

## Interview with Janet Veldstra

# Illicit drugs and traffic safety

**My name is Janet Veldstra. I studied psychology here in Groningen and after that I applied for a Ph.D. position on the influence of illicit drugs and medicines on driving. My project is part of a European project, DRUID. I have now been working on my project for three and a half years, so I'm almost finished.**

### **Can you tell us a bit about yourself and your research?**

Within the project we directly study the effects of drugs on driving. So, instead of the epidemiological method of looking at the population and seeing how often people under the influence of drugs are involved in car accidents, we administer drugs to people, and study their behaviour in a driving simulator. We then compare the results with how people drive while under influence of alcohol. Therefore, we first performed a study into driving under influence of alcohol at different alcohol levels of 0.3, 0.5 and 0.8, where 0.5 is the legal limit in most countries and 0.8 in some states of the USA. Now we can compare these data to how people drive under influence of XTC, marijuana or Marinol (medicinal marijuana). Then we can say whether it's comparable to the legal limit for alcohol, or maybe higher or lower. In the case of alcohol, there are laws that state a limit for how much alcohol in your blood is allowed, and basically when it comes to drug use in traffic, you would want similar limits.

I study this using a driving simulator, where we look at different behaviours that indicate how well people are able to drive a car, like swaying behaviour, driving speed and changes in driving speed. What we typically see is that people that have drunk alcohol start to sway more across the lane. When it comes to alcohol, but also other drugs and sleepiness, we also see that people start to vary their speed more, in order to keep themselves focused, so you find an increased standard deviation of the speed. If people are under the influence of XTC, they are more focussed, and what you see then is that they drive very straight and at a constant speed.

### **XTC is still one of the most popular recreational drugs**

Besides these fairly direct behaviours, we look at interactions with other traffic participants, such as how well they behave according to traffic rules: How often do



they ignore red traffic lights, do they give right of way, how do they react if someone else violates traffic rules - most people become angry, even though it is a simulation - and we look at how long people wait if they have to intersect a long row of cars that have right of way. In this latter case, there is some sort of threshold. You don't want to wait for too long, but you also don't want to take too big a risk when there's not enough space between the cars. This is a very good measure for determining risk taking behaviour. So, we look in different ways at driving behaviour and we compare that to how it is under influence of alcohol.



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***So, your last study was into effects of XTC on driving. Can you tell us a bit more about that?***

We studied XTC, because today it is still one of the most popular recreational drugs in Europe after cannabis, which is the number one drug in Europe. According to recent figures, approximately three percent of the European population says that they have used XTC during the past year. Besides this, there are indications that people who use the drug often go to parties outside their home towns and cities, and they go there by car. From epidemiological research we have evidence that some people are driving under influence of XTC and other drugs like speed.

***I had the feeling that I got a new best friend***

XTC is a drug that makes you very cheerful and it makes you feel very empathic towards other people, which I've noticed during my study. Even though the study itself was double blind, so up front I didn't know when people had had XTC, often I could notice that they had had it. Some participants grinded their teeth, or started sweating, some got overly talkative. But what I thought was really special was that some participants would get very open and personal with me. At the end of the day I sometimes had the feeling that I got a new best friend. You could say that this happened because I am such a nice person, and maybe that's true, but I felt that this was different from other lab studies that I did. During the alcohol study that I did before, for example, I could usually notice if participants had had alcohol because the participants tended to get more talkative but not in the way as with XTC. There I found that people became more intimate towards me.

***Can you give us some preliminary results of your XTC study?***

Well, as was found before in previous research we also found that on the swaying measure that I mentioned earlier, people start to drive more straight; even more straight than people that haven't used any drugs. This is in sharp contrast with driving under influence of alcohol, when you always see bad scores. However, we also tested the combination of XTC and alcohol. Here the participants had a blood alcohol level of 0.5 in combination with XTC. What you see then is that on the swaying measure they perform better than people who have only had alcohol, but not as good as people that are not under influence of anything. So, there's an interaction between alcohol and XTC, but XTC is not able to fully take away the effects of alcohol. So saying: "Well, I drank alcohol, so now I have to swallow a pill and I will be driving fine!", that is not entirely true.

As I said, we also looked at other measures, such as risk taking behaviour. For now I haven't found a lot, but I have to do some more analyses. It could be that people under influence of XTC take bigger risks while driving, but I can't really say much about that for now.

***You have been on TV in the TV program Nieuwslicht with your study. What was that like and how did it go?***

Well, they approached us very early on in the project. Back then we weren't ready for it, it took quite a while before we could start the experiment, because we had to fill out a lot of forms, which of course is obvious because you need permits for everything. That is completely understandable because of course you cannot just give people drugs and start an experiment. That would be unethical. However, sometimes it was extremely difficult to work around standard procedures

that applied for medicinal research but were not suitable for illicit drug research. This often led to these Catch-22 like situations, in which you needed to have permits in order to get other permits but needed the former permit to get the latter etc. As you can imagine, that can take a lot of time. So the first time when the people of Nieuwslicht contacted us, we said "no". But they kept insisting, so a year later they called us again and we said "OK".

***They managed to get some XTC delivered via an express courier***

Menno Benveld, the host of the show, had brought his own XTC and used our driving simulator to make the item. I thought it was funny that when he came in the morning of the shooting it appeared that he had taken the wrong drug with him - speed instead of XTC - but this was television so they rapidly managed to get some XTC delivered via an express courier, so he could take the right drug for the item. He took the drug and came to the faculty a bit later to drive in our simulator. It was really funny to see him under influence and I think they made a nice item.

***What drives you in your research?***

I wanted to become very rich, but I now realize that I picked the wrong job for that goal [she laughs]. No, what I like in this research is that we try to do fundamental research into the influence of drugs on performance, however, against the practical background of the EU project that we're working for, where the goal is to create laws and regulations in order to make driving safer. I think that for me discovering how things work combined with practical goals is very satisfying. That's the nice thing about applied psychology.

Of course it is also very exciting to do research with a drug like XTC. Everybody has an opinion on drugs, so it leads to a lot of nice conversations and discussions. I have noticed that most people think that it's fine when people drink alcohol, but when it comes to recreational drug use, people usually find it unacceptable. I find that interesting. In a more scientific sense, it is interesting for me that there is still a lot to learn about the effects of several kinds of drugs on behaviour and performance. Why, for example, the variation in effects is so large. On some people a drug like XTC has a huge influence, while for others it's not noticeable. There's a lot to discover and I find that very fascinating.

***You're now almost at the end of your Ph.D. Do you know what you will do next?***

What a nasty question! I have no idea! I will see what the future holds in store for me, I am open to all options.

DRUID: <http://www.druid-project.eu>

Nieuwslicht episode: <http://bitly/c9Y2qd>

■ LÉON FABER

## Twitter your way through science?

After Hyves, Facebook, LinkedIn and Twitter are new features of daily communication. Twittering has become a prominent medium in daily life, which is often done with advanced mobile telephones. It clearly fulfills specific needs of politicians and celebrities. It is an interesting question whether science also benefits from this phenomenon. Obviously political and scientific networks are very important in science, and neuroscience organizations are actively twittering at sites like <http://twitter.com/neurosciencenew> and <http://www.twibes.com/neuroscience/twitter-list> which feature opinions and all sorts of contacts. National science organizations including VNSU (<http://twitter.com/deVSNU>) and Nuffic (<http://twitter.com/NufficBlog>) twitter happily on national and international news.

Also our local organizations like the UMCG (<http://twitter.com/cmbUMCG>) and the University Journal ([http://twitter.com/UK\\_](http://twitter.com/UK_)

Groningen) twitter their practical announcements. Our future rector magnificus twitters albeit primarily on economics matters.

