

4

Cursor

October 20, 2011 | year 54



Biweekly magazine of the Eindhoven University of Technology
For news: www.tue.nl/cursor and follow tuecursor on Twitter and Facebook



4 | Do the Dutch Design Week

2 | Flashback

3 | How green is our energy

6 | Eye on improvement

i Colophon

Editor in chief
Han Konings

Executive editor
Brigit Span

Editorial staff
Judith van Gaal
Tom Jelles | Science
Frits van Otterdijk
Norbine Schalijs
Monique van de Ven
Enith Vlooswijk

Staff
Fred Steutel
Nicole Testerink
Gerard Verhoogt

Photography
Rien Meulman
Bart van Overbeeke

Cover
Tim van der Grinten

Translation
Annemarie van Limpt (pages 1-2-3-6)
Benjamin Ruijsenaars (pages 4-5)

Layout
Natasha Franc

Affiliated with
Hoger Onderwijs Persbureau

Editorial board
prof.dr. C.J.H. Midden (voorzitter)
prof.dr. J.W. Niemantsverdriet
mw. A.C. Stevens-van Gennip
T.H.J. Reijnaerts (studentlid)
A. Roestenburg
Anneliese Vermeulen-Adolfs (secretaris)

Address editorial office
TU/e, Laplace 0.35
postbus 513, 5600 MB Eindhoven
tel. 040 - 2474020,
e-mail: cursor@tue.nl

Cursor online
www.tue.nl/cursor

Print
Janssen/Pers, Genep

Advertisement
Bureau Van Vliet BV
tel. 023 - 5714745



Realistic consultations?

Employee participation is a great asset at universities and can be found scattered around campus, although often well-hidden. Last week, I joined the Service Council on a two-hour quest at the floor of our personnel department. It was a working visit of said council and every now and then its members were asked about the exact nature of the Service Council. For this body, unknown unfortunately also means unmanned.

Recently I had an interview with Executive Board member Jo van Ham and University Council (UC) chairman Rinus van Weert. Look at it as our contribution to provide UC with at least some exposure prior to the December elections. It didn't lead to fireworks or anything, but that's not how we treat each other in public anyway. Although sparks used to fly in the old days. I liked the fact that last Monday Van Ham appointed himself as an advocate of 'realistic consultations'. During the UC meeting barely three hours later he presented the student parties with an ultimatum regarding the budget cuts for board grants. The students, fairly shell-shocked, were told there was no way around halving the budget. Any other amount was not up for discussion. Was that to set a shining example of realistic consultations for them, really?

The Cabbolet case

Late September, Marcoen Cabbolet received his PhD from the Vrije Universiteit Brussels. Summa cum laude, no less, although nearly four years ago practically the same dissertation was rejected by TU/e at the last minute. Fascinating. Cabbolet graduated as a chemist, developed a physical theory, wanted to do his PhD at the faculty of humanities in Tilburg, lingered at the department of Mathematics in Eindhoven, and now holds a PhD in Philosophy and Moral sciences. The one conclusion that forces itself



upon us is that some major misjudgments have been made. Is this the drawback of the rise of interdisciplinary research?

TU/e Technische Universiteit
Eindhoven
University of Technology

© 2011. All rights reserved. No part of this publication may be reproduced without prior consent of the editor-in-chief. The editorial staff reserves the right to alter submitted articles.

◀ 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?

Executive Board cuts board grant budget by nearly half

October 19, 2011 - The two student parties within the university Council, Groep-één and the Progressieve Fractie say the cut for board grants of nearly a quarter million euro are

disproportionate and refuse to agree to the plan. The Executive Board is sticking to it and will only talk about a new distribution of the grant system.

Champions League among grants for two professors

October 18, 2011 - Both prof.ir. Ton Koonen and prof.dr.ir. Meint Smit (both of Electrical Engineering, COBRA research school) have received an Advanced Grant from the European

Research Council (ERC). The grant is meant for senior researchers in Europe and is worth nearly 2.5 million euro per grant.

Failed PhD candidate Cabbolet avenges himself in Brussels

October 13, 2011 - On September 23 last, Marcoen Cabbolet received his PhD from the Vrije Universiteit Brussels. He received his doctorate 'with highest honor'. In 2008, his PhD research at TU/e's Department of Mathematics & Computer Science was cancelled at the last minute after the controversial nature of his study surfaced in an interview with Cursor.

