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# Cursor

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## i Colophon

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### Let grisly dogs lie

I hope the members of Zijlstra's review committee are prepared. In the days to come they'll be receiving packages from every corner of the Dutch academic world containing wordy proposals for performance agreements. Our package is definitely up to par with the others in that respect. In captivating prose, we paint the most wonderful panoramas

of our ambitions in education, research and knowledge valorization. The message could not be clearer: We're working our butts off here in Eindhoven, but it wouldn't hurt for the government to be a bit more lenient and financially accommodating. We understand the trees don't extend to the skies financially (sic), yet the government should take a look in the mirror and be more critical of the things that are currently either frustrating our ambitions or nipping them in the bud. And rightly so, if you ask me. We don't have to accept everything the chaos that is Den Haag present us with.

The critical approach of the article must please our University Council, or so I assumed. Wrong. They had a quite remarkable response: "TU/e expresses their criticism on government policy more than once. Caution is advised." To me, the world has gone topsy-turvy when a critical representative council argues it's best to let grisly dogs lie.

### The man of mystery

It wasn't easy finding sufficient information for a portrait of Arno Peels, the man who's been our Executive Board chairman for two years now. People I was hoping to have a chat with turned out to be in China, Brazil, and Venlo, or were on their way to Paris or Cambridge. Others weren't all too willing to cooperate: "I don't want to kick him while he's down" and "I consider it inappropriate to answer your questions in light of my connection to the Executive Board". In the end, however, I managed to paint a picture after all. To most people, Peels is



a warm, open man, although he is a bit of a mystery.

**More on page 4.**

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## ◀ Rewwwind www.tue.nl/cursor

Our Rewwwind feature provides you with snippets of last week's news. What happened online after the previous Cursor magazine was published?

### TU/e robot team wins European prizes

1 May 2012 - On Sunday, April 29, some two thousand people saw how the TURTLES, TU/e's Tech United robot team, won the Middle Size League soccer competition from Iranian team MRL at the RoboCup Dutch Open.

The thrilling final ended in 3-2. The @Home League, a competition in which four teams displayed the progress that's been made with care robots carrying out housework, also proved fruitful for Tech United and their robot AMIGO.

### Batavieren team TU/e-Fontys misses out

29 April 2012 - On Saturday, April 27, the TU/e-Fontys team was a mere eight minutes short of winning the fortieth Batavierenrace. The Wageningen University Team took the lead halfway through the

run and held on to it for the remainder of the neck-and-neck. The Wageningen runners finished the 172-kilometer course in 10 hours and 29 minutes, Eindhoven came in eight minutes after that.

### Dies 2012: How to make buildings more sustainable?

27 April 2012 - Thanks to a spirited contribution from Anne-Marie Rakhorst, the 56th Dies Natalis celebration turned into a fun party. With all the traditional items such as the opening lecture and the awarding

of the honorary doctorate - to David Harel - her pep talk about sustainability shook things up a bit. "Successes in sustainable business should be celebrated more often."

### Definitive construction plan Project 2

26 April 2012 - With the presentation of a model in Gemini's lecture hall last Thursday afternoon, the definitive construction plan of Project 2 was a fact. As from the fall of 2014, the new building will be home to the Departments of Electrical Engineering (EE) and Applied Physics (TN). According to

DH, the design is both sustainable and compact, and will allow for a great deal of interaction between students and staff.



Photo | Archive IEC



Photo | Michelle Breemans (CEC)

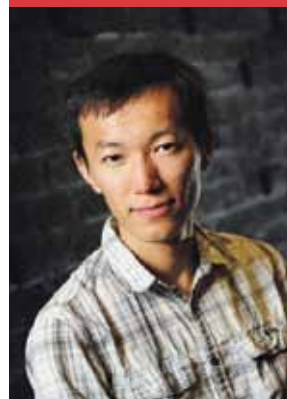
## ◀ Flashback

### Information for girls 1970 versus 2012

In Flashback, we link today's events with pictures of yore. We find out what they portray and describe what has changed since then. The caption of this edition's archive picture reads: 'Cabaret performance information days for girls 1970'. And that's all we know. The people involved have long since left TU/e. Even Harry Roumen is unable to be of assistance this time. "I haven't got the faintest idea what kind of night this was. A bottle of wine for the person who can shed light on the matter."