It may thus be time for BCN to start twittering, and I wonder whether twittering would help to promote the BCN Research Master and might be a manner to evaluate PhD courses or might serve as a means to perform opinion polls on general subjects concerning BCN.

Time will tell whether twittering proves a stable and useful medium to perform BCN communication and if BCN members are active 'followers' but an experiment might be interesting.

[http://www.rug.nl/corporate/nieuws/opinie/2010/opinie38\\_2010](http://www.rug.nl/corporate/nieuws/opinie/2010/opinie38_2010)

■ PROF. ERIK BODDEKE

## Fundraiser

### The benefit dinner for the Avril McDonald fund

#### THE AVRIL MCDONALD FUND

Avril McDonald was one of the Rosalind Franklin Fellows of our university who passed away unexpectedly on 15 April 2010. Avril possessed all qualities and talents of a Rosalind Franklin Fellow, specifically excellence in research and teaching, and inspiring a passion for knowledge.

To commemorate Avril's life and achievements, her colleagues and the Rosalind Franklin Fellows (among which there were many BCN members) have established a fund under her name. The Avril McDonald Memorial Fund is now governed by the Ubbo Emmius Fund. Through this fund, dedicated to Avril's memory, each year a female student will be given a one-year support for studying and carrying out research at the University of Groningen.

#### THE BENEFIT DINNER

To start the fundraising for the fund, a benefit dinner took place on 3 September 2010, at the Café de Sleutel.

The event was very well organized (a special thanks to the organizers: Sabrina Corbellini, Maria Antonietta Loi, Monika Schmid, Jeanne Mifsud-Bonnici, with help from Petra Rudolf). There were more than 60 attendees. The evening started off with cocktails and proceeded with a delicious menu of Italian dishes, accompanied by a fun musical performance by Opera Extravaganza. At the end, even one of the guests showed his musical talents. In a tombala, most enjoyable gifts were given away, ranging from massage therapies to free dinners.

The dinner was, in every aspect, a win-win situation: The attendees not only had a good time with a great meal and entertainment, but they also had the chance to get to know fellow colleagues from the university and the opportunity to contribute to a great cause. The evening's success of raising 3000 Euro was also due to very generous donors: the Café de Sleutel sponsored with a substantial rebate on the costs



and an anonymous donor sponsored all the musical entertainment. The fundraising dinner will be organized in the future regularly, always on the Friday preceding the opening of the academic year. Please consider participating and giving yourself the chance to have a great time.

■ DENIZ BAŞKENT

**BCN PhD-day | 22-09-2010**

# !!! OUT OF THE BOX !!!

**Day in, day out we struggle to make our projects a success. This requires hard work, long hours, dealing with disappointments that nobody else cares about, boring meetings and a to-do-list filled with annoying little tasks that cannot be ignored even though we try to. In order to get out of the daily routine and spice up our work a bit the PhD-day 2010 was initiated. It was a day where everything was just a little out of the ordinary. A day to go beyond the boundaries of traditional research and look at your project from a different perspective, to end up refreshed and motivated to tackle the daily hassles.**

The day started with a cultural break brought to us by RuG Poet 2009-2010 Sacha Landkroon. He gave us a passionate performance of his interpretation of Out of the Box. The poem titled A Dustland Fairytale: a poetic lesson about reality and delusion took us on a journey to treasures, borders and dreams. Take-home message: We create the world as we know it.

Next in line was our true out of the box Keynote Speaker Pek van Anandel, with a lecture on serendipity. You might remember this phrase from the designated romantic comedy. Yesterday I happened to see the commercial on television, where two soulmates accidentally meet. What a coincidence. Accordingly, a translation of serendipity is "the art of making an unsought finding". Mr Pek van Anandel is a true expert on this topic and gave us a nice demonstration, theoretical background and a lot of famous examples of serendipity. Of particular interest was the advice to dedicate time, space and resources to "free personal research" or hobby projects. Although unfortunately there was no microphone present in the room, when our speaker warmed up there was absolutely no need for one. Even though in his excitement he sometimes interleaved his English presentation with Dutch sentences, he kept the audience under his spell. Without our intervention, most probably they still would have been at this very moment.

**'When you run into something interesting, drop everything else and study it!'**

B.F. Skinner Am. Psychol. 1956, 11, p. 221

After a short break without coffee, sincere apologies for that, our programme continued with one out of the three workshops: Serendipity at work (drs. Pek van Anandel), Developing a talent for science (Prof. Ritsert Jansen) and Business flirting (Studio Flux). In the workshops PhD students could learn how to 1) generate out of the box research questions and interpretations of results, 2) develop skills related to research and recognizing strengths and weaknesses and 3) how to communicate out of the box results. There were on average 10 students per workshop, creating the possibility for personalized feedback. The workshops were a great success, as they received an average rating of 3.6 on a 4 point scale. Unfortunately, all three of them took a little longer than expected. Therefore the plenary discussion on out of the box topics was shortened and did not work out entirely as planned.



Serendipity at work

» **Tip**

Prof. Ritsert Jansen wrote a very interesting booklet on developing a talent for science. It will be published in the nearby future!

# BCN-BRAIN

**BCN-BRAIN is the research institute that brings together neuroscience research in the UMCG.**

In the past, the BCN-BRAIN was named BCN-FMS. In January 2005, the Faculty of Medical Sciences (FMS) merged with the Academic Hospital Groningen (AZG) to form the University Medical Center Groningen (UMCG). This UMCG Research Institute was renamed BCN-BRAIN, with BRAIN standing for "Brain Research and Integrative Neuroscience". BCN-BRAIN is strongly affiliated with the interfaculty research school BCN, but is an autonomous entity that brings together all BCN researchers in the UMCG. The PhD curriculum is organized by the interfaculty research school BCN, as is the research master. All other aspects of management and science policy regarding neuroscience in the UMCG are directly managed by BCN-BRAIN.

In December 2009, an international peer-review committee visited us, and evaluated our research for the period of 2003-2008. Besides a review of past performance, they reviewed strengths, weaknesses, threats and opportunities. In their evaluation, the committee stated that they were "impressed with what has been achieved over the past six years. We see an institute with a lot of potential at the scientific and educational level, opening up manifold opportunities to improve quality even more. It is clear that changes and reorganisation took place in response to the previous assessment."

The committee concluded that more focus and integration should be achieved within and between several research programmes. Indeed, they proposed that the overall theme "Healthy Ageing", which will guide the research strategy adopted by the university hospital in the near future, is an opportunity to reach such a shared denominator for all groups within the institute.

The committee was also impressed by the balanced PhD programme offered by BCN. They suggested further improvement through implementation of a PhD registration and follow-up system and were happy to learn that this is currently in development.

Overall, we can conclude that the quality and quantity of research of BCN-BRAIN has steadily improved over the past years, with several lines of research operating at the international forefront. We look forward towards a challenging and exciting future.

Prof. G.J. ter Horst was the director of BCN-BRAIN until 2007. I took over then, and stepped down this summer. As of September 1, 2010, Prof. H. Kremer (Neurology) will be the director of BCN-BRAIN.

■ PROF. ANDRÉ ALEMAN



Developing a talent for science



Business flirting

The day ended cheerfully with some drinks and snacks, giving us the opportunity to relax and have a discussion with the lecturers. We were very happy to hear that the PhD-students enjoyed the day. Someone even said that it was the most fun BCN day ever. We hope to keep up the good work and see all of you at next year's PhD-day!

■ NYNKE GROENEWOLD  
ON BEHALF OF THE BCN PHD-COUNCIL

# Opening of the new academic year 2010-2011



At the entrance of the opening of the new academic year, the union was protesting against budget cuts in job employment conditions of the university staff. Loafs of bread (without bread fillings) were handed out with the slogan: "because science deserves it". The head of the board of directives quickly and humorously replied and handed out slices of Swiss cheese (with holes) to symbolize that the university will make sure that everybody gets bread fillings, but we need to understand that it will become more difficult as the governmental budget for universities is declining.