The contested dissertation introduces Cabbolet's 'Elementary Process Theory', an all-encompassing theory based on the assumption that antimatter is repelled by the gravity field of normal matter. Should Cabbolet's theory prove correct, that would have serious consequences for the validity of both quantum mechanics and the theory of relativity itself.

Joint introduction day for new students in Eindhoven

October 11, 2011 - New students in Eindhoven will be treated to a joint introduction day next academic year, which will focus on getting to know the city especially. TU/e, Fontys and

Design Academy announced their plans last Wednesday, October 12. What the Eindhoven Student Day will come to look like exactly is yet unknown.



◀ Flashback

Auditorium 1966 versus 2011

Since its erection 46 years ago, the outside hasn't changed much. But take in its surroundings! Until some fifteen years ago, there was still a large, square pond on the south end of the Hoofdgebouw. Today only the concrete blocks remain, which are hardly ever used by students to sit on, surprisingly. The water has been drained and the hole has been filled with sand back when dr.ir. Henk de Wilt was still Chairman of the Executive Board (1996-2002). Because he wanted to give the university a more open quality, much of the shrubs and trees had to make way, and what was once a pond was turned into a multi-purpose lawn. In the year 2011, there is talk of putting the pond back in the Groene Loper. Ing. Boudewijn Elmans, project manager at Real Estate Management insists the plan is still in its initial sketching phase. "Maybe there's all sorts of intricate infrastructure beneath the surface which makes the plan impossible." (NS)

Photos | IEC Archive and
Bart van Overbeeke



≡ Clmn Ladies in science and technology: why and how?



Sometimes I can't get rid of the feeling that I study at West Point Academy. Indeed, most programs at TU/e are attended by male students. It explains why one of the aims of 2020 Strategic Plan is to attract more female students and teachers. However, before going all the way to achieve this goal, we need to find answers to two important questions: why and how. Surprisingly, while reading relevant publications I couldn't find a clear and well-motivated answer to the question "Why do we need more female students in technology?" I found some abstract ideas such as "gender diversity" or "programs' social profiling". I gathered we want to increase the influx of female students in order to ... increase the influx of female students. If that assumption's correct we have other, more important, problems to solve first. OK, suppose we have found the answer to our previous question. Then still, there's the problem of how to achieve our aim. Facilitating positive discrimination wouldn't be the best solution because discrimination is bad for either gender. Science is not a sport and having stronger muscles is not an advantage anymore. Moreover, I'm sure that most women that have been accepted at TU/e wouldn't want to be considered weaker students and would demand equal treatment. None of them wants to hear: "She's studying here not because she's smart but because she's a girl." So we must try and promote technical education and motivate potential female students starting at elementary school. For example, I attended Tech United team's fan night. At this fun event many little 10-14 year-old girls were fascinated and I'm sure returned home with the idea that "Robots are cool!" In my opinion, that how it should work if we want our technical community to be more diverse.

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

Vox Academici

Prof.dr. Philip de Goey, theme leader Future Fuels, Eindhoven Energy Institute (EEI)

How green is our energy?

Last week the Rathenau Institute - research and debating center for technology, science and society - published a survey of our (future) energy options in the book 'Energie 2030 - maatschappelijke keuzes van nu' (Energy 2030 - today's social choices). Its conclusions are quite shocking. Although more and more green-energy projects are being set up, our energy supply is becoming ever more polluted. The use of fossil fuels isn't diminishing, on the contrary: we're using more and more of them. What is the problem in reducing the energy consumption, exactly? Do we even want to change our lifestyle? What are the fuels of the future? And what does green actually mean?

"It's so easy to say we'll all change to green energy, yet in actuality it's not that simple", says Philip de Goey, dean of the department of Mechanical Engineering and involved with the current energy issue as EEI's program leader Future Fuels. "We're using an enormous amount of fossil fuels and due to countries like China and India's

strong economical growth, it will only keep rising. Industry and transport are big energy consumers. According to scientifically underpinned expectations, energy consumption will remain on the rise until 2050, and only after that a drop will set in. It's the enormous global demand that's the problem. Because I think we're not doing too bad as far as awareness is concerned. Take the 10:10 climate day: TU/e managed to save a lot of energy. So we know how it's done. And every little helps, such as traveling by bike instead of taking the car. Still, individual consumption is negligible compared to that of the big industries..."

