A. de Vries (CWI)
9.30 - 10.00 Presentation: Focus Human Computer Interaction, Prof.dr. C. Jonker (TUD)
10.00 - 10.30 Break
10.30 - 11.30 Meeting and discussion EC with SIKS PhD Student Advisory Committee
11.30 - 12.30 Internal Meeting EC
12.30 - 13.30 Lunch
13.30 - 15.00 Internal meeting EC (MT-SIKS available for discussions whole afternoon)
15.00 - 16.00 EC presents committee feedback to SIKS; MT-SIKS gives a first reaction
- End of evaluation

SIKS-members interested in obtaining a copy of the SIKS self-study are kindly requested to contact the SIKS-office: office@siks.nl

2nd NSVKI Student Conference

Nico Vlaming
4th-year student CKI, Utrecht University

For the second time in the short history of the NSVKI the Student Conference (SC) was held on the 6th of June. This time Utrecht hosted the afternoon filled with interesting talks from students from all over the country.

Edwin van de Koppel was the first speaker from the Utrecht University. His talk was about datamining medical data. In an effort to combine relevant data from different datasets Edwin wrote a tool to highlight these and represent them in an effective way. Edwin was followed by Wouter Beek (UVA) who held a philosophical discussion titled *The Weakness of Strong AI* in which he, among other things, emphasized the ever changing meaning of the word 'intelligent'. The next talk's subject, which was held by Nicolas Höning (VU), was a distributed framework in which agents play the non-iterated prisoner's dilemma against each other. Enhanced with the ability to gossip, agents could ask other agents if they knew their opponent was trustworthy or not. By making use of a Small World Network this idea is computationally feasible.

After the relaxing break Matthijs Melissen (UU) led us into the second half of the program. In his paper he presents a solution for the emptiness problem for associative and non-associative Lambek calculus. Eelke Spaak (RU) presented his study on *The Evolution of Mirror Neurons* in which he used evolutionary robotics-simulation techniques to show that mirror neurons evolve due to a selective pressure for imitative behaviour. Last but not least Frank Takes from the University of Leiden talked about the famous but 'hard' to solve Sokoban game. Frank tackled this 'time-consuming' problem by starting at the goal state of the game working his way back to the start state. This strategy reduces the amount of deadlocks for which you have to check, making the puzzles easier to solve for computers.

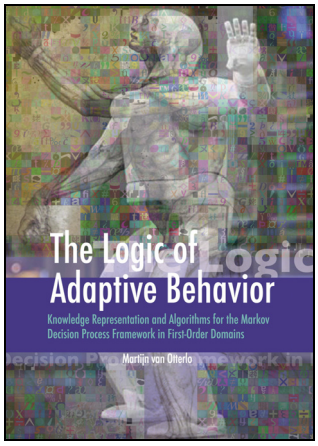
Summing things up I think everyone had a stimulating and enjoyable afternoon with high quality talks of great diversity, celebrating the richness of the artificial intelligence field. Of course the SC could not end without refreshing drinks and entertaining chats during which some of us already looked forward to the next Student Conference.

PH.D. THESIS ABSTRACTS

The Logic of Adaptive Behavior: Knowledge Representation and Algorithms for the Markov Decision Process Framework in First-Order Domains

Ph.D. thesis abstract
Martijn van Otterloo

Promotores: Prof.dr.ir. A. Nijholt, Prof.dr. J.-J.Ch. Meyer
Date of defense: May 30, 2008



Learning and reasoning in large, structured, probabilistic worlds is at the heart of artificial intelligence. Markov decision processes have become the de facto standard in modeling and solving sequential decision making problems under uncertainty. Many efficient reinforcement learning and dynamic programming techniques exist that can solve such problems. Until recently, the representational state-of-the-art in this field was based on propositional representations.

However, it is hard to imagine a truly general, intelligent system that does not conceive of the world in terms of objects and their properties and relations to other objects. To this end, this book studies lifting Markov decision processes, reinforcement learning and dynamic programming to the first-order (or, relational) setting. Based on an extensive analysis of propositional representations and techniques, a methodological translation is constructed from the propositional to the relational setting. Furthermore, this book provides a thorough and complete description of the state-of-the-art, it surveys vital, related historical developments and it contains extensive descriptions of several new model-free and model-based solution techniques.

Context-Aware Querying: Better Answers with Less Effort

Ph.D. thesis abstract
Arthur van Bunningen

Promotores: Prof.dr. P.M.G. Apers and Prof.dr. L. Feng
Date of defense: June 13, 2008

Nowadays, more and more information becomes available in digital form. To be able to guide users through this wealth of information, this thesis investigates how to adapt the provided information to the current situation (i.e., the context) of the user, by incorporating context data into database querying.

Since context data differs from ordinary data in the way that it is measured and used, several specific data management topics need to be addressed. The thesis focuses on four topics: how to keep the adaptation traceable for the user, how to deal with uncertainty in context data, how to address learning and reasoning about the context data, and how to store context data.

This results in a model in which the influence of context data on the information need of the user can be expressed through preference rules together with a score and a score-combination operation. Each rule expresses an interest of a user in a specific context.

Both context and interest are expressed using a knowledge-based approach to support reasoning and keep the rules explainable to the users. The score-combination operation comes in two flavors; disjunctive and conjunctive. Depending on the score-combination operation, the scores of the rules have a different probabilistic interpretation. It is shown how this interpretation relates to the interaction history of the user, as well as the relation to the knowledge-based framework. The model is implemented upon a traditional database using probabilistic event expressions.