Next, prof. Frans Zwarts, the rector magnificus, spoke about the influence of globalization of scientific research on the international scientific climate. Countries like India, China, Brazil, Turkey and Saudi Arabia are investigating enormous amounts of money to establish new universities and research centres. Scientific research no longer can be seen as an exclusively western occupation, and researchers and scientific funds are migrating around the globe in order to optimize scientific progression. In order to attract funds and talent, it is utmost importance to be seen and to have sufficient mass. Therefore, the University of Groningen is going to intensify its cooperation with several Dutch and German universities. These universities have collectively decided to formulate four scientific spearheads: green energy, technology and health, nutrition and health, and nanotechnology.

## Awarding the Guyot prize to Dr. James Hudspeth

After a musical intermezzo, Prof. P. van Dijk (specialist in audiology) introduced Dr. J. Hudspeth, from the Rockefeller University New York, and explained that he receives the Guyot prize for his groundbreaking work on the biophysics of the sensory hair cells in the ear. Dr. Hudspeth showed how acoustical excitation of the ear leads to electrical responses in auditory hair cells. In addition, he discovered a mechanism that could underlie the active amplification of sound in the inner ear. He disentangled several key steps in the detection and transduction of sound. Dr. Hudspeth combined challenging experiments with insightful theoretical models, combining biology, biomechanics and biophysics.

Then, Dr. Hudspeth was called to the stand and explained to the audience what inspired him in working on hair cells. There are two

main reasons. First, hearing impairment and deafness have a big impact in society. In industrialized countries approximately ten percent of the people have hearing difficulties. A reduced ability to communicate leads to social isolation, with far fetching consequences for the individuals that experience it. Second, Dr. Hudspeth was intrigued by the exquisite sensitivity of the inner ear. He mentioned the work of Wessel de Vries, a physics professor in Groningen, who estimated the amount of energy the ear needs for a sound to be detectable. The ear seems to have pushed its sensitivity limits to the edge of what is physically possible. Then, Rector Magnificus, F Zwarts, handed the Guyot medal to Dr. Hudspeth.

## History of the Guyot-prize

Dr. Hudspeth is the 19th recipient of the Guyot prize. This prize is named after Henri Daniel Guyot, who founded the School for the Deaf in Groningen in 1790. Guyot studied Theology at the University of Franeker, and became a professor at the University of Groningen. More than a century ago, his grandson H.D. Guyot donated his legacy to the University of Groningen to give a prize to the person that did the most important discovery in the field of otology. This prize is awarded approximately every five years. Since 1914, the prize has been awarded to outstanding scientists. Among them are two Nobel Prize winners.

Dr. Hudspeth will be in the list of outstanding scientists that you find on the university webpage: <http://www.rug.nl/corporate/universiteit/feitenencijfers/prijzenpenningen/guyotprijz>

- INGE HOLTMAN
- PROF. PIM VAN DIJK

# Interview with Dr. James Hudspeth, F.M. Kirby Professor

**Since the seventies your basic research theme evolves around the molecular underpinnings of signal transduction by hair cells. What initially caused you to enter this field?**

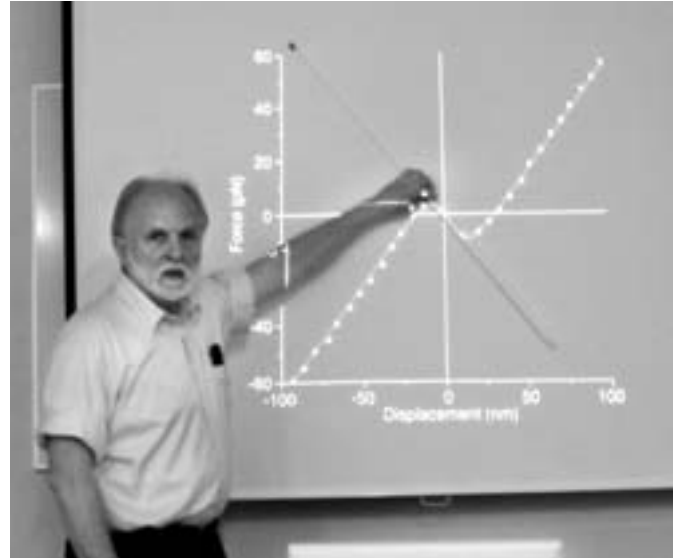
It's a funny story actually. As a graduate student, back in the late 60's, I was working with a professor about visual processing. He, like many other professors, was somewhat lazy about teaching. He decided to avoid some of the lectures on 'boring' subjects by assigning them to the three graduate students. Each student was to give a lecture about a subject to the medical students. One of these subjects was signal transduction in the ear. The three students discussed these and I was impressed about how little was known about hearing at the molecular and cellular level. In vision already a lot was known about photoreceptors and the retina and many people were working on it with rather sophisticated tools and analysis. In the auditory system this was not happening. When I went to Sweden to do my post-doc at the lab of Åke Flock about the auditory system, I decided signal transduction in hair cells was a good thing to work on. When I got my first job at California Institute of Technology (Caltech) as an assistant professor, I immediately started working on it.

**You have been in many different top facilities and research center. How did working in each of these facilities helped to shape your thoughts and contribute to your scientific progress?**

I started in Harvard as an undergrad and continued into graduate school. In that time, there weren't any neuroscience programs in most universities in the world yet. It was really a new field. There were only three in the US and Harvard had the strongest program at that time. Stephan Kuffler, the first editor of "From neuron to brain", which is still in print today, was the one who invented neuroscience as a new discipline. He worked at the department of pharmacology and attracted several good people and they splitted up and founded the department of neuroscience. I was one of the first students. Everything had to be invented, there was no curriculum or books, but it was very rich and stimulating.

My first job as an assistant professor was at Caltech, and this is the only real university I have worked. All the other facilities were medical centers and research institutes that did not have a lot of different disciplines. For me Caltech was a very important place, simply because I could interact with mathematicians and physicists who taught me new techniques and analysis, which I needed to describe the mathematical relation between the mechanical stimulation of the hair cell and the electrophysiological output.

The next two jobs I had were at University of California, San Francisco (UCSF) and the Texas Medical Center in Dallas and these were complete medical facilities. Somewhat like the UMCG over here. They don't have mathematics or physics, let alone humanities. So they were more restricted. The advantage of those, particularly UCSF, was that there was an excellent research community. It was one of the best medical research facilities in the world back in the 80's. Many premier people like Mike Bishop and Harold Warnus (Nobel



prize winners in Medical Physiology in 1989), Bruce Albert (Editor of Science magazine) were there. It was a really good place to do research with excellent students and post-docs. I went to Dallas for a different reason. They did not have a neuroscience program, but they wanted to develop a program and recruited me to come and set one up. This proved to be kind of frustrating because they did not give me the kind of support they promised. That's why I left after some time.

Finally, Rockefeller University in NY is really a premier research institute. It calls itself a university, but it's not so true. It's really focusing on biomedical research. Furthermore, New York has a very international community, a little bit similar to what you have over here and is very appealing for researchers from Europe. This is very different from the central part of the US, which is not so aware of the rest of the world. Moreover, suburban America is kind of boring for foreigners to live. New York, contrarily, is a nice place to live, which helps to attract highly motivated students from all over the world.