On to our recent photo: 'Girls' night out 2012'. It's an information night for girls who are considering a career at TU/e. It's now an evening activity, so parents can come along, and during the night there's information on research as well, so it's more than just fun and games. But who knows: maybe it was exactly the same back in 1970. Whoever has the answer can cash it for a bottle of wine. (NS)

## ≡ Clmn Brain-drain or brain-rent?



Recently I had a very disappointing skype-conversation with my former college roommate. I mentioned that I plan to stay and apply for a permanent job here. Surprisingly, instead of receiving words of support I was blamed for contributing to my country's brain-drain and was called ugly names like "betrayer" and "traitor". I started thinking about the moral aspects of my decision. First of all, I signed a contract with my scholarship sponsor. According to the contract, as a recipient of a TSP scholarship, I am obliged to work in a Dutch company for at least three years after my graduation. It's economically fair because my sponsors invested in my education and they expect to receive implicit dividends. I have a responsibility to carry out my contractual duties, and so my decision doesn't violate my internal moral rules.

Furthermore, I am not naive - I realize I am an alien here. Although I have better career opportunities and am surrounded by polite people whilst living in a more sustainable economic country, I still feel as a guest in the Netherlands. Sooner or later I will get tired of living outside my native culture. Then, save any act of God, I will decide to return home. However, I will return as a more experienced, educated and mature citizen who's able to contribute to my native country. It's more of a brain-rent, and it's useful for me, the Netherlands, and my motherland, and I see no rational reasons to feel guilty about it. After this self-analysis I started thinking about my accuser's motivation. I concluded that he envies me because I have access to opportunities he doesn't have access to. It's as simple as that, and there is no place for pseudo-patriotism.

Sultan Imangaliyev, from Kazakhstan, is a student of Systems & Control, Department of Mechanical Engineering



Dr.ir. Tom de Greef, assistant professor of Biomodeling and Bioinformatics, Department of Biomedical Engineering and ICMS

## Synthetic DNA: is it dangerous?

**Creating DNA molecules - the carriers of genetic information - from synthetic material has been possible for a while now. Today, synthetic DNA is especially used to prevent theft by marking products, or brandish perpetrators with a DNA shower. Last week however, English researchers published an article in Science in which they claim to have created a protein that can convert synthetic DNA into natural DNA and vice versa; it's the next step in synthetic biology. What are the possibilities of this new discovery, and more importantly: what are the risks? How close are we to creating an independently functioning synthetic genome?**

"Synthetic biology is a hot topic at the moment. Many researchers are working on synthetic biological systems. Of course, DNA is special because it codes genetic information, and the combination of the words synthetic, DNA, tinkering, and lab easily result in horror stories", says Tom de Greef, assistant professor of Biomodeling and Bioinformatics at the Department of

Biomedical Engineering and the Institute for Complex Molecular Systems (ICMS). "DNA is a molecule that consists of two strands of building blocks - nucleotides A, T, C and G. These letters are coupled to the so-called backbone of sugars and phosphate groups. In the nineties, researchers managed to create XNA (xenoDNA) with different letter codes, or more than four letters. They also synthesized DNA with different backbones, such as PNA and GNA. The XNA used by the English researchers, despite having the standard letter code, is different as far as the backbone's genetic makeup is concerned. They tested six types of XNA in total. With the help of smart molecular biological techniques they managed to create enzymes that can convert XNA into regular DNA and the other way around. And that conversion is nearly flawless with a single enzyme's copying error at 99.6 percent. That's extraordinary."

"I think it's an amazing paper, but I do have a few tentative remarks. For example, they did not create conversion

enzymes for the most common XNA backbones PNA and GNA, and I don't see why not. Maybe the smart molecular biological techniques didn't work for those XNA types? On top of that, it's not an actual synthetic system. The XNA replicates through the DNA; they haven't been able to create enzymes that can replicate XNA independently the way that happens with DNA. The risks of this XNA are therefore close to zero. And as long as there are no biochemical pathways to make those XNA building blocks, an XNA-based cell can only grow if we manually add the modified building blocks."

"XNA can be very helpful as a way of therapy with certain diseases. The researchers indicated all six types of XNA could potentially inhibit the new production of specific proteins, including pathogenic proteins. The question is, however, whether or not XNA will actually be absorbed by the cell, since that's a prerequisite for it to work. And DNA - and in the future possible XNA as well - is being used