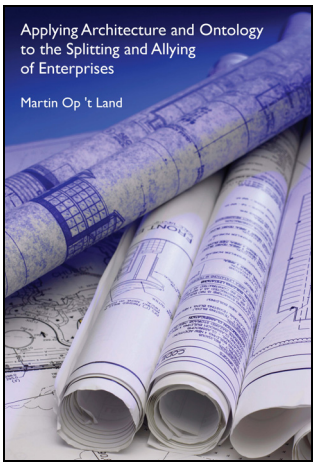
Finally, it is shown which of its assumptions a system should explain to the user to provide the user with more certainty about the answer. Two measures are introduced, based on the effect of the verification of these assumptions.

Experimental results show to which extent the scores are understandable to the users and learnable from the interaction history.

Applying Architecture and Ontology to the Splitting and Allying of Enterprises

Ph.D. thesis abstract
Martin Op 't Land

Promotor: Prof.dr.ir. J.L.G. Dietz
Date of defense: June 13, 2008

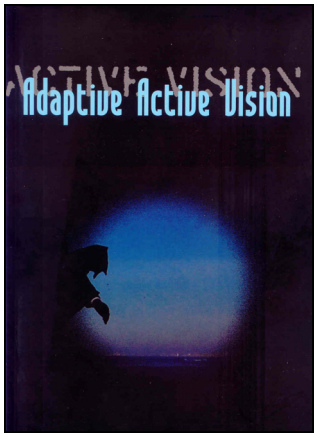


Organizations increasingly split off parts and start cooperating with those parts, for instance in Shared Service Centers or by using in- or outsourcing. What is the right spot and way for finding the organization split? And on what subjects should organizations agree to cooperate effectively across the organization split? To find managerial handles for this problem, we applied action research to four large real-life case-studies in which ontology and architecture were used. This resulted in an instrument for supporting organization splitting, allying and post-merger integration, consisting of (1) organization construction rules, (2) algorithms for calculating a plausible organization splitting proposal, (3) a method for finding subjects for contracting split organizations, and (4) a real-life tested combination of all this in a way of working with (5) a known Return On Modeling Effort (ROME). Future research should make this instrument more broadly applicable, more thoroughly tested and delivering faster decision-support, and it should clarify the mutual dependency of organization splitting versus ICT splitting.

Adaptive Active Vision

Ph.D. thesis abstract
Guido de Croon

Promotores: Prof.dr. E.O. Postma and Prof.dr. H.J. van den Herik
Date of defense: June 26, 2008



Actions are essential to visual perception. Humans and animals rely heavily on movements of their eyes, head, and body to perceive the environment in which they live. It has been shown that computer vision models can also use visual actions to improve their performance on visual tasks. However, the problem with developing such *active vision models* is that we do not know how they should determine their actions. A typical approach to this problem is to make assumptions on the vision process. For example, a main assumption is that visual actions have as goal to gather information on a predefined part of the world. Such an assumption facilitates designing an action strategy for an active vision model.

In the thesis, we employ a different approach to the problem of determining an action strategy: we *adapt* active vision models to their task. Currently, there are three main obstacles on the way towards a successful application of adaptive active vision models in computer vision. First, it is uncertain whether such models are able to cope with visually challenging tasks. Second, the manner in which the models handle visual tasks is poorly understood. Third, active vision is always associated with servo-motor systems. It is not clear whether adaptive active vision models can also improve computer vision involving static image sets. To overcome the three obstacles, we formulate the following problem statement.

Problem statement: *How do adaptive active vision models handle challenging visual tasks?*

A visual task is challenging if humans are currently still better at it than state-of-the-art computer vision algorithms. In most of the challenging tasks studied, we use a model that only processes local image samples. In our opinion, such a model is most promising for the field of computer vision; it is computationally efficient and can be applied to static images. Since the model has to direct its *gaze* to elements of interest in the visual scene, we refer to it as a *gaze control model*. We attempt to gain insight into the problem statement by answering four research questions (RQs), each in a separate chapter.

RQ 1: How does the adaptive active vision approach relate to other approaches of active vision?
RQ 2: How does a memoryless adaptive gaze control model handle an image classification task?
RQ 3: How does an adaptive gaze control model use its gaze shifts in a control task?
RQ 4: Can an adaptive gaze control model perform on a par with state-of-the-art computer vision models on the task of object detection?

We start our research in Chapter 2 by studying RQ 1: *How does the adaptive active vision approach relate to other approaches of active vision?* In the literature, there is one other main approach to active vision, which we name the *probabilistic approach*. This approach assumes that active vision is an iterative process of state estimation and action selection. The central goal of the actions of probabilistic models is to reduce uncertainty on a predetermined part of the world state. In contrast to the probabilistic approach, the *adaptive approach* makes no assumptions on the active vision process. Studies of this approach adapt a predetermined structure (such as a neural network) to optimise performance on the task. We first describe models from both approaches using the same notation. Then, we compare the active vision models with each other, by applying them to a task of 3-D object classification. The results show that the adaptive model performs as well as the probabilistic models, despite its lack of a formal action-selection framework.