**Guyot prize is only one of the many prizes you have won, because your research is considered to be groundbreaking by many. What do you see as your most important contribution?**

I think that my work has evolved around two major points. First, in the beginning of my career, I was trying to find systematic ways to study the biophysics of individual hair cells. The field was dominated by people from communication studies, and they regarded the ear as sort of a black box. Sound goes in and electricity comes out. No one asked what an individual hair cell does. It was already discovered how sound waves travel and so on, but no one looked at the transduction process, which seemed to me as the crucial part of the system. Initially, I was interested in mechanical transduction in general. We still know very little about how touch, muscle spindles or Golgi tendons work. If you look at these sensors, most of them are difficult to work on, because they are buried in the skin, incorporated

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into connective tissue. The hair cell is unique, because it flows freely in fluid and you can work on it directly, and you know that's where the activity begins. My first contribution is, to develop the system and the tools to stimulate the hair bundles and to develop the microelectrodes necessary to measure activity and working out the mechanism by which the stimulus is transduced into an electrical response.

My second contribution is the involvement, for more than the last decade, in the active process, or the amplifier. Our ear is about 100 times more sensitive than would be if it would simply be a passive amplifier. It can also make spontaneous acoustic emissions and other phenomena of this sort. The question is: 'what is that?' In the animal models, with which we worked, mainly frogs and lizards, we understand the system quite well. Namely the hair bundle itself is not just a passive antenna, but is actively amplifying. The question remains whether this same process applies in mammals or if there are other processes contributing to it. However, this is still quite controversial.

***What, in your opinion, is the difference between a solid, good scientific career, and an excellent, groundbreaking career? In other words: what defines if something is groundbreaking?***

A groundbreaking career is defined partly by luck and timing. Science is funny that way, because there are times at which a problem is ripe to be solved. If one is too early, the experimental tools or the analytical tools are not there. So people can make important insightful experiments but have to stop because it no longer is possible to continue. If one is too late, a lot is already done, and you're just doing routine research. The good fortune comes when one is able to find a topic that can be solved, with the equipment and analytical tools, or one is close enough to be able to develop them themselves. In my case for example, nobody had developed tools to stimulate the hair bundle. We had to develop recording equipment and stimulators and so on, necessary to deal with very small forces and low voltages. But the technology was there, so we were able to succeed in doing that.

***Neuroscience is young and very fragmented discipline, due to many different themes and many different techniques. What do you think should be the characteristics of a neuroscience graduate program like the BCN-graduate school?***

I think your question somewhat defines the answer. Neuroscience is unusual in a way because it is not unified by a philosophical or technical approach like mathematics, ordinary biology or evolutionary biology. Each of those has a particular methodology that applies to the subject matter. Neuroscience is not like any of those, because it focuses on the brain and the rest of the nervous system. There is not something like that for other organs. Therefore, a good neuroscience program should have a lot of breadth. In other words, it needs to teach students the necessary biophysics, mathematics and chemistry, as well as the integrative approaches like artificial intelligence and computer science. A lot of breadth is necessary to become successful. The other point is that the new science will come not in the centre of the well established fields, but at the edges. The most exciting research will be at the boundary of things we understand well and things we don't understand at all. So I think it is necessary to have the breadth in order to be capable to see the holes, and what is missing in the existing fields.

Some of the people have an unduly narrow view, they come into the laboratory and they do the same things for four years. I think this can be very damaging, because they don't have the op-

portunity to look for holes where new work is to be done. The other thing that goes with that: it is very valuable to have good seminar series, so that people hear about different types of research. If somebody is interested in language processing, it is important that they go to lectures about biophysiology of the ear. Likewise, somebody who is working on cellular, molecular mechanisms should go to seminars about cognitive neuroscience, to see how their tools begin to apply to these types of research.

***Yesterday at the opening of the new academic year, Frans Zwarts, our rector magnificus spoke about globalization of scientific research. As he said new research facilities are rapidly established all over the world. How do you think this globalization changes the international scientific climate?***

I see it as an entirely positive thing. There is a lot of concern in the US, because we have been dominant in a lot of research since the Second World War. There is concern that the US is losing its edge. It is no longer as superior as it was. To me that seems like a narrow point of view. If the whole world is raising its level of scientific education, it has to be good for all of us. To look at the positive side for the US, a huge fraction of this research is done by people trained in the US. They are the core of the people who are founding the new universities. I have colleagues that went to Singapore to recruit good scientists. Saudi Arabia and the United Emirates are all trying to recruit people. The medical school next to our institution has opened a campus in Khatar and is actively training. I think the rector magnificus is entirely correct because there is enormous growth in all of these fields, which creates competitive pressure on everybody including the University of Groningen. But at the same time it is going to be a positive development worldwide. Many of these countries will begin to develop more independent scientific programs and will also develop their own technologies. In some of these countries it will also have a significant cultural impact. Most strikingly, in the United Emirates, women used to have low education and job opportunities, but now people are consciously changing that. When you enter these universities the same rules no longer apply. My suspicion is that this will be a constant change; these women will not go back, and stop driving an automobile once they return to other parts of the society. I think that sociological impact of a worldwide increase in scientific research and education will eventually benefit everybody.

***My last question: what are your scientific plans for the future?***

For the immediate future, we will continue with the problem of the active amplifier at the level of the cochlea and with single hair cells. We are almost done with research on lower animals like amphibians. Now, we are interested to see if the same thing applies in mammals as well or if there are any other processes contributing to the active amplification.

Another issue is the development of hair cells and their regeneration. Once a hair cell dies, it is not replaced. However, the long term hope is that we can restore hearing by stimulating stem cell differentiation in the ear. Many groups are currently working on this.

For our research, we use zebra fish as a model, because they have stem cells that are capable to differentiate into hair cells. We have literally thousands of these animals, spread over hundreds of small fish tanks. The advantage of this animal is that they reproduce relatively fast for a vertebrate and they are transparent in the first two weeks



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after gestation. You can see the lateral line and the cochlear development from precursor cells in real time. Right now, we are developing molecular labels for precursor cells and we are looking at the stem cells. The idea is that once we have proper ways to identify and separate them, we can look at the expression profile and determine the molecular pathways that regulate stimulation and inhibition of differ-

entiation. The ultimate question is: "do humans still have stem cells?". If we can identify these stem cells, maybe the day will come that we can activate them and let the degenerated hair cells be replaced by new.

■ INGE HOLTMAN

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## Alumnus

# Research Robin Hood style

**After spending the bigger part of my physics education on 'Zernike' I moved closer to the medical faculty to work on my Masters final project at the BCN Neuroimaging Center (NiC). I worked on blood flow measurements in the brain using MRI techniques (or arterial spin labeling for those who are interested). Shortly after, I joined the ENT department in the UMCG to start a PhD supervised by Pim van Dijk and Emile de Kleine and used neuroimaging techniques to find neural correlates of tinnitus – the perception of a sound when there is no sound source around. This is a short description about how Cris Lanting moved from a PhD in Groningen to a postdoc in the land of Robin Hood: Nottingham.**



In the last year of my PhD I more and more focused on a post-PhD-career. I thought of two rather different careers; one was trying to obtain a training position as a clinical physicist while the other was to find a suitable post-doc career, each with their own pro's and con's, with job security as a notorious difference between the two. After a job interview for the training position I got feedback that they did not select me for the job – not that they thought I was not well-suited for the job but because they thought I was a bit science-y for a clinical training position (or, this is at least what they told me...).

Time passed by as well as several deadlines and by mere chance two similar job opportunities arose in the field of hearing research, one a post-doc on translational research on tinnitus and the other about fundamental hearing research; mainly about the question how basic sound features, such as pitch, sound location or phonological identity, are mapped in the human auditory cortex. I consequently visited the MRC Institute of Hearing Research (IHR) in Nottingham where they have around 30 scientists devoted to research on the auditory system, ranging from neurophysiology in animals to non-invasive studies on signal processing in humans and (at least partly) aimed at improvement of hearing in noise for people with hearing aids and cochlear implants.

