AI@Rug Newsletter

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Elsevier: AI@Rug weer op 1!

In de jaarlijkse enquête van het weekblad Elsevier komt de **AI@Rug** bacheloropleiding Kunstmatige Intelligentie van de Rijksuniversiteit Groningen voor het tweede opeenvolgende jaar als beste uit de bus van alle landelijke universitaire KI-opleidingen.

Deze uitkomst is gebaseerd op het oordeel van studenten over een hele lijst van punten betreffende het onderwijs. In alle hoofdgroepen (faciliteiten, inrichting opleiding, onderwijs, docenten, toetsing, organisatie & communicatie) eindigde **AI@Rug** bovenaan. Een prachtig resultaat!

www.elsevier.nl/bestestudies2010

Fokie Cnossen FWN docent van het jaar

Op vrijdag 10 december werd de Facultaire Onderwijsprijs uitgereikt. Van de ca. 300 docenten bij FWN zijn **AI@Rug** docent **Fokie Cnossen** en wiskunde-docent Jaap Top uitgeroepen tot beste docenten van het jaar. Onder de twaalf genomineerde docenten zagen we ook **AI@Rug** docent **Arnold Meijster**. Het was de tweede keer dat een **AI@Rug** docent deze prijs won: vorig jaar won **Rineke Verbrugge**. Omdat **AI@Rug** nog maar 2 keer heeft meegedaan bij FWN, betekent dit dat **AI@Rug** nu een 100% score heeft.

Robocup@home on British television

AI@Rug member **Tijn van der Zant** was one of the organizers of the yearly RoboCup@Home event in Singapore. The RoboCup@Home league aims at the development of assistive and service robot technology. This year there were 24 participants from 17 countries, one of the participants being the "Radical Dudes", a joint team of **AI@Rug** and INSERM in Lyon.

Tijn van der Zant at robocup@home

The "Radical dudes" reached ninth place, and among the new teams it came in second. The Radical Dudes is the first team ever to participate with a full humanoid robot. An item about RoboCup@Home was presented on the British Gadget Show on channel 5 and is available online.

Next year, an **AI@Rug** team will participate with the Nao humanoid robot which will be mounted on a Pioneer robot to increase its size and speed. The team will participate in 2 local competitions for training (in Germany and Iran) and at the world championships in Istanbul. The team will not only focus on typical robot technologies such as navigation and manipulation, but also on 'mental' capabilities such as understanding and reasoning about what the human user wants.

www.robocupathome.org

Lambert Schomaker speaks at the Smithsonian Institute

Invited by the NWO, **AI@Rug** prof. **Lambert Schomaker** gave a lecture at the Smithsonian Institute in Washington on December 14, together with a selection of Dutch scientists and representatives of the cultural heritage institutions. NWO and NSF intend to develop a joint 'Science4Arts' initiative to generate new possibilities for research grants in conservation science. An audience of about 100 researchers conservators and curators of the Smithsonian Institute attended Lambert Schomaker's lecture on the new Monk algorithms for handwriting recognition and the unique huge infrastructure that is now under development in the Netherlands.

New projects in the Auditory Cognition group on the subjective experience of sound

The Auditory Cognition group has two new projects. Both projects aim at practising cognitive science in the real world, and both should lead to direct societal benefits as well as fundamental scientific advancement.

The first project is a ZON/MW financed PhD project aimed at the auditory sensitivity of mentally handicapped people. Former **AI@Rug** bachelor student **Nienke van Tellingen**, who already had a master's degree in Psychology, applied and she was selected! More than 50% of our master's degree graduates successfully apply for a PhD-position somewhere, but Nienke is the first AI bachelor student to successfully

apply for a PhD position! Nienke will work at the Faculty of Behavioral Sciences in the department of Orthopedagogy under de daily supervision of Prof. Carla Vlaskamp. The ultimate goal of this project is to improve the auditory environment of mentally handicapped people and in doing so improve their well-being and quality of care. The optimization of the auditory environment of mentally handicapped people has never really been investigated, and fears are that they live in an auditory environment that is suboptimal (or worse). This situation requires improvement because many severely mentally handicapped people have impared vision and are very reliant on sound. Furthermore they are unlikely to understand their auditory environment well. From a purely fundamental science perspective, the project might allow us to study hearing (sound based orienting) and listening (knowledge guided analysis) with persons whose hearing might be near normal but whose strategic component of listening is severely limited. This is truly undiscovered scientific territory.