In Chapter 3 we introduce a framework for the gaze control models that we use to answer the remaining three research questions (RQ 2, 3, and 4). We evaluate existing gaze control models on the basis of three requirements: local processing, task-dependency, and making no assumptions on what gaze strategy to follow. Our gaze control framework is inspired by the group of gaze control models that fulfil all three requirements. The main difference between our model and this group lies in the application of the model to visually challenging tasks. As a consequence, we use visual features that are different from the ones used by previous models.

Subsequently, in Chapter 4, we focus on RQ 2: *How does a memoryless adaptive gaze control model handle an image classification task?* To answer this question, we apply our gaze control model to the task of gender recognition in static natural images and compare it with a passive gaze control model. The active model outperforms the passive model on the task. Our analysis shows that the gaze control model shifts its gaze to image areas that are better for classification; the model optimises the information that its observations contain on the image class. By using its gaze location as a form of external memory, it can exploit multiple observations in spite of the memoryless nature of the controller.

Then, in Chapter 5 we investigate RQ 3: *How does an adaptive gaze control model use its gaze shifts in a control task?* A control task is different from a classification task, since the goal of the task is successful behaviour, not purely the gathering of information. Since it is well-known that humans' gaze shifts also serve other purposes than information gathering, we find it interesting to investigate whether an adaptive model uses its gaze shifts in a control task solely for information gathering. In particular, we apply an adaptive model to the task of car-driving in a simulator. The analysis shows that the gaze shifts of an evolved agent serve the following three functions: (1) to find relevant visual features in the beginning of a run, (2) to keep relevant visual features in sight, and (3) to avoid disruptive visual inputs. Where the first two functions concern the gathering of information from the environment, the third function does not. By avoiding disrupting visual inputs, the model obviates the need for complex internal processing of such inputs.

In Chapter 6, we turn to RQ 4: *Can an adaptive gaze control model perform on a par with state-of-the-art computer vision models on the task of object detection?* Existing object-detection methods usually perform an exhaustive scan of an image by evaluating local samples at all positions in the image either as being an object or being part of the background. We introduce a gaze control model that uses the information that local samples may contain on probable object locations. The goal of employing a gaze control model for object detection is to enhance computational efficiency, while retaining as

good a detection performance as possible. We perform experiments on a face-detection task and a car-detection task, which show that the gaze control model can perform on a par with state-of-the-art object-detection methods. Our analysis demonstrates that the gaze control model is computationally much more efficient than the other methods, but that the exploitation of contextual information leads to a reduced generality.

Chapter 7 contains the general discussion of the findings in the thesis. First, we discuss all findings in the thesis regarding the differences between probabilistic and adaptive active vision. Then, we estimate to what extent our results can be generalised to other contexts. Subsequently, we address the difference between passive vision and active vision in static images. We also discuss in what cases adaptive active vision models can contribute to the understanding of natural vision.

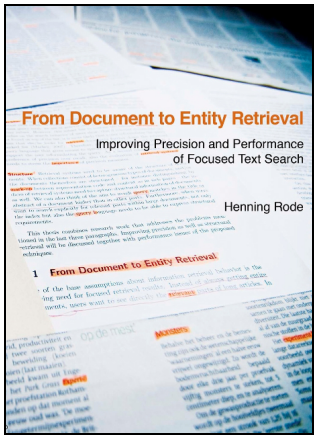
In Chapter 8, we answer the problem statement on the basis of the results. Adaptive active vision models handle challenging visual tasks by exploiting both their internal processing and their feedback loop with their environment. This feedback loop allows the models to facilitate the execution of their task. They can use the feedback loop to maximise task-specific information in their observations, by using the environment as an external memory. They can also use the feedback loop to avoid disruptive visual inputs. This obviates the need for complex internal processing of such inputs.

Finally, we may conclude that adaptive active vision is a promising approach for discovering the role of actions in vision. The approach has its restrictions and problems, but making fewer assumptions allows the models to find strategies that can both contribute to (1) a better understanding of the active vision process and (2) the improvement of computer vision techniques.

From Document to Entity Retrieval: Improving Precision and Performance of Focused Text Search

Ph.D. thesis abstract
Henning Rode

Promotor: Prof.dr. P.M.G. Apers
Date of defense: June 27, 2008



Text retrieval is an active area of research since decades. Several issues have been studied over the entire period, like the development of statistical models for the estimation of relevance, or the challenge to keep retrieval tasks efficient with ever growing text collections. Especially in the last decade, we have also seen a diversification of retrieval tasks. Passage or XML retrieval systems allow a more focused search. Question answering or expert search systems do not even return a ranked list of text units, but for instance persons with expertise on a given topic.

The sketched situation forms the starting point of this thesis, which presents a number of task-specific search solutions and tries to set them into more generic frameworks. In particular, we take a look at the three areas (1) context adaptivity of search, (2) efficient XML retrieval, and (3) entity ranking.

In the first case, we show how different types of context information can be incorporated in the retrieval of documents. When users are searching for information, the search task is typically part of a wider working process. This search context, however, is often not reflected by the few search keywords stated to the retrieval system, though it can contain valuable information for query refinement. We address with this work two research questions related to the aim of developing context-aware retrieval systems. First, we show how already available information about the user's context can be employed effectively to gain highly precise search results. Second, we investigate how such meta-data about the search context can be gathered. The proposed "query profiles" have a central role in the query-refinement process. They automatically detect necessary context information and help the user to explicitly express context-dependent search constraints. The effectiveness of the approach is tested with retrieval experiments on newspaper data.