As you may have guessed by now, I got the job and have been working on the representation of sound frequency in the auditory cortex for exactly a year now. The position here is for three years,

allowing for the set-up, data acquisition and dissemination of more than one big project. In my case, I have been doing EEG and will start an fMRI study (again) shortly. Apart from being part of a big community of inspiring hearing scientists, I am also quite privileged to collaborate with the MR physicists at the 'Sir Peter Mansfield Magnetic Resonance Center' - hosting a Nobel Prize laureate for the work in magnetic resonance imaging (i.e., Echo Planar Imaging and slice selection). Key factor is that they have extensive experience with ultra-high-field MRI and we will be their expertise at 7T MR to study the representation of sound in the auditory cortex.

So, is the UK really about pubs? As part of the British culture they inevitably introduced me to the Friday-after-work-pub-events, basically the same as with the people from the NiC but on a regular basis. Don't look surprised if you head to the pub on a –let's say– Tuesday to find several colleagues enjoying their ale's (or lager if they don't trust the dark side of the ales). Going to the pub straight from work can be hazardous from a health and safety's perspective (personal experience, just don't ask) but thankfully the pub food is quite enjoyable. Don't expect a Michelin star meal but there is more to the menu than just fish and chips. That said, it is rather impossible to find a place where they don't serve a full English breakfast (bacon, eggs, fried or grilled tomato, fried mushrooms, toast, a sausage and beans in tomato sauce). Yet, there are few colleagues that actually enjoy a daily, full English breakfast. The Dutch similarly don't always start the

day with 'pap'. Additionally, you have to be rather specific when you order your tea to prevent it being a dairy product as they like it best that way...

As mentioned before, people tend to go to the pub after work regularly. Night-life in general tends to start early, at least by Dutch standards. At seven pm on a typical Friday or Saturday you'll be able to find scarcely dressed, slightly boozed-up people on the street either on their way home or on their way into town from a binge-drinking-party to save some money in the pub. And the Brits love dressing up; give them a theme and they will use it to the full extent to show-off their dress (or the lack thereof).

Did the UK live up to its expectation? Some of the British stereotypes are actually true; I'm still baffled by the British etiquette and politeness. Just observe a random bus stop and you'll probably find a nice queue. Growing up in the Netherlands ('is this the same as Holland?') is a popular question) I'm constantly expecting the crowd to go berserk and try to squeeze in as many and as fast as possible. Not in this country. People wait for their turn and equivalently, the bus

driver will wait until the cue dissolved nicely into his double-decker bus before departing on the left lane.

Last but not least I have some advice for those intending to go abroad: Join a club! Get a small social circle that involves more than just colleagues. Inevitably, your colleagues will have a similar level of education and likely to come from different countries as well. To get to know more about the city or country, get in touch with locals. In my case, this boiled down to joining a korfbal club and meeting interesting (and native) people on a regular basis while keeping fit at the same time!

So, concluding an impression of Cris in the UK, I think I haven't had a hard time to blend in. The culture shock is limited, as well as the time difference compared to the Netherlands.

■ CRIS LANTING  
CAREER DEVELOPMENT FELLOW  
MRC INSTITUTE OF HEARING RESEARCH

## BCN Research Master page

# Expansion of the BCN community

**Introduction.** Recent development in the BCN community has once again led to a number of graduations of Master students. Their graduation resulted in the formation of a new cohort that started the BCN research master program in September. We are two of these new students and will join the BCN newsletter team in order to study and document the development of the BCN research community and the master students in particular. This is a unique possibility to set up a quasi-experiment that we hope will shed more light on (a) the development of these students during the course of the BCN master program and (b) their interaction with the rest of the BCN research community.

**Methods.** Seventeen students (9 males, 7 females, average age = 21.3, SD = 1.9) agreed to participate in this two-year experiment. They have previously studied in seven countries on four continents and chose to join one of the three tracks of the BCN research master program (random assignment to tracks has not been approved by the ethics committee). To ensure sustained motivation during the longitudinal experiment, the University of Groningen offers a Master degree to those completing the entire experiment.

**Results.** Since the experiment is not completed, yet, we can only report preliminary results. All students reported that lectures and lab classes are quite different from those they attended during their Bachelor's degree because they are in much closer contact with the lecturers and there are not that many students. During the course Models of Cognition, for example, C-track students often had presentations and discussions with two or three professors and seven students. This is completely different from lectures during the Bachelor's in which one would hardly get in touch with a professor personally

or engage in a discussion with one of the other 500 people in the room. While students prefer the personal setting, they also report that the pressure is a lot higher because they are constantly observed and scrutinized.

Another aspect of interest is social interaction among group members. As noted above, students have previously studied in different places and the socio-cultural background is quite diverse. Social interaction developed spontaneously and without any problems, though. Due to extensive prior training a language barrier is virtually non-existent. We witnessed several instances of intra- as well as intergroup interactions that were organized on short notice and have increased group coherence significantly. We hypothesize that many such encounters will follow during the course of the experiment and look forward to documenting them.

**Discussion.** Through the BCN research master program, 16 students with different backgrounds have been brought together and a new group emerged. The first exams have been written and the first courses completed already and those that have not previously lived in Groningen settled here. Introduction to BCN lectures as well as track-specific classes continue and while some students already chose a topic for the upcoming minor thesis, others are still hunting for a suitable research question.

Even though there is not that much to talk about yet, the previous discussion has made clear that the program took off as planned and that the new cohort provides unique characteristics that we hope to study in more detail in the next months and years.

■ DAFNE PIERSMA  
■ FLORIAN SENSE

## Beauty in mathematics

PROMOVENDUS

U. Montaña Juárez

PROEFSCHRIFT

Beauty in mathematics

PROMOTORES

Prof. dr. T.A.F. Kuipers

Prof. dr. I. Douven

### De schoonheid in wiskunde

Uliánov Montano's promotieonderzoek gaat over esthetische oordelen in de wiskunde. Het gebruik van uitdrukkingen als 'Cantors diagonaalbewijs is elegant' of 'Eulers identiteit is de mooiste formule van de wiskunde' is heel gebruikelijk onder wiskundigen. Nu zijn 'mooi' en 'elegant' termen die geregeld door iedereen gebruikt worden, terwijl de toepassing ervan in de wiskunde resulteert in twee soorten vertwijfelde reacties: ten eerste kan een niet-wiskundige het gebruik van het woord 'mooi' in deze context vreemd vinden. Ten tweede blijken wiskundigen te proberen wiskundige schoonheid te herinterpreteren in termen van de beginselen en voorschriften van de wiskunde zelf. Montano's theorie over wiskundige schoonheid biedt een manier om deze vertwijfelde reacties te voorkomen.

Montaña beweert dat mathematische schoonheid een vorm van 'normale' schoonheid is en dat er geen herinterpretatie noodzakelijk is. Ter ondersteuning van deze bewering, ontwerpt hij een esthetische theorie die laat zien dat esthetische oordelen in de wiskunde (en misschien ook in andere soorten intellectuele activiteiten) echte esthetische oordelen zijn. Daarbij baseert hij zich op inzichten in en resultaten uit de experimentele psychologie en de neurowetenschappen, op filosofische en psychologische theorieën over emoties in de kunst, op muziekfilosofie en op wetenschapsfilosofie.

**Uliánov Montaña Juárez** (Mexico, 1973) studeerde wetenschapsfilosofie in Mexico. Hij deed zijn onderzoek als Ubbo Emmius Bursaal bij de faculteit Wijsbegeerte van de RUG. Hij promoveerde op 22 april 2010.