The second project was funded and requested by the province of Drenthe. In this project **AI@Rug** member **Jolie Lanser** will investigate the fundamentals of sound annoyance. The aim is to set up a web-based questionnaire through which people who are highly irritated by certain sounds can report from all over the world on their annoyance and on how the irritating sound is influencing their life, health and happiness. The scientific purpose of the questionnaire is to prove (or disprove) that 1) the process of becoming annoyed is a normal process that can happen to most of us and 2) that audible sound sources and not necessarily loudness annoy people. We work with a number of groups of highly sound-annoyed people in a number of countries. We might end up in a situation in which we provide the questionnaire in many different countries and languages. Eventually we might collaborate with researchers in a large number of countries and with sufferers of a wide range of different sound sources. The ultimate aim of this research is to provide guidelines to improve sonic environments and to ultimately improve well-being. Just as in the previous project we expect to benefit in terms of fundamental science as well: We might discover new hearing related facts that cannot be uncovered easily in laboratory conditions, but that could be discovered by using the world as our laboratory.

Sonja Smets' projects on the move

AI@Rug member **Sonja Smets** has been traveling around the world to talk about her research.

Together with her regular co-author Alexandru Baltag, she gave a keynote lecture on 'Doxastic Attitudes and Norms for Interactive Belief Change' at the NIP-Copenhagen Formal Epistemology Workshop. Sonja gave another keynote lecture 'Quantum Logic in Action' at the 3rd International Workshop on Physics and Computation in Egypt. This trip was a highlight. She reports: "The workshop was held on a boat. A social program, including a hieroglyphics class was arranged in the morning and a conference in the afternoon while sailing between Aswan and Luxor."

Sonja's group is also growing. **Jort Bergfeld** joined **AI@Rug** to perform his PhD research in the quantum logic project.

www.sonjasmets.nl

Generative AI; PhD defense Tijn van der Zant

On September 24, **AI@Rug** member **Tijn van der Zant** successfully defended his dissertation 'Generative AI: a neo-cybernetic analysis' that he wrote under the supervision of **Lambert Schomaker**. Tijn's research is inspired by the idea that today machines mostly display the cleverness of their designers, whereas real artificial intelligence will require that machines are capable of developing their own intelligence to new levels. Such automatic 'scaffolding' of machine intelligence is the topic of the thesis. Tijn proposes abstract mechanisms behind the automated scaffolding of intelligence, and addresses the problems of automatic recognition of historical cursive script and the development of home-robotics applications.

The context of sound; PhD defense Maria Niessen

On October 22, **AI@Rug** member **Maria Niessen** successfully defended her PhD thesis entitled 'Context-Based Sound Event Recognition'. In her research, Maria investigated the influence of context on the recognition of sound events. She developed a sound event recognition system that made use of context. A model that made use of context was shown to better classify sound events than a model that did not make use of the context. **Lambert Schomaker** was Maria's promotor and **Tjeerd Andringa** was her co-promotor. Maria Niessen is currently working as a post-doc at the Cognitive Sensors Group at INCAS3 where her focus is on categorization of sound events.

http://www.rug.nl/ai/nieuws/promotie_maria

Defense Maria Niessen

Sound recognition in uncontrolled environments; PhD defense Dirkjan Krijnders

On October 29, **Dirkjan Krijnders** successfully defended his PhD thesis entitled 'Signal-driven sound processing for uncontrolled environments'. In his research, Dirkjan investigated how sound-recognition can be applied in uncontrolled environments. He developed tools for sound recognition that make use of sound object formation. **Lambert Schomaker** was Dirkjan's promotor and **Tjeerd Andringa** was his co-promotor. Dirkjan Krijnders is currently working as a post-doc at the Cognitive Sensors Group at INCAS3 where his focus is on annotation and automatic recognition of sounds.

www.rug.nl/ai/nieuws/promotie_dirkjan

Defense Dirkjan Krijnders

Massive storage infrastructure in Groningen for historical handwritten manuscript collections

The APS group is participating in the multidisciplinary Target project which is focused on e-Science, high-performance computing and massive storage. The goal is to build 10 petabyte of disk space (30 church towers or 'Martinitorens' of piled DVD disks) and allow super-computer access to it. One PB is one-thousand terabytes or a million gigabytes. The Monk system for Googling in handwritten image collections makes use of this platform which was installed by IBM. Prof. **Lambert Schomaker** gave a television interview for the ICTregie organisation on the occasion of the delivery of the first 1.5 PB in the CIT center.

www.ictregie.nl

Session on Cognitive Models for Neuroimaging Data

Ronald van Elburg and **Niels Taatgen** are organizing a session on Cognitive Models for Neuroimaging Data, to be held at the 9th Dutch Endo-Neuro-Psycho Meeting in Lunteren on May 31, 2011. The Dutch Endo-Neuro-Psycho Meeting is organized by the Dutch Neurofederation and offers a national and international platform for endocrinology, molecular and cellular neuroscience, and cognitive and behavioral neuroscience. Traditionally the program contains many renowned scientists.

