

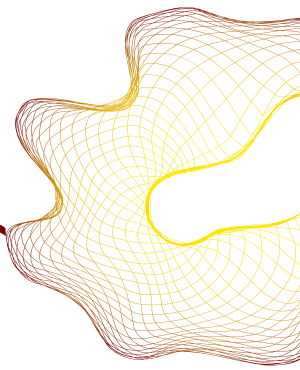
UNIVERSITY OF TWENTE.



PHD RESEARCH
large-scale,
safe energy storage

A WORLD PREMIERE
Dossier wind energy

ENTREPRENEURSHIP
25 years of Demcon



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HIGH TECH, HUMAN TALENT

'High tech, human talent', the theme for the celebrations for the 57-year anniversary of Twente University at the end of November. Our campus boasts a high concentration of talent which attracts more talent, like a magnet. The number of young people applying for our bachelor programmes has never been higher. We have gained great appraisals and reviews for our courses and have climbed to second place on the list of Dutch universities in the Guide. The above is making me feel optimistic, for several reasons. The high praise for our education indicates we are on the right track. But let's widen the scope, to include our society as a whole. Society demands a lot from us: there are plenty of pressing issues demanding a solution. An entire generation of young people is about to embark on an educational programme. Our students will be working on soluti-

ons, they are tomorrow's leaders. It's up to us, as a university, to allow these young people to discover their talent and develop it. This is a big responsibility. It demands a lot from our people, who at the same time also have to show their own talents in their research, in valorisation. Talent and its impact can no longer be measured via prizes, publications and citations alone. Real talents are also characterised by the fact they do not keep this talent to themselves, but gather new talent and surround themselves with it. We need these magnets. When the TH Twente was founded 57 years ago, the mission was clear. The economy and employment opportunities in Twente needed a boost. And even now, it is something we should work hard at, together with our partners in the region. Twente as a whole is meant to be a strong talent magnet! ●

"IT'S UP TO US, AS A UNIVERSITY, TO ALLOW THESE YOUNG PEOPLE TO DISCOVER THEIR TALENT AND DEVELOP IT"



SINCE 25 NOVEMBER 2016,
THOM PALSTRA HAS BEEN
RECTOR MAGNIFICUS OF THE
UNIVERSITY OF TWENTE.

'COOL' WIND TURBINE IS LIGHT AND COMPACT

A world premiere, late summer in Denmark. The 'normal' magnets on one of the large wind turbine along the coast have been replaced with superconductors. The result: the same capacity from a smaller and lighter generator. UT researchers were involved in the design and testing of the superconductors. BY Wiebe van der Veen PHOTOGRAPHY Great Communication (DK)

SUSTAINABLE:



The turbine has been operational for a few months, gradually moving towards full capacity. The researchers in Twente are constantly receiving performance updates. The superconducting coils and the cooling system are doing great. "That's exciting, because this is a very ambitious project", says UT professor Marcel ter Brake. He leads the Energy, Materials and Systems (EMS) group at the UT. "As one of the few groups in the world, we have the expertise on compact superconducting coils as well as the associated cooling techniques." The wind turbine by project partner Envision, 88 metres high and with a rotor diameter of 128 metres, supplies 3.6 megawatts at full capacity: electricity for approximately 4000 households.

"A superconducting material is able to conduct an electric current without any losses. This means high volumes of electricity can flow

through it and generate powerful magnetic fields. MRI scanners in hospitals work with superconductors, for instance. Depending on the material, they do require significant cooling in order to become superconducting. This cooling goes as low as minus 240 degrees in the wind turbine; a lot colder than the temperature needed for the material to become superconducting, but it ensures a margin.

The superconductors replace permanent magnets. Just as in a bicycle dynamo, the magnet rotates in a series of coils that convert the magnetic field into electrical energy. As well as being heavier and larger, the conventional magnets have another disadvantage: they are made from rare earths, particularly neodymium. Mining this material is complex and harmful to the environment, which will become a problem given the expected growth in the number of wind farms, and the

increase of ever larger turbines. Although superconductors also contain a rare earth metal, such as yttrium, the quantities are far smaller.

EcoSwing

A layer - a few micrometres thick - of the superconducting material is applied to a steel carrier. The resulting tape is used to wind around the coils. "These developments

"At full capacity, the wind turbine generates electricity for 4000 households"

progressed quickly", says Marc Dhallé, senior lecturer. "Not long ago, we carried out experiments in the lab with little pieces of tape, now it's being produced in kilometre-long batches." Dhallé is the project leader of the UT share in the European project EcoSwing, with wind turbine manufacturer Envision Energy and

WIND

UT researchers of the superconductors.

LARGE, LARGER, LARGEST

The Danish wind turbine with superconducting generator isn't exactly small, but General Electric (GE) is currently developing a turbine that stands 260 metres tall; the Haliade-X, with three rotor blades that are 107 metres long each. Vincent Schellings, who studied mechanical engineering at the TU, leads the 300-strong design team for this giant intended to supply 12 megawatts. GE is investing about 400 million dollars in the turbine over the coming years. The prototype will be built in Saint-Nazaire, Bretagne, and serial production is anticipated from 2021. Schelling succeeded in pushing his team to go to extremes, especially with the length of the rotor blades. "If your hands are not sweating, you haven't set the bar high enough", is his response to the Financieel Dagblad. Existing production processes are not longer sufficient: the enormous rotor blades alone required the development of a special new robot.





OR SMALLER

Another trend is actually smaller wind turbines. A few Twente University and Saxion alumni established EAZ, producing turbines for farms. They are made of beautiful materials and their 15-metre green towers blend in with the landscape. The turbines supply 15 kilowatts, for example to a single farm. The north of Netherlands sees a lot of this type, the EAZ Twelve: sometimes up to three next to one farm. This is a great example of a wind turbine for small-scale and decentralised generation.