## Role of genetic and environmental factors in tic disorders

PROMOVENDUS

N.G.P. Bos-Veneman

PROEFSCHRIFT

Role of genetic and environmental factors in tic disorders

PROMOTORES

Prof. dr. R.B. Minderaa

Prof. dr. C.G.M. Kallenberg

### Tics niet alleen genetisch bepaald

De ernst van tics en tegelijk optredende symptomen ('comorbide symptomen') bij kinderen met een tic-stoornis wordt waarschijnlijk bepaald door een samenspel van genetische en omgevingsfactoren, zoals zwangerschaps- en bevallingsomstandigheden en infecties. Dat ontdekte onderzoekster Netty Bos-Veneman, die naging of er relaties bestaan tussen zulke genetische en omgevingsfactoren.

Bos-Veneman ging eerst na welke rol de zwangerschap speelt in het ontwikkelen van een tic-stoornis. Ze ontdekte dat het in de baarmoeder blootgesteld worden aan roken en het geboren zijn na een gecompliceerde zwangerschap of bevalling mogelijk invloed heeft op de ernst van tics en comorbide symptomen. Niet alleen de zwangerschap, maar ook het samenspel tussen verschillende soorten genen ('serotonerge' en 'dopaminerge' genen) en perinatale factoren hebben



volgens de promovenda een belangrijk aandeel in de ernst van tics. De onderliggende mechanismen moeten volgens haar echter nog verder onderzocht worden.

**Netty Bos-Veneman** (Zutphen, 1975) studeerde geneeskunde aan de Rijksuniversiteit Groningen. Ze verrichtte haar onderzoek bij Accare, universitair centrum voor kinder- en jeugdpsychiatrie, in Groningen, en maakte daarnaast deel uit van onderzoeksschool BCN. Het onderzoek werd bekostigd door Accare. Bos-Veneman was van juni tot september onderzoeker aan de afdeling Huisartsgeneeskunde van het Universitair Medisch Centrum en begint na haar promotie aan een opleiding tot huisarts. Zij promoveerde op 1 september 2010.

## The infant motor profile. A standardized and qualitative assessment of motor behaviour in infancy

PROMOVENDUS

K.R. Heineman

PROEFSCHRIFT

The infant motor profile. A standardized and qualitative assessment of motor behaviour in infancy

PROMOTORES

Prof. dr. M. Hadders-Algra

Prof. dr. A.F. Bos

### Beweeglijkheid baby's betrouwbaar in kaart te brengen

De Infant Motor Profile (IMP) is een betrouwbaar meetinstrument om de motoriek van zuigelingen kwalitatief te beoordelen. Het instrument is geschikt om motorische problemen in een vroeg stadium op te sporen, waardoor ontwikkelingsproblemen snel met fysiotherapie bijgestuurd kunnen worden. Dat blijkt uit onderzoek van promovenda Kirsten Heineman.

Op consultatiebureaus wordt de motoriek van zuigelingen op een kwantitatieve manier bestudeerd: er wordt gekeken naar de motorische prestaties, de mijlpalen. Maar het is ook nuttig om te kijken hoe mooi en gevarieerd een baby zich beweegt. Om dat te beoordelen is een meetinstrument nodig dat eventuele problemen goed in kaart brengt. De IMP is hiertoe zeer bruikbaar, zo

laat dit promotieonderzoek zien. Het instrument beschrijft de motoriek van zuigelingen aan de hand van tachtig items, verdeeld over categorieën als variatie, vloeïendheid en symmetrie.

Heineman analyseerde videobeelden van zo'n 200 op tijd en te vroeg geboren baby's van 3 tot 18 maanden. De betrouwbaarheid en de validiteit van het instrument zijn goed, concludeert de onderzoeker. Ze vond duidelijke verschillen tussen op tijd en te vroeg geboren kinderen. Bovendien was er een duidelijke relatie tussen IMP-scores en risicofactoren voor het ontwikkelen van motorische problemen, zoals afwijkingen op schedelecho's van baby's. Voordat het meetinstrument op consultatiebureaus en in ziekenhuizen kan worden toegepast, is nog nader onderzoek nodig.

**Kirsten Heineman** (Nijmegen, 1978) studeerde geneeskunde en bewegingswetenschappen in Groningen. Ze verrichtte haar onderzoek op de afdeling Ontwikkelingsneurologie van het Beatrix Kinderziekenhuis van het UMCG. Heineman is thans in opleiding tot neuroloog in het UMCG. Zij promoveerde op 8 september 2010.

## **Generative AI: a neo-cybernetic analysis**

PROMOVENDUS

C.M. van der Zant

PROEFSCHRIFT

Generative AI: a neo-cybernetic analysis

PROMOTOR

Prof. dr. L.R.B. Schomaker

### **Hoe construeert de geest zichzelf?**

#### **En kan een machine dat ook?**

De intelligentie van machines wordt nog steeds gebouwd door mensen. Zolang machines niet in staat zijn om zelf intelligentie te ontwikkelen zullen ze alleen maar de slimheid van de ontwerpers tentoonspreiden.

De betrokkenheid van mensen voor de automatische constructie van mentale structuren en subjectiviteit in machines, hindert de ontwikkeling en de autonomie van intelligente machines op een zeer diepgaand niveau. Het lichaam-geestprobleem dat velen in de robotica aanpakken zou volgens promovendus Tijn van der Zant eigenlijk het lichaam-geest-constructieprobleem genoemd moeten worden. Er bestaat echter geen algemene theorie over hoe de geest zichzelf construeert. Machines die de eigen geest opbouwen hebben generatieve mechanismen nodig voor de constructie van en het testen van hun mentale machinerie, net zoals dieren en mensen ook generatieve mechanismen bezitten om hun geest te vormen.

Van der Zant ging op zoek naar de generieke mechanismen achter de autonome constructie van de geest. Hij onderzocht wat er op het moment nog mist in de Kunstmatige Intelligentie om dit te bereiken. De theorie die hij ontwikkelde, genaamd Generative Kunstmatige Intelligentie, is gebaseerd op de moderne natuurkunde, biologie, sociologie, robotica, kunstmatige intelligentie en neuropsychologie. Vanuit dit nieuwe theoretische perspectief wordt vervolgens gekeken in hoeverre de huidige wetenschappelijke technieken in staat zouden moeten zijn om machine intelligentie te verwezenlijken. Dit gebeurt onder andere door nieuwe interpretaties te geven van bestaand onderzoek van het automatisch herkennen van handschrift en het ontwikkelen van robots voor huishoudelijke taken.

**Tijn van der Zant** studeerde aan de Universiteit Utrecht. Het onderzoek is uitgevoerd bij de afdeling AI van de RUG in samenwerking met het Nationaal Archief in Den Haag en het Kapteyn Instituut en het expertise centrum Target van de RUG. Het onderzoek werd gefinancierd door NWO. Hij promoveerde op 24 september 2010.

## **A dynamic perspective on second language acquisition**

PROMOVENDUS

T. Caspi

PROEFSCHRIFT

A dynamic perspective on second language acquisition

PROMOTOR

Prof. dr. C.L.J. de Bot

### **Een dynamisch perspectief op tweede-taalontwikkeling**

Tal Caspi past in haar proefschrift de Dynamische Systeem Theorie (DST), een breed geaccepteerde benadering van complexe natuurlijke systemen, toe op de ontwikkeling van een tweede taal. Caspi deed twee casestudies naar de ontwikkeling van het Engels als tweede taal bij vier gevorderde leerders met verschillende moedertalen. De eerste studie richt zich op woordenschatverwerving, gedefinieerd als een continuüm van receptieve en productieve woordkennismiveaus. De tweede studie richt zich op de ontwikkeling van schrijfvaardigheid in vier categorieën: lexicale complexiteit, lexicale correctheid, syntactische complexiteit en syntactische correctheid. Beide studies onderzoeken de toepasbaarheid van DST binnen deze deelgebieden.