When documents are not regarded as a simple sequence of words, but their content is structured in

a machine-readable form, it is attractive to try to develop retrieval systems that make use of the additional structure information. Structured retrieval first asks for the design of a suitable language that enables the user to express queries on content and structure. We investigate here existing query languages, whether and how they support the basic needs of structured querying. However, our main focus lies on the efficiency of structured retrieval systems. Conventional inverted indices for document-retrieval systems are not suitable for maintaining structure indices. We identify base operations involved in the execution of structured queries and show how they can be supported by new indices and algorithms on a database system. Efficient query processing has to be concerned with the optimization of query plans as well. We investigate low-level query plans of physical database operators for the execution of simple query patterns. Furthermore, it is demonstrated how complex queries benefit from higher-level query optimization.

New search tasks and interfaces for the presentation of search results, like faceted search applications, question answering, expert search, and automatic timeline construction, come with the need to rank entities instead of documents. By entities we mean unique (named) existences, such as persons, organizations or dates. Modern language-processing tools are able to automatically detect and categorize named entities in large text collections. In order to estimate their relevance to a given search topic, we develop retrieval models for entities which are based on the relevance of texts that mention the entity. A graph-based relevance-propagation framework is introduced for this purpose that enables to derive the relevance of entities. Several options for the modeling of entity-containment graphs and different relevance-propagation approaches are tested, demonstrating the usefulness of the graph-based ranking framework.

New Research Areas and Institutes

Jaap van den Herik
MICC-IKAT, Maastricht

Non Multum, Sed Multa is a well-known Latin expression, meaning in our field: stop an in-depth analysis, and start an analysis with a variety of issues. The drawback of this advice is that some researchers then have difficulties to find an appropriate title for their collection of research findings, since they have so many things to tell to the world at large. Admittedly, returning for only this reason to the world of in-depth analysis is not a sufficient reason. In particular not, since some researchers attempt to distinguish their in-depth results from those found by others, so that it again may result in a very detailed thesis title. In brief, I do not see any relation, but would like to reiterate that I prefer titles of at most five words. The reader may imagine that in this respect I am happy with our (Postma and Van den Herik) Ph.D. student Guido de Croon.

We have included three announcements of Ph.D. defences that took place earlier, one in March and two in May, but they were not published before. The other announcements of Ph.D. defences are in June or later.

To conclude, the Editorial Board would like to congratulate the new doctores with their result and wishes them much success in their future career.

Henk Herman Nap (March 18, 2008). *Stress in Senior Computer Interaction*. Eindhoven University of Technology. Promotores: Prof.dr. D.G. Buitenhuis and Prof.dr. M.A. Neerincx. Co-promotor: Dr. H.P. de Greef.

Maarten Peeters (May 19, 2008). *Solving Multi-Agent Sequential Decision Problems Using Learning Automata*. Vrije Universiteit Brussels. Promotor: Prof.dr. A. Nowé (VU Brussels). Co-promotor: Dr. K. Verbeeck (Katholieke Hogeschool Sint-Lieven).

Martijn van Otterlo (May, 30 2008). *The Logic of Adaptive Behavior: Knowledge Representation and Algorithms for the Markov Decision Process Framework in First-Order Domains*. Twente University. Promotores: Prof. dr.ir A. Nijholt (UT) and Prof.dr. J.-J.Ch. Meyer (UU). Co-promotor: Dr. M. Poel (UT). Referent: Dr. M. Wiering (RUG).

Arthur van Bunningen (June 13, 2008). *Context-Aware Querying; Better Answers with Less Effort*. Twente University. Promotores: Prof.dr. P.M.G. Apers (UT), Prof.dr. L. Feng (Tsinghua University, China). Co-promotor: Dr. M. Fokkinga (UT).

Martin Op 't Land (June 13, 2008). *Applying Architecture and Ontology to the Splitting and Allying of Enterprises.* Delft University of Technology. Promotor: Prof.dr.ir. J.L.G. Dietz (DUT).

Henriette van Vugt (June 25, 2008). *Embodied Agents from a User's Perspective*. Vrije Universiteit Amsterdam. Promotores: Prof.dr. J. Kleinnijenhuis (VU), Prof.dr. G.C. van der Veer (VU). Co-promotores: Dr. J. Hoorn (VU), Dr. E.A. Konijn (VU).

Guido de Croon (June 26, 2008). *Adaptive Active Vision*. Maastricht University. Promotores: Prof.dr. E.O. Postma (UM) and Prof.dr. H.J. van den Herik (UM).

Henning Rode (June 27, 2008). *From Document to Entity Retrieval: Improving Precision and Performance of Focused Text Search*. Twente University. Promotor: Prof.dr. P.M.G. Apers (UT). Co-promotor: Dr. D. Hiemstra (UT).

Henk Koning (September 24, 2008). *Communication of IT-Architecture.* Universiteit Utrecht. Promotores: Prof. dr. S. Brinkkemper (UU), Prof. dr. J.C. van Vliet (VU). Co-promotor: Dr. R. Bos (UU)

Krisztian Balog (September 30, 2008). *People Search in the Enterprise*. Universiteit van Amsterdam. Promotor: Prof.dr. M. de Rijke (UvA).