"The current market is not yet ready for alternative fuels. Time is needed to be able to handle the high demand. A few windmills won't get us anywhere. Today, alternative energy sources only make up a few percent of the total energy supply. It's too little and has to grow. People are now working on the conversion of coals or biomass into fluid fuels, but to really contribute to the process, the consumption has to be at least hundred times of

what it is now. The time it will take to build the factories necessary? Time is not on our side here."

"As far as other alternatives are concerned - biomass, sun, wind - we also have to pull out all the stops. The sector is constantly innovating to expand their position in the market. Within EEI, many studies are conducted to contribute to innovations in the field of renewable energy as well. The theme group Future Fuels is looking into replacement fluid fuels. An airplane or ship doesn't work on electricity, unfortunately... It's why we're currently searching for ways to replace fossil fuels by solar fuels, for example. The entire chain should be as clean as possible. Although right now it's mostly fossil fuels that are burnt, I have to say their consumption has become much cleaner over the years. Rules and regulations have led to a steep reduction of nitrogen dioxide, sulfur dioxide and particulate emissions. That way, there's a hint of green in grey energy as well."

"Lately, we've been hearing more and



Philip de Goey. Photo | Bart van Overbeeke

more questions on the green aspect. For example, for biomass such as palm oil forests are being cut down, which affects the food chain. It's better to use biomass waste streams, because there are plenty of those. There's still a lot to

be done before these supplies can be used to generate energy on a large scale. Green has the future, but only if it's really green." (NT)

Tenth luster chapter Aleph

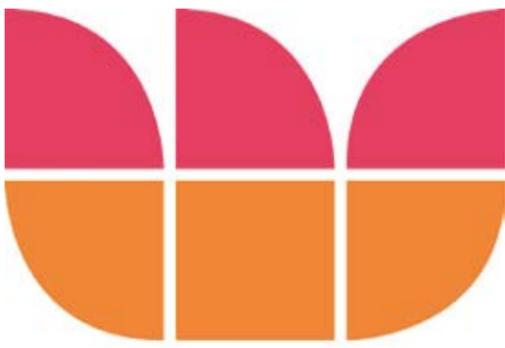


Photo | Rien Meulman

9 horses pulled a coach and four carts to transport Aleph members from their ESC quarters in the Bunker to their chapter house in the Guido Gezellestraat.

For **50** years, members of ESC chapter Aleph have lived in the house, 142 in total. 120 ex-residents attended the reunion of October 8, 2011.

23 times during speeches by alderman Henk Brink and several Aleph members, attendants cheered 'Bravo!' And 12 times, interruptions were cut short by members shouting 'Silentio!'



DUTCH DESIGN WEEK EINDHOVEN 22-30 OCT 2011

Do the DDW!

Dutch Design Week | Nicole Testerink

From October 22 thru 30 the Dutch Design Week (DDW) will be celebrating its 10th anniversary and Eindhoven can call itself the design capital of Europe. TU/e is also involved in numerous events. These take place on the university campus and also at various locations in the city. Part of the activities will be presented on the following pages. Compose your own program on ddw.nl in order to make your DDW round trip!

Architectural feats on graduation show architecture.ehv

Architecture, Building and Planning is bubbling during the DDW, offering a highly varied program full of lectures, workshops, installations and the exhibition architecture.ehv. The best graduation projects from the various specializations within this Department may be seen here. CASA committee member Loes Veldpaus: "Within just a few years we have evolved into a fully-fledged exhibition which is highly appreciated by the public at large."

This year, too, CASA Vertigo -the special activities programming committee of Architecture, Building and Planning- is providing a big graduation exhibition. In addition to architectural projects, research is shown from the other specializations: structural design, building technology, physics of the built environment, construction management, design systems and urban design and planning. A platform for students to show their work, and at once a reflection of the breadth of the study. A big difference from preceding years is the manner of presentation. "Students have a table and a poster with total freedom of arrangement, for not all designs



are suited for a scale-model. This implies you could also come across video presentations" explains student assistant Dagmar Cats.

Together with Loes Veldpaus and Rob van Wendel de Joode, among others, she is involved in the organization. "We have also made the exhibition more interactive. During Pitch your Project, on Friday October 28, every student has three minutes at most to present the graduation project and convince the audience of its quality. Both a professional jury award and a public award will be presented, and we are very curious." Rob van Wendel de Joode thinks that Vertigo will be the place to be on Friday October 28. "After the graduation presentations the nominations for the international architectural Archiprix award will be announced. Following on that there will be the final presentation of elir 2011 - giving luster to the rust."