Het belangrijkste uitgangspunt van DST is dat ontwikkeling non-lineair verloopt, omdat dit het resultaat is van de steeds veranderende interacties tussen de zich ontwikkelende componenten van het taalsysteem. Deze interacties komen voort uit twee factoren die zich in vrijwel alle domeinen voordoen: een hiërarchie in de ontstaansvolgorde en de beperkte beschikbaarheid van voor de groei noodzakelijke bronnen. Door deze factoren zijn de interacties tussen de zich ontwikkelende taalsystemen conditioneel, en gelijktijdig ondersteunend en met elkaar in competitie. In de context van het voorliggende onderzoek impliceren deze DST principes dat receptieve woordenschatkennis voorafgaat aan productieve kennis, dat lexicale kennis voorafgaat aan syntactische kennis, en dat complexiteit voorafgaat aan correctheid. Binnen deze ontwikkelingsvolgordes is receptieve woordenschatkennis een noodzakelijke voorwaarde voor de ontwikkeling van productieve kennis, maar is tegelijkertijd ook hiermee in competitie. Hetzelfde geldt voor de relatie tussen lexicale



en syntactische kennis. Lexicale kennis is een noodzakelijke voorwaarde voor de ontwikkeling van syntactische structuur, maar ook deze ontwikkelingsprocessen zijn met elkaar in competitie, doordat zij gebruik maken van dezelfde beperkte bronnen. Door middel van een dynamisch mathematisch model waarin de van de data afgeleide interacties werden gemodelleerd, konden deze hypothesen empirisch worden bevestigd.

**Tal Caspi** (Israël, 1973) studeerde Applied Linguistics aan de Rijksuniversiteit Groningen. Ze verrichtte haar onderzoek bij het Center for Language and Cognition Groningen aan de Faculteit der Letteren van de RUG. Zij promoveerde op 7 oktober 2010.

### **English language attrition and retention in Chinese and Dutch university students**

PROMOVENDUS

Xiaoyan Xu

PROEFSCHRIFT

English language attrition and retention in Chinese and Dutch university students

PROMOTORES

Prof. dr. K. de Glopper

Prof. dr. C.L.J. de Bot

### **Verlies Engels als vreemde taal bij Chinese studenten groter dan bij Nederlandse**

Promovenda Xiaoyan Xu onderzocht verlies en behoud van het Engels als vreemde taal bij Chinese en Nederlandse universitaire studenten. De studenten zijn twee jaar na het beëindigen van hun onderwijs Engels getest op hun taalvaardigheid. Beide groepen hebben gedurende een qua lengte vergelijkbare periode onderwijs Engels gehad, maar wel in sterk verschillende taalomgevingen. De Chinese studenten bleken twee jaar na het einde van hun onderwijs Engels op alle geteste vaardigheden achteruitgang te vertonen, terwijl de Nederlandse studenten geen verlies lieten zien, afgezien van hun schrijfvaardigheid.

Het doel van Xu's onderzoek was vast te stellen of er verschillen in verlies en behoud waren tussen de twee groepen en in hoeverre factoren als mate van contact, attitudes en onderwijskenmerken eventuele verschillen zouden kunnen verklaren. De

Chinese studenten werden drie maal getest met een jaar interval, de Nederlandse studenten twee maal met een interval van anderhalf jaar. De belangrijkste bevindingen waren dat de Chinese studenten twee jaar na het einde van hun onderwijs Engels op alle geteste vaardigheden achteruitgang vertoonden, terwijl de Nederlandse studenten geen verlies lieten zien, afgezien van hun schrijfvaardigheid. Bereikt niveau van taalvaardigheid aan het begin van de 'incubatieperiode', de periode na het onderwijs Engels, bleek een groot deel van de variatie tussen de studenten te verklaren. Een hoge aanvangstaalvaardigheid ging samen met meer behoud van het Engels. De data laten zien dat attitudes t.a.v. het Engels ook een rol speelden: positievere attitudes gaan samen met minder verlies. Een van de belangrijkste verschillen in de taalomgeving van de twee groepen studenten is dat het Engels veel meer aanwezig is in de Nederlandse setting dan in de Chinese. Toch bleek mate van contact met het Engels de verschillen in verlies niet te verklaren. Mogelijk is met de gebruikte wijze van meten van taalcontact de meest relevante informatie niet gevonden.



**Xiaoyan Xu** (China, 1973) studeerde Applied Linguistics aan de Rijksuniversiteit Groningen. Ze verrichtte haar onderzoek bij het Center Language and Cognition Groningen van de Faculteit der Letteren en bij onder-

zoeksschool BCN (Behavioral and Cognitive Neurosciences) van de RUG. Zij promoveerde op 21 oktober 2010.

### **Context-based sound event recognition**

PROMOVENDUS

M.E. Niessen

PROEFSCHRIFT

Context-based sound event recognition

PROMOTOR

Prof. dr. L.R.B. Schomaker

### **Borende buurman irriteranter dan verkeerslawaaai**

Bij het herkennen van geluid, maar ook bij het beleven ervan, speelt de context een belangrijke rol. Informatie over de omgeving kan de kwaliteit van computerprogramma's voor geluidsherkenning daarom flink verbeteren, concludeert cognitief wetenschapster Maria Niessen.

Niessen ontwikkelde een computermodel voor geluidsherkenning dat akoestische informatie combineert met contextinformatie. Zonder informatie over de omgeving lijken geluiden sterk op elkaar. Daardoor zijn ze soms moeilijk te herkennen. Het spinnen van een kat is zonder context bijvoorbeeld nauwelijks te onderscheiden van motorgeluid.

Niessen voegde informatie over de context toe aan haar model door de computer te trainen aan de hand van geluidsopnamen. Daarbij maakte ze gebruik van de manier waarop mensen hun geheugen aanspreken om geluiden verwerken. Eerdere ervaringen en herinneringen spelen bij de mens een essentiële rol bij het interpreteren van geluiden in nieuwe situaties. Door te berekenen hoe waarschijnlijk het is dat een geluid in een bepaalde situatie voorkomt, kan het model van Niessen bepalen of een geluid tot de bron behoort of achtergrondgeluid is.

Ook de perceptie van geluidsoverlast wordt bepaald door de context van het geluid. Afhankelijk van de situatie kan eenzelfde geluid als overlast worden ervaren of juist niet. Zo kunnen mensen het geluid van een scooter in een park heel verschillend interpreteren. De bestuurder van de scooter heeft nauwelijks last van het motorgeluid, misschien geniet hij er zelfs van. Iemand die rustig op een bankje zit te lezen zal de voorbijrazende

scooter echter als storend ervaren. Hetzelfde principe gaat op voor de burens: wanneer de buurman met de boormachine aan de slag gaat, veroorzaakt dat veel eerder geluidsoverlast dan langrijdende auto's die net zo veel geluid produceren.

Het model van Niessen kan de bepaling van geluidsoverlast sterk verbeteren. In de huidige methoden om geluidsoverlast te bepalen spelen alleen luidheidmaten, decibellen, een rol. Een ontoereikende methode om geluidsoverlast te bepalen, stelt Niessen: 'Alleen bij extreem hard geluid, zoals dat van een laag overvliegende straaljager, ervaart vrijwel iedereen het geluid als geluidsoverlast. Maar tot ongeveer 70 dB is de geluidcontext bepalend. Met een model dat context meeweegt, is veel beter inzicht te verkrijgen in de vraag of mensen een geluid daadwerkelijk als overlast ervaren.'

Daarnaast is het model toepasbaar in robots die zelfstandig door een onbekende omgeving bewegen. Zoals robots die bewoners van een verzorgingstehuis helpen met huishoudelijke taken. Niessen: 'In het onderzoek naar dergelijke robots gaat veel aandacht uit naar zicht, niet naar geluid. Terwijl geluid juist heel belangrijk is om de omgeving waar te nemen en daarop te reageren.'