Rex Arendsen (October 7, 2008). *Geen Bericht, Goed Bericht. Een onderzoek naar de effecten van de introductie van elektronisch berichtenverkeer met de overheid op de administratieve lasten van bedrijven*. Universiteit van Amsterdam. Promotor: Prof.dr. T.M. van Engers (UvA).

NEW APPOINTMENTS

A new appointment need not always be a first appointment. The press release (a slightly amended version is published below) by the Tilburg University confirms this statement. Since I am involved in this press release I leave interpretations and comments to the reader. Eric Postma and myself would like to thank many of you who sent us their sincere congratulations. Thank you.

PRESS RELEASE

TiCC

Tilburg University founds Centre for Creative Computing.

Two professors to reinforce unique research institute.

An inspiring, leading scientific centre focused on research into artificial intelligence, human-computer interaction, knowledge access and discovery, and games. This is what the founders of TiCC, the Tilburg Centre for Creative Computing, have in mind. The decision to found the centre was recently taken by the Executive Board of Tilburg University in the Netherlands. The centre will be headed by Professor of Computer Science Jaap van den Herik.

The research conducted at the centre, which is to start on September 1, 2008, will be concentrated around the themes of Vision and Language. These two avenues of research will be supervised by professors Eric Postma and Antal van den Bosch. Postma, professor of Artificial Intelligence, and Van den Herik come from Maastricht University and were attracted to build the centre, together with Tilburg professor Antal van den Bosch, into an internationally renowned research institute. Van den Herik, Postma, and Van den Bosch have already worked together in various projects.

The centre is based at the Faculty of Humanities of Tilburg University, in which communication and culture are important focal points. Within this framework, the initiators are working on a number of different projects in the programmes ToKeN (knowledge access) and CATCH (Continuous Access to Cultural Heritage) of NWO, the Netherlands Organisation for Scientific Research.

The TiCC research will be centred on artificial intelligence cognitive models (perception and language processing), human-computer interaction, games and serious gaming. With the foundation of TiCC, a number of state-of-the-art research projects will be stationed in Tilburg: the development of strong computer players in traditional board games (chess, go) and in modern computer games, and the development of systems for digital analysis of paintings of, among others, Vincent van Gogh.

Combined with the already existing Tilburg research on automatic solutions for language processing (translating, conducting dialogues), the centre aims at offering a nationally and internationally unique combination of expertise. The three professors will work together on exploring knowledge and information gathered from our visual and written cultural heritage, on improving the interaction between humans and computers, and on the new domain of serious gaming, in which through interaction with artificially intelligent systems people are involved in challenging game situations that stimulate learning or behavioural change effortlessly.

A second objective of the centre is to organise events so that the general public can become acquainted with technologies developed at the centre, such as the international computer Olympiad in which computers take each other on in a series of games. The element of open competition will also be apparent in the central themes of Vision and Language: the centre will take an active part in international competitions. What system can recognize the most objects? What system yields the best translations? The centre will produce at least as many software systems as doctoral theses.

INAUGURAL ADDRESSES

With much pleasure we announce the following three inaugural addresses and a combined farewell speech.

Prof.dr. Antal van den Bosch (October 10, 2008). *Het volgende woord*. University of Tilburg, Aula, Tilburg, 16.15 hours.

Prof.dr. A.F. Harmsen (November 6, 2008). *Knowledge Management of Global Work*. Maastricht University, Aula, Maastricht, 16.30 hours.

Prof.dr. J. Scholtes (January 23, 2009). Maastricht University, Aula, Maastricht, 16.30 hours.

FAREWELL SPEECH

Prof.dr. H.J. van den Herik and Prof.dr. E.O. Postma (October 16, 2008). Maastricht University, Aula, Maastricht, 16.30 hours.

Section Editor
Richard Starmans

Summer Course Datamining in Maastricht

From August 24-29, 2008 a 5-days course on Datamining will be organized at the University of Maastricht. For all details on aims, course content, course material and location, please check: http://www.cs.unimaas.nl/datamining/.

As a result of the cooperation between SIKS and the organizers of the course, SIKS-Ph.D. students can participate without paying fee.

Participating in this course is a part of the advanced components stage of SIKS' educational program. However, the number of places available is limited. SIKS has reserved a number of places, primarily intended for those Ph.D. students working in the field of Computational Intelligence (machine learning, neural and evolutionary computing, datamining / intelligent data analysis, adaptive / self-organizing / fuzzy systems, quantitative / statistical empirical research, probabilistic reasoning / Bayesian networks, pattern and image recognition / intelligent search algorithms/games). Other SIKS-Ph.D. students are not excluded, however if the number of applicants exceeds the number of places available, the students working on the course topics come first.

REGISTRATION

SIKS-Ph.D. students interested in taking the course, should NOT contact the local organization, but send an e-mail to office@siks.nl, inform Mrs. Corinne Jolles that they want to participate and confirm in the mail that their supervisor supports their participation!

Hotel accommodation (bed, breakfast, lunch and dinner) is not part of the arrangement. Participants must make their own arrangements.

Deadline: August 1, 2008

You will receive a notification whether you can participate as a SIKS-Ph.D. student as soon as possible.

Workshop on Machine Learning and Multimodal Interaction

MLMI 2008 – 5th Workshop on Machine Learning and Multimodal Interaction. For more information, see http://www.mlmi.info.

Date: 8-10 September 2008,
Location: Utrecht, The Netherlands

Registration is now open for the fifth MLMI workshop, and the advance registration deadline is July 1st.