In the elir 2011 project 42 international students from 7 different universities will get cracking on the refurbishment and reuse of five former industrial zones in Brabant. Organizer Tom Veeger: "Apart from generating ideas to come up with a new designated use for the place, we shall also tackle the practical side. For instance, we are going to visit a concrete factory and students are going to bake their own bricks. In this way the possibilities and the limits of a material may be explored." The progress of the project can be inspected every day by the public. In addition, lectures will be presented by various foreign experts on October 26 and 27.

<http://tue-elir.nl>

Calendar

October 22-30

Architecture.ehv – exhibition of the best graduation projects
Plaza Vertigo

The cloud collective - projections in the air: alternative conditions of the spatial design
Vertigo stairwell

October 28

Pitch your project – cast your vote for your favorite graduation project
13.00 Vertigo stairwell

Announcement of nominations Archiprix and public jury
16.00 Vertigo stairwell

Final presentation elir 2011 giving luster to the rust
17.00 Vertigo stairwell

TU/e designs mobile pavilion Brainport

Brainport needs a traveling pavilion. A platform that can be installed simply and constructed quickly to serve as a podium or exhibition space for the events that are organized within and outside Brabant. This was the assignment on which thirteen students of Architecture, Building and Planning set to work a year ago, which resulted in different designs. In the end a project group was formed that developed the designs further. And now the definitive design will be displayed during the DDW.

"Scalability is an important factor brought out in the design", explains Tim van der Grinten, a student of Architecture, Building and Planning. Together with three other students he occupied himself with the Brainport Pavilion in the past few months. "Thanks to the separate units it is possible to build a small as well as a big pavilion. Otherwise we have reached the limit of our technological options, with wall panels that combine music, light and architecture to form one harmonious whole. The design is constructed in such a way that it can grow along and continue to be high-tech." October 27 will see the official presentation of the design inside the Town Hall. Which is also where members of the design team may be found every day during the DDW for any questions there may be about the new Brainport Pavilion.



Illustration | Tim van der Grinten

Calendar

October 22-30

TU/e Master project Brainport - design mobile pavilion
Eindhoven Town Hall

Design Cares: innovative design in care and well-being

How can we as designers look at the increasing demand for care? How can we develop products that may help to improve people's sense of well-being? These questions occupy center stage at the exhibition Design Cares, which heralds the start of a joint venture between TU/e, the Design Academy and, at a later stage, Aalto University in Helsinki in the area of healthcare and well-being. In the end the reinforcing factor must result in designs that can improve the healthcare sector.

"Very frequently the complaint is heard that there should be more hands at the bedside, but we think that there are other options as well to solve problems in the healthcare sector. We are making that very clear indeed in the exhibition Design Cares", says Miguel Bruns Alonso, assistant professor at Designing Quality in Interaction and co-organizer of Design Cares. "Within the context of World Design Capital 2012, TU/e, the Design Academy and Aalto University in Helsinki have joined forces so as to realize innovations in healthcare and well-being jointly. This is a very



broad area - ranging from personal hygiene, sleep and nourishment to the social aspects around healthcare and well-being. Design Cares shows a number of different examples. A shirt that indicates when a person working on a computer is too cramped, a design for providing support during a mammography so that the patient is

more in control of the examination and a product line of baby electronics adjusted to today's young parents."

Bruns Alonso thinks that the different approaches of the different institutes become very obvious at the exhibition. "We are showing more of a vision and underpin by means of prototypes how this may be implemented, whereas the Design Academy focuses more on the final product and its finish. It is precisely this difference in focus which ensures that we can deliver high-quality products in the future."

Calendar

October 22-30

Design cares

11.00-19.00 YKSI expo Strijp 5

Relaxed parents thanks to colorful baby intercom

Together with three fellow students Alice Beukering wanted to design a product that can provide rest for a young family. "Although a baby comes with a lot of stress, we want to emphasize that enjoyment should be central." Client DUUX wanted to get a new view of today's baby electronics, after which Alice and her colleagues came up with a new product line. The Ambient Baby phone works with colors, which generate a more relaxed atmosphere than sounds. They also designed Timeless Yellow - a design that can visualize the concept of time for young children in a physical manner - and a concept for exchanging baby experiences with one's environment.