**Maria Niessen** (Apeldoorn, 1980) studeerde Kunstmatige Intelligentie aan de Rijksuniversiteit Groningen. Haar onderzoek werd medegefinancierd door SenterNovem. Sinds februari is Niessen verbonden als postdocoraal onderzoeker bij INCAS3, waar ze haar onderzoek naar geluidsoverlast voortzet,

in samenwerking met L'équipe "Lutheries - Acoustique - Musique" in Parijs. Maria Niessen promoveerde op 22 oktober 2010.

## **Signal-driven sound processing for uncontrolled environments**

PROMOVENDUS

J.D. Krijnders

PROEFSCHRIFT

Signal-driven sound processing for uncontrolled environments

PROMOTOR

Prof. dr. L.R.B. Schomaker

### **Geluidsherkenning beter afgestemd op de praktijk**

Apparatuur voor het automatisch herkennen van geluid wordt steeds vaker in de praktijk toegepast in plaats van in het laboratorium, en dat betekent dat er meer dan één bron aanwezig kan zijn. Dirk-Jan Krijnders ontwikkelde een methode voor automatische geluidsherkenning die daar rekening mee houdt. Hij neemt daarbij overigens aan dat het onwaarschijnlijk is dat meerdere bronnen op hetzelfde moment dezelfde frequentie produceren met vergelijkbare energie.

Krijnders testte de methode op een aantal nieuwe datasets, die zijn opgenomen zonder de omgeving te controleren. Een probleem bij dit soort datasets is om precies te weten welke geluiden er in voorkomen. Daarom liet hij ze eerst door mensen beluisteren, maar die bleken het niet altijd eens te zijn over wat ze hoorden. De kwaliteit van de voorgestelde methode voor automatische herkenning ligt in de buurt van de menselijke luisteraars.

**Dirk-Jan Krijnders** (1978) studeerde technische natuurkunde aan de Universiteit Twente. Het onderzoek werd uitgevoerd bij de afdeling Kunstmatige Intelligentie van de RUG. Krijnders werkt inmiddels bij het onderzoeksinstituut INCAS3 als postdoc. Hij promoveerde op 29 oktober 2010.

■ EVELYN KUIPER-DRENTH, OP BASIS VAN PERSBERICHTEN VAN DE RIJKSUNIVERSITEIT GRONINGEN

This newsletter is published by the School for Behavioural and Cognitive Neurosciences

Frequency: 4x a year  
Circulation: 650 copies

Publishing Office  
BCN Office (FA30)  
A. Deusinglaan 2  
9713 AV Groningen  
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Deadline for the next edition:  
1 February 2011

### **Training-program-registration-form**

Almost 60% of the BCN PhD students sent in the BCN training-program-registration-form. We are still busy with getting through all the forms, so if you didn't receive an update of the new amount of credits, please take in account that we received over 100 forms. If you forgot to send it, it is still possible: janine.wieringa@med.umcg.nl

### **BCN Training Programme 2011**

The new edition of the BCN Training Programme will be ready in January. I promised you a new edition in September but the rules and regulations concerning finance and training activities are still under debate. We will invite you by email for the BCN courses.

### **BCN Finance**

BCN PhD students, except for those who have an appointment within the FWN, still can apply for funding of attendance of courses and conferences. FWN PhD students should contact GSS for funding.

### **Requests for conference/course costs**

BCN only refunds costs of conferences and courses, if I receive the requests in advance. Please send, before the event starts, an email to me (d.h.koopmans@med.umcg.nl) with the following information:

- conference or course you would like to apply for;
- the location and date of the conference or course;
- if it concerns a conference: if you are going to give a presentation or present a poster;
- an overview of the expected costs.

The University would like you to fill in a so-called R-form, ask for such a form if the secretary of your group doesn't have it.

### **Refunding of conference costs**

I still received quite incomplete requests for refunding of conferences. If you would like BCN to pay for the costs of conferences, please be sure that your request includes the following:

- the original receipts of the payments (we don't refund costs of meals etc (only a conference diner));
- a review of your conference visit;
- your bank account number.

■ DIANA KOOPMANS  
BCN OFFICE



# Recipe of a good PhD-project

Hi, my name is Hanneke Bouwsema, and I am a PhD-student in Human Movement Sciences. In Human Movement Sciences a wide variety of fundamental and applied topics are studied, in fields of rehabilitation, sport, ageing, or work-related. My research project includes both the fundamental and the applied sciences. On the practical side I study movements of persons who wear arm prostheses, while on the fundamental side I develop a training program for these persons to increase the use and the functionality of their prostheses in daily life. This project started in November 2008, so I am halfway now, and so far, I am very content with the trajectory. There are a few things that contribute to this, and I would like to share them with you. So, here is my recipe of a good PhD-project:

› **Ingredient 1: start with a well-defined plan.** My project started with a well-defined plan, and so far this has worked out very well. I have talked to other PhD-students, who started their project with having only a vague idea of what the project was about. On the one hand this seems very interesting and challenging, because you can define your own plan. The drawback is that it can take a lot of your precious time, before you have figured out what to do and how to do it in the right way. Therefore, when you start with a well-defined plan, like in my project, this will give you a quick start, and no (or maybe only a few) frustrations.

› **Ingredient 2: have (a) good supervisor(s).** I have two great supervisors (Corry van der Sluis, rehabilitation physician, UMCG, and Raoul Bongers, assistant professor, Human Movement Sciences), who try to help me as much as they can to guide me through the project. And on top of that, they already think ahead with me to create opportunities to arrange a good position for me after this project. When you get along with your supervisors you can make things work! It is a pleasure to work in a good environment, and is already paying out: we have already 3 publications, and there are still a lot of data to process.

› **Ingredient 3: take your breaks.** Being a PhD-student means that you have to work, and work, and work... not only during working hours but, if necessary, also in the evenings or during the weekends. But you can also look at it from a different perspective: being a PhD-student also means that you can decide by yourself how and when you want to work! You can start as early or as late as you want (which comes in very handy if you have spent too many hours in a pub last night), or just work

from home. Chatting with other students or colleagues during coffee breaks is nice when you are stuck in whatever you are doing at that moment, or when you just do not want to do anything, there is always someone around to chat with (which sometimes results in days with almost 10 coffee breaks...). But this is no problem as long as you perform well.

› **Ingredient 4: Try to visit other places and meet other people.** Another nice aspect of being a PhD-student is the fact that you can present your work at symposia and conferences, in the Netherlands as well as in foreign countries. This way you can show your work to others and you learn from them, which contributes a lot to your knowledge and to your personal development. On top of this, you can visit places and meet people for free. You can see different places in the world while you do not have to pay for it yourself. So far, I have visited 3 conferences in the Netherlands, one in England, and one in Germany. Not that far away, but next year, in August, I plan to join a conference in Canada (and since I will be there during the summer, I'm thinking of spending my summer holiday there as well of course 😊) and in two years I will get the opportunity of visiting India for a conference!

And actually, at this moment, I'm writing this piece in a dorm room on the campus of the University of New Brunswick in Canada. I am here for two months to do an experiment and to learn about the life and the work here. This visit is the result of meeting people at conferences who are performing similar studies to what we are doing. My supervisors have arranged this visit, and although two months seems like a long period right now, (I've just arrived a couple of days ago) I think that this will be a once-in-a-lifetime experience for me. So, if you have the opportunity to go somewhere for a certain amount of time, I would say: go for it! Apply for money and get the chance to go to a completely different environment, to learn a lot, and to meet other (very nice) people!

These are a few things that contribute to my feeling lucky to be a PhD-student. Of course I do not always feel like this, there are times that I think: what am I doing?? But most times it feels good to perform research and hopefully, at the end, it means something for the society.

■ HANNEKE BOUWSEMA, AIO  
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