The workshop website has more information about invited speakers, accepted papers, venue and collocated events: http://www.mlmi.info.

The MLMI series brings together researchers from the different communities working on the common theme of advanced machine learning algorithms applied to multimodal human-human and human-computer interaction. The proceedings will appear in Springer's LNCS series, available at the workshop – the first four MLMIs are LNCS 3361, 3869, 4299, and 4892.

As a result of the cooperation between SIKS and the organizers of the workshop, SIKS-Ph.D. students can participate without paying fee. However, the number of places available is limited. For a free participation as a SIKS-Ph.D. student, please visit

the SIKS-site.

ORGANISATION

- David van Leeuwen, TNO (Organization Chair)
- Anton Nijholt, University of Twente (Special Sessions Chair)
- Andrei Popescu-Belis, IDIAP Research Institute (Programme Co-chair)
- Rainer Stiefelhagen, University of Karlsruhe (Programme Co-chair)

Workshop ECAG'08 for SIKS-Ph.D. Students

Facial and Bodily Expressions for Control and Adaptation of Games (ECAG '08)

http://hmi.ewi.utwente.nl/conference/ECAG08

Workshop organized in conjunction with the 2008 IEEE International Conference on Automatic Face and Gesture Recognition (http://www.fg2008.nl/) FG 2008

Date: September 16 (one day before the FG 2008 conference), Amsterdam

Facial and Bodily Expressions for Control and Adaptation of Games
Many interactive systems observe the human body and face and use these as a means for input. Examples are playing a boxing game using body movements, mimicking the user's facial expressions in Second Life, controlling a robot in a home environment, or adapting the teaching strategy based on the detection of frustration in a tutoring application. In these examples, observations of the face and body are used in different forms, depending on whether the user has the initiative and consciously uses his or her movements and expressions to control the interface or whether the application takes the initiative to adapt itself to the affective state of the user as it can be interpreted from the user's expressive behavior. Hence, we look at:

● Voluntary control
The user consciously produces facial expressions, head movements or body gestures to control a game. This includes commands that allow navigation in the game environment or that allow movements of avatars or changes in their appearances (e.g., showing similar facial expressions on the avatar's face, transforming body gestures to emotion-related or to emotion-guided activities). Since the expressions and movements are made consciously, they do not necessarily reflect the (affective) state of the gamer.

● Involuntary control
The game environment detects, and gives an interpretation to the gamer's spontaneous facial expression and body pose and uses it to adapt the game to the supposed affective state of the gamer. This adaptation can affect the appearance of the game environment, the interaction modalities, the experience and engagement, the narrative and the strategy that is followed by the game or the game actors.

We are soliciting papers that discuss research into this area, with a strong focus on applications. We consider the domain of entertainment, (serious) gaming and simulation. In addition to video-based observation, we also consider other means of input, including multi-modal approaches. Technical papers, as well as survey papers and empirical papers are eligible.

Authors are invited to submit papers (between six and fifteen pages), using the formatting guidelines of the main conference. Papers will be refereed by at least three reviewers. Accepted papers will appear in paper proceedings with ISSN/ISBN. Send papers to anijholt@cs.utwente.nl.

REGISTRATION

Registration is open for all FG2008 participants and for others. Registration for the workshop is free for all SIKS-PhD-students. Deadline: September 1, 2008

PROGRAMME CHAIRS AND ORGANIZERS

- Anton Nijholt (HMI, University of Twente, the Netherlands)
- Ronald Poppe (HMI, University of Twente, the Netherlands)

SIKS-day 2008 in Utrecht

On October 2, 2008, the School for Information and Knowledge Systems (SIKS) organizes its annual SIKS-day. The location will be City Castle Oudaen in Utrecht (http://www.oudaen.nl/).

The main aim of the event is to give SIKS-members, participating in research groups all over the country, the opportunity to meet each other in an informal setting and to inform them about current developments and some new activities and plans for the coming year. This year a small scientific symposium will be organized at the SIKS-day as well. Four invited speakers have agreed to perform (see the program below). By inviting these

researchers we hope to have selected the right ingredients for a memorable day. All members of our research school (research fellows, associated members and Ph.D. students) as well as the members of SIKS' Advisory Board and our alumni are invited to participate.

PROGRAM

"Creating Better Information Systems with Process Mining" *Wil van der Aalst (TU/e)*
Process mining addresses the problem that most organizations have very limited information about what is actually happening in their organization. In practice, there is often a significant gap between what is prescribed or supposed to happen, and what actually happens. As a result, information systems are not fitting or ignorant of the true processes taking place. Using process mining, it is possible to discover models that reflect what is really happening. This can be used to configure systems and to improve processes. Moreover, it is possible to measure conformance and to quantify alignment. An important enabler for process mining is the availability of event logs. In his presentation, prof. Van der Aalst will show a wide variety of real-life examples that illustrate the omnipresence of such data and the applicability of tools such as ProM.

"The State of Multi-Agent Programming" *Rafael H. Bordini (Durham, UK)*
This talk will give an overview of a particular approach to programming multi-agent systems (based on the agent platform called "Jason") and how formal verification of systems programmed according to that approach could be done. However, this will be done very briefly, simply as an attempt to situate a wider discussion of what the general state of languages and techniques for programming multi-agent systems currently is. The talk will then use this as a basis for discussing current shortfalls and future trends in multi-agent programming and verification of multi-agent programs.