Future visions of young designers

Through their work displayed at ID'11 newly graduated ID students want to show how they can change the world. Excellent projects from Bachelor and Master students are exhibited there as well. Future vision and innovative design come together.

"This year we want to show how, as ID, we link up with the strategic areas of TU/e", ID communications officer Jeanette Schoumacher explains. "That's why we have split up ID'11 into five units with a common theme: Health & Well-being, Intelligent and Poetic Environment, Social Interaction, Individual Skills & Identity and Sustainable Society. For visitors this will be an opportunity to explore the diversity of our Department. It has turned into quite a varied exhibition featuring many interactive prototypes and surprising designs. There's something to suit all tastes."



Artistic photography with an extra dimension

Being a passionate photographer, Gordon Tiemstra thought that you should not only be able to share pictures via social media: he wanted to take things a step further. His Apollon project is intended to exchange the underlying experience also. "Every day so many photos and films are exchanged via Facebook, Hyves and Twitter. As a designer I always wonder: where will this lead in the future? The experience of an event is becoming more and more important. By means of the cameras that I have developed you can add an extra dimension to a social event. The devices are interconnected and yield pictures with different perspectives, thus adding an artistic twist to the whole event. Just think of it as a new form of playful photography."

Comforting premature babies from a distance

At the Máxima Medical Center staff became aware of the problem in the maternity ward that parents cannot constantly stay in touch with their premature babies. They posed this problem to ID, where Misha Croes set to work to improve the contact between newborn babies and their parents. "It is important for parents to have a lot of contact with their child in order to strengthen the bond between them. In case of premature babies this is often awkward." Misha designed FamilyArizing, a method that no longer leaves parents empty-handed. "By means of a medallion the parents are connected to their baby's mattress. It allows them to feel the movements their baby is making. Conversely, they can also activate the mattress, which can adopt the shape of a cocoon. It is hoped that the baby will feel protected as a result." Earlier this year Croes won both the ZonMW Studentenparel (Student Pearl) and the Scriptieprijs Innovaties in de Zorg van FWG (Final Project Prize Innovations in Healthcare) with his final project report on FamilyArizing.



World yachtsmen researching

As Jop Japenga was interested in the relation between design and research, he ended up at the Interactive Institute in Stockholm. There they were conducting a project in which sea yachtsmen during their voyage can gather data for ocean researchers. "We were keen to design something that would help involve the general public more in research, in this case ocean research. By equipping a yacht with all sorts of sensors and then linking the measured data with the sailing adventure, you get a lovely triangular relation between design, researcher and 'ordinary humans'. To that end I have developed a platform, making it possible to link these people. By now the first private yacht with sensors has been under way for two months. We hope that more boats will join in within a short period of time, so that we can actually set up the Ocean Search platform."



Calendar

October 22-30

Exhibition ID'11

10.00-18.00 hall Hoofdgebouw

Exhibition Design United kick-off for new platform 3TU

In a joint exhibition the 3TU shows that its mutual cooperation and its cooperation with the industry can result in trail-blazing designs in which the user is the central point. This exhibition has a festive touch because of the launch of a new platform with a similar name: Design United.

At the exhibition, researchers will get an opportunity to present their research results and concepts to the public at large. In practice the different focus of the programs proves to be effective in the solution of various social issues. Whereas TU/e focuses on intelligent systems, Delft is looking at the user in particular and Twente takes care of the marketing part. Various examples of the 3TU teamwork are on display, such as the i-PE (Intelligent

Play Environments) project, in which people are stimulated playfully to exercise more. It is not only good for combating overweight, but also fosters social interaction. The exhibition is the start of various activities to be organized by the new platform. Thus, there will be round-table talks, colloquia and visits to companies so as to keep encouraging the interaction between research and the business community.

Calendar

October 22-30

Design United

10.00-18.00 first floor Hoofdgebouw

www.designunited.nl

October 26

Conference design as service - the role of design in product service innovation

9.30-18.00 Auditorium TU/e

www.designasservice.nl

Surgery robot with eye on improvement

A remote control robot that enables eye surgeons to operate quicker, more accurately and without trembling. It's what the EyeRHAS project has in mind. Ir. Thijs Meenink designed a compact robot that can be easily attached to the operation table. He'll be receiving his PhD on the subject on Monday, October 31.