Dr.ir. Tom de Greef. Archive photo | Bart van Overbeeke

in nanotechnology more and more, for example for the production of advanced drug-delivery systems. Using DNA origami, DNA strands are folded into complex 3D shapes that can administer certain types of drugs to the body. Our group is also talking about using DNA origami for medical purposes. Other things we're currently working on in the field of nanotechnology that involve DNA is the development of biochemical circuits that can process signals, also known as DNA computing. These DNA computers could potentially become just as fast as regular PCs and they're easily integrated with organic matter. We're still in the earliest of stages, but it could result in beautiful things. Another advantage of XNA concerning these two uses is that it's not recognized by natural degradation enzymes, which is something I'm

especially excited about." "The chance to accidentally create something unwanted with this XNA is infinitely small, but not zero. I think it were best if people made arrangements regarding the boundaries of xenobiology, and maybe even install legal limitations for the future. You wouldn't want the wrong people fiddling about at home in their makeshift labs. After all, should someone create xeno-organisms that replicate completely by themselves, we'd sure have a problem. On the other hand, it would pose an interesting social problem: how will mankind react upon finding out our genetic material is in fact not unique, and life can be created with other molecules as well? That might cause the same shock as did the discovery the earth wasn't the center of the universe, or that man evolved from ape. It makes me wonder..." (NT)

## Tech United wins RoboCup Dutch Open 2012

On Sunday, April **29**, Tech United Eindhoven managed to win the unofficial European title for robot soccer teams in their hometown for the **4th** time.

Since **2007**, TU/e has been participating in the European and World RoboCup tournaments, a soccer competition that was founded in **1993**.

All **8** matches played by Tech United were won by the Eindhoven Team that scored **34** goals and conceded only **4**.

In the final, Tech United beat the solid Iranian team MRL with a **3** to **2** score.

From April **25** through **29**, **5,500** visitors occupied the bleachers of the Indoor Sports Center at the Aalsterweg. With several TV broadcasts, the tournament has reached approximately **2.7** million enthusiasts.

Tech United and their care robot AMIGO also won the @Home League. **4** teams competed in that competition. (HK)



Photo | Paul Bloemen



# The man who holds out: “Frappez toujours”

Text | Norbine Schalijs  
Photos | Bart van Overbeeke

**For two years now Arno Peels has been chairman of the TU/e Executive Board. Whilst almost absent in the national media, he manages to get many things done in the wings, is what people around him think. Despite showing a measure of impatience, he is willing to persist in matters that require tenacity. He is famed for his networking capacities. “But we don’t discuss any private matters.”**

“That Brainport has been nominated the smartest region in the world, is greatly thanks to Arno.” Eindhoven’s mayor Rob van Gijssel is quite decided in his statement. Most of his contact with Peels is due to their membership of the Brainport 2020 foundation board. “Arno has fleshed out the focus areas ‘people’ and ‘technology’ adequately. And it is great that he has decided to create a distinct profile for TU/e in the three strategic areas Energy, Health and Smart Mobility: bingo three times! I also value him for opening up the campus. TU/e is no longer an impregnable fortress.” Van Gijssel, interviewed while driving to The Hague, applauds the regional, national and international contacts that Peels maintains or sets up. The men meet several times each month. I myself find him very accessible. A pleasant person.” Ruth Oldenziel shares that opinion. The professor of the History of Technology says that the expression “Frappez toujours” might have been written for the chairman of the taskforce “Talent to the top”. “He emphasizes continuously that TU/e should have more women. Although he wants to speed things up and score, he does understand that this is a subject that requires patience and persistence. It calls for a cultural shift.” When asked whether Arno Peels shows an interest in her own research, the professor bursts out laughing. “No, but I don’t know either whether I can expect that. It would be nice.” Just like the other people quoted in this article, Oldenziel hardly knows the Executive Board chairman personally. “I don’t know if he has any hobbies. I do know he is a Francophile. I once talked to him about his role as a father, because I share the same concerns as a mother of a teenager.”

**“I value him for opening up the campus”**

Clement Goossens, who is responsible for government relations at TU/e, is not even aware that Peels has any children. “We never talk about that.” Twice a month he consults with Peels to discuss contacts with the government. Those meetings are always dealt with efficiently.

Peels has all the relevant files at hand, and Goossens also has a list that he wants to discuss in the allotted thirty minutes. “If he asks about my holidays we keep it short. We do not talk about the way we spend our leisure time. I’m not like that myself either - we just set to work.” And that is what Peels wants as well. He likes to cut knots and quickly makes it clear when there’s something he doesn’t like. Rokus van Iperen, chairman of TU/e’s Supervisory Board (RvT), thinks that Peels has made a flying start: “Arno cooperates very well with the other Board members, has a good relation with the RvT and is implementing a number of important projects for TU/e together with his colleagues, such as the new Bachelor program. The strategy with the three main themes (Smart Mobility, Energy and Health) enjoys wide support within as well as outside TU/e.”