Dr. Rafael H. Bordini is Lecturer in Computer Science at the University of Durham, UK. He received a Ph.D. from the University of London (UCL) in 1999, and worked as a visiting lecturer at UFRGS (Porto Alegre, Brazil), then as a research fellow at the University of Liverpool, before joining the University of Durham. Dr. Bordini has published over 60 peer-reviewed papers in journals and conferences and is best known for his work on agent-oriented programming languages, as well as his work on model checking multi-agent systems. For further details, visit http://www.dur.ac.uk/r.bordini.

"Bayesian Machine Learning: theory and applications" *Tom Heskes (RUN)*
Machine learning is about learning models from data. In so-called Bayesian machine learning we build probabilistic models and use probability calculus, in particular Bayes' rule, to infer the unknown model parameters given the observed data. In my presentation I will show where this leads to by highlighting some of the applications that we work on: brain-computer interfacing (how to control devices by reading out brain activity), functional genomics (how to use functional and structural data to unravel the life cycle of the malaria parasite), and personalization of hearing aids (how to design listening experiments that reveal the preferences of individual users).

"Retrieving Entities" *Maarten de Rijke (UVA)*
Now that document retrieval has become somewhat of a commodity, the information-retrieval community is increasingly considering tasks that revolve around entities rather than documents. Examples include product search, finding answers or locations, and profiling people or organisations. In this talk I will review some recent work on entity retrieval at the University of Amsterdam. Important building blocks for this work include named entity normalization and association finding. And prominent applications that will be discussed include expert finding and online media analysis.

The talk is based on joint work with Sisay Fissaha Adafre, Leif Azzopardi, Krisztian Balog, Maarten Marx, Valentin Jijkoun, Mahboob Khalid, and Wouter Weerkamp.

Advanced SIKS Course "Computational Intelligence"

INTRODUCTION

On October 23 and 24, 2008 the School for Information and Knowledge Systems (SIKS) will organize an Advanced Course on Computational Intelligence. The course takes two days, will be given in English and is part of the so-called Advanced Components Stage of the Educational Program for SIKS-Ph.D. students. Although these courses are primarily intended for SIKS-Ph.D. students, other participants are not excluded. However, their number of passes will be restricted and depends on the number of students taking the course. The course is given by experienced lecturers actively involved in the research areas related to the topics of the course.

Location: Conference center Woudschoten in Zeist.

SCIENTIFIC DIRECTORS

- Prof.dr. A.P.J.M. Siebes (UU)
- Dr. U. Kaymak (EUR)

PRELIMINARY PROGRAM

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

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

REGISTRATION

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

Advanced SIKS Course "Business Process Management"

INTRODUCTION

On November 6 and 7, 2008 the School for Information and Knowledge Systems (SIKS) will organize an advanced course on "Business Process Management". The course takes two days, will be given in English and is part of the so-called Advanced Components Stage of the Educational Program for SIKS-Ph.D. students. Although these courses are primarily intended for SIKS-Ph.D. students, other participants are not excluded. However, their number of passes will be restricted and depends on the number of students taking the course. The course is given by experienced lecturers actively involved in the research areas related to the topics of the course. Especially Ph.D. students working on the SIKS-focus "Enterprise Information Systems" are strongly encouraged to participate.

Location: Conference center Landgoed Huize Bergen in Vught.

SCIENTIFIC DIRECTORS

- Prof. dr.ir. W.M.P. van der Aalst (TU/e)
- Prof. dr. M.U. Reichert (Universität Ulm)

PROGRAM

More details on the program will be made available in due course.

Basic SIKS Course "Research Methods and Methodology for IKS"

INTRODUCTION

On November 24-26, 2008, the School for Information and Knowledge Systems (SIKS) organizes the annual three-day course "Research Methods and Methodology for IKS". The location will be Conference Center Woudschoten in Zeist. The course will be given in English and is part of the educational Program for SIKS-Ph.D. students. Although the course is primarily intended for SIKS-Ph.D. students, other participants are not excluded. However, their number of passes will be restricted and depends on the number of SIKS-Ph.D. students taking the course.

"Research Methods and Methodology for IKS" is relevant for all SIKS-Ph.D. students (whether working in computer science or in information science). The primary goal of this hands-on course is to enable these Ph.D. students to make a good research design for their own research project. To this end, it provides an interactive training in various elements of research design, such as the conceptual design and the research planning. But the course also contains a general introduction to the philosophy of science (and particularly to the philosophy of mathematics, computer science and AI). And, it addresses such divergent topics as "the case-study method", "elementary research methodology for the empirical sciences" and "empirical methods for computer science".

"Research Methods and Methodology for IKS" is an intense and interactive course. First, all students enrolling for this course are asked to read some pre-course reading material, comprising some papers that address key problems in IKS-methodology. These papers will be sent to the participants after registration. Secondly, all participants are expected to give a brief characterization of their own research project/proposal**,** by answering a set of questions, formulated by the course directors, and based on the aforementioned literature.

COURSE COORDINATORS

Hans Weigand (UvT), Roel Wieringa(UT), John-Jules Meyer(UU), Hans Akkermans(VU), and Richard Starmans (UU)

PROGRAM

A provisionary program is not available yet. More details will be made on the SIKS-site in due course.

REGISTRATION

For registration you are kindly requested to fill in the registration form at the SIKS-website In the conference center there is a limited number of places and there is interest from other groups in the topic as well. Therefore, an early registration is required.