By the end of the interview, ir. Thijs Meenink is beaming. He's been talking about how his eye surgery robot has come to materialize in the past months. After years of designing, the moment came that all parts were ready and everything turned out to fall into place. The setscrews turned as smoothly as a radio knob, exactly the way Meenink had anticipated. "And the clamp that fixes the robot tightly secures everything with several hundred Newton. Still, it's easily shifted. It was wonderful to see everything work so well." The shiny robot is on display under a glass bell-jar in his office.

Everything literally revolves around the point the instrument pierces the eyeball

Four years ago, the Mechanical Engineering student was given the opportunity to become the second PhD candidate within the EyeRHAS project, which had to produce a robot for eye surgeons to carry out so-called vitreo-retinal eye surgery - operations performed on the retina and the fluid behind the eye's lens. Eye surgeon prof.dr. Marc de Smet (AMC) initiated the project in which TNO is also an important player. Last spring, dr.ir. Ron Hendrix received his PhD. He had started on the development of the robot's master console a year before Meenink (covered in Cursor 22 of this calendar year). The console enables the surgeon to control the robot's slave component that - rather than the surgeon's hands - manipulates the instruments to suck up fluid or fix part of the retina. Meenink: "Because I have started on the project after Ron, the slave wasn't ready for his PhD. Because of that, the master was initially hooked up to another operation robot that was also

designed in this lab." It was quite a success: for the development of that other robot, SOFIE, PhD graduate dr.ir. Linda van den Bedem was awarded the prestigious Simon Stevin Fellow this month.

Whereas SOFIE is an all-round operation robot, Meenink designed the EyeRHAS robot specifically for eye surgery: "Everything is as small, lightweight and accurate as possible. The instruments are half a millimeter in diameter." The small diameter is no luxury, since they're supposed to fit through a tiny hole in the eyeball in order to do their job. The robot should substantially lengthen the eye surgeon's active career, says Meenink: "By the time a surgeon is allowed to actually operate, they're well past thirty. By the time someone reaches fifty, their hands are usually shaking to the point where operating becomes irresponsible." The trembling can be easily filtered by an operation robot, however, so the slave can do its work tremble-free.

Apart from that, the surgeon's movements are also scaled back: every centimeter the surgeon moves the master console, for example, is reduced to a movement of a single millimeter of the tweezers at the end of the slave's 'finger'. "It makes for a much more accurate movement", says Meenink. "And the master is equipped with force feedback. Today, eye surgeons rely solely on vision, since the force they exert is too small to actually feel. The robot can gauge that force and provide enhanced feedback. That way, surgeons can feel what they're doing." Meenink designed the robot so everything literally revolves around the point the instrument (small tweezers, scissors, a scraper, sucker or laser) pierces the eye. From that point, the robot's finger can move in four directions (see image). "You want to avoid the instrument to exert lateral pressure to the eyeball at all costs. For that reason, I balanced the robot arm so it stays in position should the power fail. And it can always be