**He quickly makes it clear when there’s something he doesn’t like**

When asked, Oldenziel remembers that a venomous column was written when Peels was director and CEO at Thales Nederland. “He did mention his position at that time once. Because of its scale, he finds TU/e a more congenial organization than the big multinational company that he used to work for. Where he charted a course as executive and where the head office decided otherwise without any consultation whatsoever. The academic climate at TU/e did take some getting used to, for that matter. Professors have opinions of their own and will voice them. A university is less hierarchical than a multinational. That is an aspect he rather likes about it”, says Oldenziel. Rinus van Weert, former chairman of the University Council, also had the impression that Peels needed some time to settle in. “He made a modest and quiet entrance at TU/e. At first instance he seemed a bit bashful to me. Still, he had worked up all subjects of the meeting carefully and was able to reply quickly.” Yes, there was the occasional clash between the two men, but only

about such a minor thing that Van Weert can’t even remember the subject anymore. “Peels curtly said ‘No, that is not on’ to a proposal from the Council and we simply had to accept that.” The big difference with his predecessor -Amandus Lundqvist- is that Peels is so approachable, says Van Weert. “I found Lundqvist more aloof. Peels is more jovial. He will come towards you.”

**“Hi, I’m Arno. Would you like a beer?”**

What Van Weert appreciates highly is Peels’ involvement with TU/e students and staff. When in January 2011 the University Council went on an offsite retreat for two days, the chairman of the Executive Board was invited -“almost against the Council’s better judgment”. “And he showed up!” Just like he did at Van Weert’s farewell reception. “I was pleasantly surprised.” Someone else who was pleasantly surprised was Biomedical Engineering student Sandra van Tienhoven when she noticed that Peels recognized her at the opening of the academic year 2011. She had already met him in meetings of the University Council, where she was then chairwoman of Groep-één. “Peels walked up to me in the tent in front of the Hoofdegebouw, introduced himself to my friend, “Hi, I’m Arno”, and then asked: “Would you like a beer?” She thinks it is sharp that he should know exactly who the students in the University Council are. “He sees so many people in a week, I imagine that the only thing he does is talk and attend meetings, and the composition of the University Council also changes regularly.” Thomas Reijnaerts, who was on the Council for PF in the first half of 2011, wonders whether ‘ordinary’ students, who are not on boards or executive committees, actually know who Peels is and what he does. As far as Reijnaerts is concerned, Peels could generate more publicity for TU/e. “If we do things right, publicity will come your way automatically, is the old-fashioned idea. I don’t have the feeling that Peels is trying to change that culture. Maybe he is, but I can’t see it.” Another thing Reijnaerts doesn’t see either, is a lot of humor. “Then again, this may be due to the fact that it is Harry Roumen who makes the jokes in the University Council.”

The funniest thing Van Gijssel knows about Peels, is that he blushes. “Which makes him easy to catch out. When he feels uncomfortable or does not like something, he blushes.” For the rest the mayor mentions the fact that they grew up in the same neighborhood. “In the same street in Stratum. But we went to different schools, me to the

Nutsschool, he to the catholic primary school. We did not play together either. I don’t know how many children he has.

Nor do I ever see him with his partner. We don’t discuss private matters.”



*Unfortunately not everybody could/wanted to cooperate on this portrait. We would have liked to talk to Peels’ direct colleagues within the Executive Board, and his secretary and spokesman, so as to give a fuller picture of the Executive Board’s chairman.*



# The psychological battle against litter

**It is a source of great annoyance and its removal costs loads of money: litter. In spite of deposit money, fines and information campaigns, the problem still persists. Researcher Ron Broeders is trying to find out how people's behavior may be influenced unawares, so that they no longer carelessly discard cans, PET bottles, chewing gum and cigarette butts. After intensive experiments in the lab, he will put things to the test in June. At a location in Eindhoven's city center that will remain strictly secret.**

Just tossing away litter is unsocial behavior, and every citizen knows this. Nonetheless it happens every day. "The authorities try to enhance awareness in particular through information campaigns. However, people often do things unconsciously, out of habit, without thinking. That is why information campaigns alone are not enough", social psychologist Ron Broeders assumes. He is a scientific researcher affiliated with the Human-Technology Interaction (HTI) group of professor Cees Midden (Department of Industrial Engineering & Innovation Sciences).

Commissioned by the Nederland Schoon foundation and the municipality of Eindhoven he has since 2010 been studying the processes inducing people to deposit litter in litter bins yes or no.