Deadline for registration for SIKS-Ph.D. students: November 1, 2008

ANNOUNCEMENTS

Call for Papers: MLDM 2009

6th International Conference on Machine Learning and Data Mining

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

OBJECTIVES AND TOPICS

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

Paper submissions should be related but not limited to any of the following topics: association rules; applications of clustering; applications in medicine; aspects of data mining; automatic semantic annotation of media content; Bayesian models and methods; conceptional learning and clustering; case-based reasoning and learning; classification and interpretation of images, text, video; classification and model estimation; case-cased reasoning and associative memory; content-based image retrieval; decision trees; deviation and novelty detection; ensemble methods; feature grouping, discretization, selection and transformation; feature learning; frequent pattern mining; high-content analysis of microscopic images in medicine, biotechnology and chemistry; goodness measures and evaluation (e.g., false discovery rates); inductive learning including decision-tree and rule-induction learning; knowledge extraction from text, video, signals and images; learning/adaption of recognition and perception; learning of internal representations and models; learning of appropriate behaviour; learning of action patterns; learning in image pre-processing and segmentation; learning and adaptive control; learning robots; learning in process automation; learning for handwriting recognition; learning of semantic inferencing rules; learning of ontologies; learning of visual ontologies; mining gene data bases and biological data bases; mining images, temporal-spatial data, images from remote sensing; mining text documents; mining structural representations such as log files, text documents and htm-documents; mining financial or stockmarket data; mining images in computer vision; mining images and texture; mining motion from sequence; network analysis and intrusion detection; neural methods; nonlinear-function learning and neural-net-based learning; organisational learning and evolutional learning; probabilistic information retrieval; rule induction and grammars; retrieval methods; real-time event learning and detection; selection bias; sampling methods; selection with small samples; similarity measures and learning of similarity; statistical learning and neural-net-based learning; support-vector machines; subspace methods; statistical and conceptual clustering methods: basics; statistical and evolutionary learning; speech analysis; symbolic learning and neural networks in document processing; time series and sequential pattern mining; text mining; visualization and data mining; video mining.

CONFERENCE CHAIR

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

IMPORTANT DATES

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

Authors can submit their papers in long or short version.

Long Papers

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

Short Papers

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

Please submit the electronic version of your camera-ready paper through the COMMENCE conference management system. If you have any problems with the system please do not hesitate to contact info@mldm.de.

CONFERENCES, SYMPOSIA WORKSHOPS

JULY 15-19, 2008
PETRA'08: the 1st International Conference on Pervasive Technologies Related to Assistive environments, Athens, Greece.
http://www.petrae.org

JULY 21-25, 2008
ECAI 2008: the 18th Biennial European Conference on Artificial Intelligence, Patras, Greece.
http://www.ece.upatras.gr/ecai2008

JULY 21-25, 2008
MobiQuitous 2008: the Fifth Annual International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services, Dublin, Ireland.
http://www.mobiquitous.org

AUGUST 13-15, 2008
GAME-ON: North America 2008, McGill University Montreal, Montreal, Canada.
http://www.eurosis.org/cms/?q=taxonomy/term/119

SEPTEMBER 4-6, 2008
AIMSA 2008: the 13th International Conference on Artificial Intelligence: Methodology, Systems, Applications, AI@work, Varna, Bulgaria.
http://www.aimsaconference.org

SEPTEMBER 10-12, 2008
HIS 2008: the 8th Hybrid Intelligent Systems Conference, Technical University of Catalonia, UPC Barcelona, Spain.
http://his2008.lsi.upc.edu

SEPTEMBER 10-12, 2008
DIMEA 2008: 3rd ACM International Conference on Digital Interactive Media in Entertainment and Arts. Athens Information Technology (AIT). Athens, Greece.
http://www.dimea2008.org/

SEPTEMBER 16, 2008
ECAG'08: Workshop on Facial and Bodily Expressions for Control and Adaptation of Games; and FG2008: the 2008 IEEE International Conference on Automatic Face and Gesture Recognition, Amsterdam, The Netherlands.
http://hmi.ewi.utwente.nl/conference/ECAG08
http://www.fg2008.nl

SEPTEMBER 18-20, 2008
IDC'2008: 2nd International Symposium on Intelligent Distributed Computing, Catania, Italy.
http://idc08.diit.unict.it

SEPTEMBER 23, 2008
KI 2008 Conference; 3rd Workshop: Emotion and Computing – current research and future impact. Kaiserslautern, Germany.
http://www.emotion-and-computing.de

OCTOBER 22-24, 2008
AIIDE: the Fourth Conference on Artificial Intelligence and Interactive Digital Entertainment, Stanford University, Palo Alto, CA, USA.
www.aiide.org

OCTOBER 26-30, 2008
ISWC2008: 7th International Semantic Web Conference, Karlsruhe, Germany.
http://iswc2008.semanticweb.org

OCTOBER 30-31, 2008
BNAIC 2008: the 20th Belgian-Dutch Conference on Artificial Intelligence. Bad Boekelo (near Enschede), The Netherlands.
http://hmi.ewi.utwente.nl/bnaic2008

DECEMBER 10-13, 2008
JURIX 2008: the 21st International Conference on Legal Knowledge and Information Systems. Florence, Italy.
http://www.ittig.cnr.it/jurix08

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

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