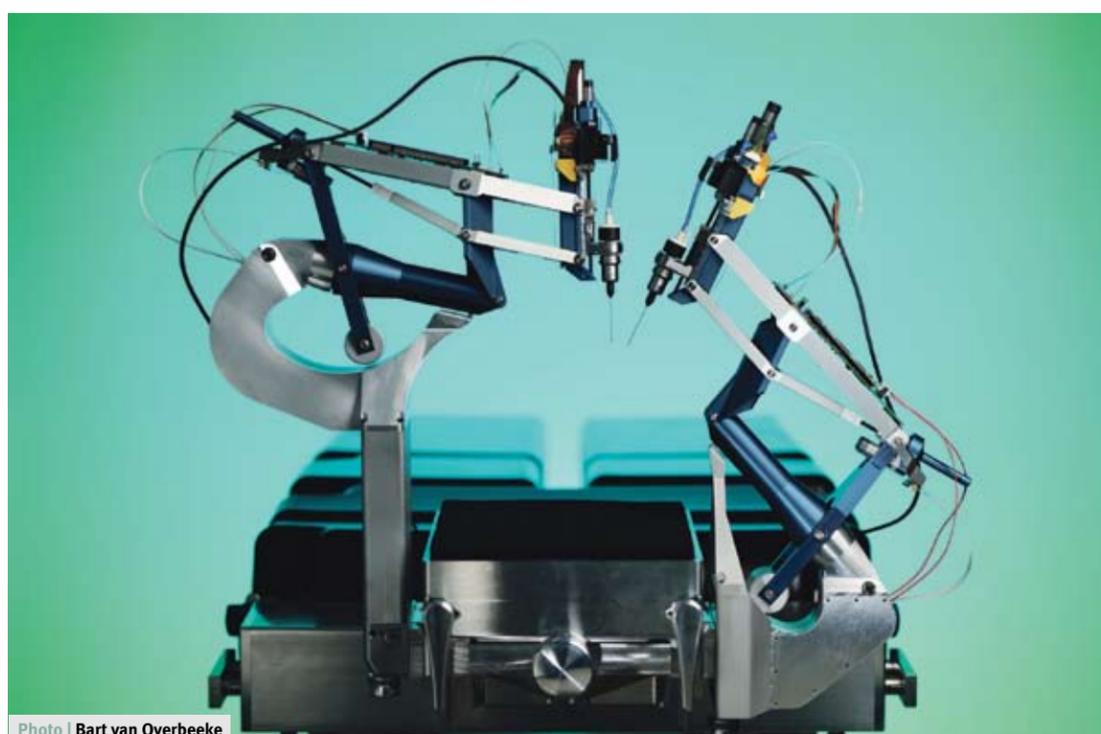
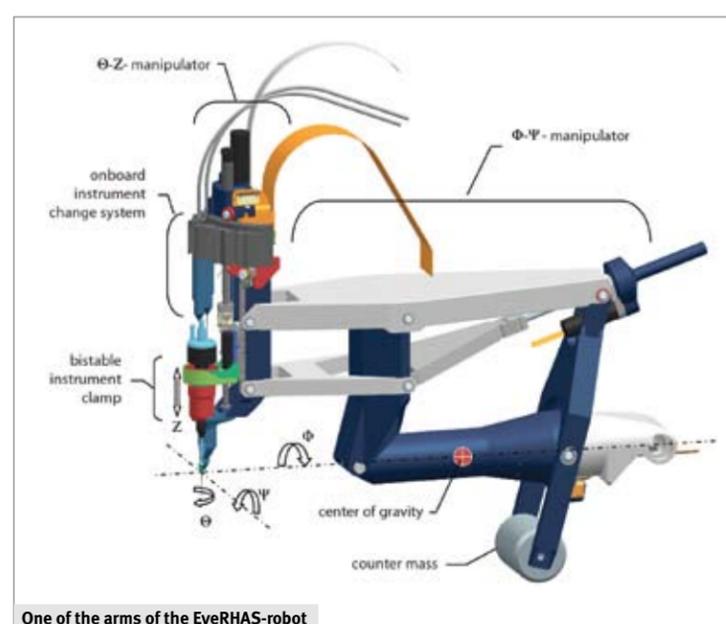


Photo | Bart van Overbeeke

retracted manually." The patient is comfortably lying on a headrest, and the eye that's operated is anaesthetized: the patient can neither move nor feel their eye. "There's still the risk of a panicky patient suddenly jerking their head to the side. To prevent that from happening, radiotherapy uses masks to secure the patient. These masks are not yet being used in eye surgery, and the question is whether they should be.

The surgeon can automatically switch instruments in a matter of seconds

Anyway, there will be a kind of emergency button that makes the robot arm retract in a matter of seconds in case of a calamity." Compared to the competition - there are several other research groups working on an eye surgery robot - Meenink is focused mostly on the implementation of the robot in a hospital setting. "I haven't designed the robot for lab purposes, but for the operating room. All its components are so light an assistant can set up the robot, and so small the surgeon can still be at arm's length of the patient. There's ample



One of the arms of the EyeRHAS-robot

room between the two arms of the robot to use a microscope to capture the operation." The PhD candidate also built a system that enables the surgeon to automatically switch instruments in a matter of seconds. Switching to the operation robot wouldn't require major changes in hospitals: it can be used in standard operating rooms, and the robot uses existing surgical instruments that are adjusted only slightly. Still, we're not there yet. After his graduation, Meenink will remain with

the Control Systems Technology group of his promoter prof.dr.ir. Maarten Steinbuch and co-promoter dr.ir. Nick Rosielle at least until February. "I'll be testing the robot on eggs and dummies and try whether it can lift and move objects. In the meantime, we'll be looking for funds to market the robot. I'd be very disappointed should we not continue this project." (T)