Until recently, cognitive models mainly predicted task performance and response times in cognitive tasks, but now we see a rise in the use of these models to predict fMRI and ERP data. Comparison of fMRI data with cognitive models has confirmed and further refined our view on the localization of specific cognitive functions to specific brain areas. fMRI excels at localizing neural activity whereas ERPs have excellent temporal resolution. Because many cognitive models implicitly model the timing of neural processes underlying behavior, these models seem ideally suited for modeling ERP's which reflect these neural processes. The session in Lunteren aims at presenting an impression of both the current state of the art in cognitive modeling of fMRI-data and of the first results in the now emerging field of ERP modeling.

Brad Wyble (New York), Birte Forstmann (Amsterdam), **Jelmer Borst** and **Marieke van Vugt** will speak at the session.

enpmeeting.org/2011

Professor M. Embrecht at AI@Rug colloquium

On December 15 Prof. Mark Embrecht of the Rensselaer Polytechnic Institute presented a talk at the **AI@Rug** colloquium entitled: "Are artificial neuron networks still relevant for pattern recognition? The promise of reservoir computing". He started his talk with an excellent introduction to the history of neural networks, and then arrived at Minsky's connectedness problem. This problem features a grid with cells where the cells can be active or inactive, and the classification problem is to tell if there is a connected line going from top to bottom or from left to right. According to the current theory, this problem cannot be fully solved with conventional neural networks. Then Prof. Embrechts related on his own research in which he applies reservoir computing for static classification problems. Reservoir computing is a kind of recurrent neural network technique that has been used successfully in a variety of time-series problems. The novelty that Mark showed was that they could also be applied quite successfully to static classification problems. Mark ended his talk with information about his future work with chaotic complex neural networks.

New people at AI@Rug

In December, **Marieke van Vugt** joined the Cognitive modeling group of **AI@Rug** as assistant professor (tenure track). In November, **Harmen de Weerd** started his PhD research in **Rineke Verbrugge**'s VICI project 'Cognitive Systems in Interaction'. In October, **Tijn van der Zant** returned as a teacher after spending some time at INSERM in Lyon. Also in October, **Jean-Paul van Oosten** started work as a new scientific programmer in **Lambert Schomaker**'s Target project. As of last summer, **Marco**

Wiering is supervising two new bursary PhD students: **Olarik Surinta** and **Faik Karabaa**. From August to December, **Bea Lip** supported the administrative staff of **AI@Rug**.

Afgestudeerden

Propedeuse diplomas

Ben Wolf, Laura Baakman, Inge Doesburg, Christofoor Oost, Manon de Vries, Josje van Lunteren, Marten Schutten, Alex van de Bie, Rik Smit, Henk Borghols, Peter Jan Haga Maaike van de Wetering, Ayla Kangur, Christine Lemstra, Peter Smit, Joël Kuiper

Bachelor diplomas

Bas Hickendorff
Jefta Saija
Fransje van Weerden
Thijs Kooi
Hans Alves
Wiard Jorritsma
Nienke van Tellingen
Hielke Prins
Atser Damsma
Marco Doornbos
Romke van der Meulen
Christine Lemstra
Klaas Jacob de Vries

Master diplomas

Auke Dirk Pietersma
Feature space learning in Support Vector Machines through dual objective optimization

Herman Eldering
Classification of rodent behavior using seismic signals.

Tom van der Kleij
Monte-Carlo tree search and opponent modelling through player clustering in no-limit Texas hold'em poker

Jean Paul van Oosten
Can Markov properties be learned by hidden Markov modeling

Lude Feldbrugge
Using Reinforcement Learning to Make Optimal Use of Available Power and Improving Overall Speed of a Solar-Powered Boat

Harmen de Weerd
Evolution of altruistic punishment in heterogeneous populations

Allard Veenstra
Sound recognition: a cognitive way

Auke Klazema
Towards a fast spelling device for a brain computer interface: the quest for a third signal source in the EEG

Wendy van Thiel
Optimize learning with reaction time based spacing by modifying the order of items in a learning session.

Erwin Scholtens
Evolution of self-organised division of labour in social insects

Richard Berendsen
Movie rewards: do words add up to a sentiment?

Willem Stuursema
The influence of loading delays on the use of ABN AMRO web site

Max Jensch
Assessing the effects of different input modalities or error recovery

Coen van Leeuwen
Driver modelling and lane change maneuver

Wouter Klijn
Single spiking and bursting activity in a three layer Liquid-state network.

Colophon
AI@Rug Newsletter is a newsletter for students and staff members of the department of Artificial Intelligence of the University of Groningen. The archive of the newsletter can be found at *www.ai.rug.nl/newsletter*. You can be added to the mailing list by sending a message to Hanneke Niessink (J.H.Niessink@rug.nl).

Redactie:
Bart Verheij, **Bea Valkenier**, **Hanneke Niessink**, **Lambert Schomaker**.