## A glossy Chinese character as translation of a synonym of clean

His approach is to influence people's behavior by means of interventions that link up with automatic and unconscious processes, so that the huge pile of litter in the Netherlands will diminish.

An example in kind is the research into the association between the perception of gloss and the concept of clean. Broeders: "Objects that have just been cleaned will often gleam. You could say that if people are exposed to this combination frequently enough, an association will develop in their minds between the perception of gloss and the concept of clean. If this is true, you would expect people to respond faster to synonyms of clean that are represented with a glossy typeface." He checked this assumption with an experiment in the HTI lab. The subjects were shown words on a monitor, which were alternately printed in a glossy or matt typeface. "We discovered that people that are confronted with synonyms of 'clean' classify the word faster as belonging to the concept of clean when it is represented in glossy letters. For 'dirty' the exact reverse is true." In order to replicate this result, a second test was conducted in the lab. This time the subjects were told that it was being researched to what extent people who

do not know any Chinese are capable of translating a Dutch word into Chinese correctly. In reality this experiment was again about the influence of gloss. And again it involved Dutch synonyms for the concepts of dirty and clean. Broeders: "The result? People choose a glossy Chinese character more than they would if just guessing, when faced with the choice between both a glossy and a matt Chinese character as translation of a synonym of clean."

Although for Broeders this constituted a confirmation, he wanted to show with a third experiment that the association between gloss and clean is not only in people's minds, but that this association also translates to people's unconscious behavior. "We have invited people for a 'taste test'. They had to test rusks covered with two different kinds of fruit sprinkles. They were told that this research was conducted for a manufacturer who wanted to put one of the two kinds on the market. Actually we were interested in seeing the subjects' behavior if the sprinkles started to fly in all directions."

One rusk with fruit sprinkles was presented on a shiny tabletop, the other on a matt tabletop. In both situations the subjects began to clear up the mess, rusk crumbs with fruit sprinkles. Which Broeders finds quite understandable, as the experiment took place in a laboratory that was clean otherwise. "In the case of the shiny tabletop, however, cleaning was done faster and more intensively. The testing of the rusks on a shiny tabletop also lasted longer. In other words: the subjects acted more carefully so as not to spill anything."

Having listed these findings, Broeders thinks it is high time to 'come clean' in a situation outside the laboratory. Field research will follow in the month of June, 'somewhere' around some shops in the city center of Eindhoven. He cannot give any further clues, for that might jeopardize the research. For the same reason the researcher cannot divulge how the experiment will be carried out exactly. In this respect the world outdoors is more refractory than a laboratory", Broeders sighs. According to him it was quite a job to find a suitable location. "Is there enough social traffic? Is there enough litter? How are we going to measure things, with cameras or observers? That will take a good deal of reflection and consultation."



Ron Broeders. Photo | Bart van Overbeeke

For a period of three weeks observers from an external bureau will closely monitor both 'hot spots'. They will not only study the behavior of passers-by, but will also keep a tally of the litter and analyze it. Their findings will be entered into preprogrammed PDAs. The data will be studied later.

## "What is value? That's the key point"

After all, Broeders's research is not only limited to the effects of a shiny environment. Simultaneously, studies are conducted into the influence of norms and the psychological value of objects. "Very often an appeal is made to awareness of sustainability, immoral

conduct, but what you should really try to appeal to is that the majority of people disapprove of unsocial conduct. Which is something we've known for much longer, in fact. We are doing a great many things because other people do them. We don't reflect all day long on all sorts of decisions. A rule of thumb used by most people is to do what the majority does. Me too. Well, we've integrated this into a standard for both general litter and cigarette stubs. Measurements we have conducted at big bus platforms in Hoofddorp and Haarlem seem to suggest that standards, in the form of a poster with a text, don't have such a big effect on general litter. Whereas this does appear to work for cigarette stubs."

There is a lot to be gleaned also from the study into value, Broeders suspects. Objects of little value are tossed away

more easily. Especially if someone is in a 'valueless' environment. "What is value? That's the key point. Rarity, age, history, popularity or the weight of an object can determine that. A light, plastic cup may soon be thrown on the ground for that reason. In some respects this is entirely contrary to current developments in the packaging industry at present. The trend is for everything to be lighter and cheaper. As a result, though, the packaging may be assumed psychologically to represent less value and might be tossed away sooner. While a lighter packaging may be cheaper for manufacturers, the costs involved for society in cleaning up the rubbish may rise considerably."

Text | Frits van Otterdijk