DRONE INSPECTION

Wind turbines should operate without malfunctions. Maintenance, certainly at sea, should be kept to a minimum. Work on these turbines is certainly not without risk. Robot experts, some from the UT, working on the European AEROWORKS project develop drones that can carry out inspections and maintenance - even autonomously. A drone with robotic arms is a challenge in itself: how is the flight performance affected by the work the drone is carrying out? In addition, it is also possible – for example – to continuously monitor the turbine construction using wireless sensors: this is already in place for bridges and metro stations.

various other participating businesses. These include THEVA in Germany, producer of the superconducting tape.

The ultimate advantage is that a lighter and smaller generator, producing the same capacity as with a permanent magnet, is possible thanks to the superconducting coils. This results in savings on the entire wind turbine's support structure. "Road transport is also less cumbersome. The 4-metre outside diameter is considerably smaller than usual", says Dhallé. Four metres was too wide to accommodate the rotor in a UT lab. The most recent adaptations and tests were carried out at the Boessenkool machine factory in Almelo. From the Fraunhofer Institute for Wind Energy Systems in Bremerhaven, where a last round of ground

testing was carried out, the rotor travelled by ship to Thyborøn in Denmark, where the traditional generator of one of the wind turbines was replaced by a superconducting one at the end of August

Motivated

The UT researchers carried out tests in various locations. Dhallé: "All partners in this project are very motivated. As we are responsible for 'all that is cold', we carried out tests at several partner locations. For instance, we worked in teams at Fraunhofer and at Jeumont Electric in France." One of the researchers is PhD student Anne Bergen, who also had the opportunity to observe the work at great height - at the top of the wind turbine - in August. "It was great moment", she says. "You realise how small you are up there. On the other hand: years of work



PhD student Anne Bergen: "Great to see your work at such great heights".



on compact coils in the lab being applied on such a scale, I hadn't realised that was possible at the start." Bergen conducts research into the reliability of superconductors: if a small defect results in the material no longer being superconducting in one spot, you want to avoid the entire coil warming up or even malfunctioning.

Cooling

Does this not mean a complex wind turbine, and to make matters worse, one that requires energy for cooling? Dhallé: "Of course, cooling costs energy, but it is a fraction of the capacity supplied by the wind turbine. Maintenance, certainly at sea, should remain minimal. The cold part containing the electromagnetic component is detached from the other moving parts - such as the bearings - by way of a vacuum. We

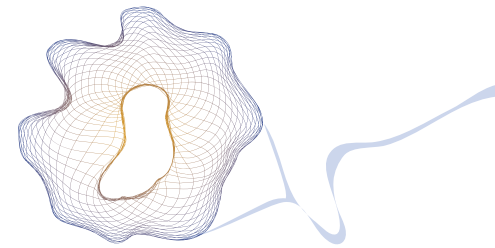
cool down using small dual 'pots' of helium that follow the rotation." After thorough laboratory testing, the wind turbine is now ready to prove its worth for real in the strongly varying conditions along the North Sea coast.

The Ter Brake group is very experienced in testing superconductors under extreme circumstances. Superconducting cables that endure powerful forces are required in the ITER nuclear fusion reactor under construction in Cadarache. The measurements carried out in Twente on cables from various manufacturers are used as the definitive reference. Another example of how UT'ers are contributing to a future clean energy source. For example, superconducting cable could also be a solution in the thick electricity cables to and from wind farms.

OPTIMUM POSITIONING

Each wind turbine affects the other in a wind farm at sea: 'drag' formation occurs, a turbulent wake behind the turbine's rotor blades that influences the functioning of the next turbines in the farm. Richard Stevens, researcher in the Physics of Fluids group, studies these drag effects. Although complex computer simulations are involved, Stevens is aiming to arrive at a clear set of recommendations for optimum positioning of wind turbines. He received a so-called Vidi grant for this study from the Dutch Organisation for Scientific Research (NWO).

IN BRIEF



NEW DEAN AT TNW FACULTY

Jennifer Herek has been appointed by the Executive Board as the dean of the Faculty of Science and Technology at Twente University. From 1 January 2019, she will succeed Hans Wilgenkamp, who held the position since February 2014. The appointment is for a period of four years.

Herek is currently dean at the University College Twente (UCT). Herek was the founder and figurehead of the ATLAS programme. She is also dean of the honours programmes at the UT and professor in the Optical Sciences Group at the Faculty of Science and Technology.



DIGITAL INEQUALITY

Alexander van Deursen, researcher at Twente University, presented the report 'Digital inequality in the Netherlands in 2018'. Commissioned by Mediawijzer.net, he investigated how people from different population groups use the Internet and which

positive and negative effects they experience. The elderly, low-skilled and those with a lower income have a less positive attitude and motivation, inferior devices to access the Internet, a lower skill level and a more limited use

STARTING SIGNAL GEOTHERMAL ENERGY

KenGen, Kenya's largest energy producer, and Twente University sounded the starting signal on Thursday 1 November for a three-year geothermal energy collaboration. In the period until 2022, the parties will work together on various activities and knowledge projects aimed at more sustainability for the extraction of energy from geothermal heat. The programme's focus is on the development and exchange of knowledge, but several specific research projects will also be carried out at the locations where KenGen extracts energy from the earth. For instance, the parties will jointly develop a UAV (drone) platform that can be used for monitoring with the use of camera images and infrared at the various KenGen locations. There are also plans for the implementation of a monitoring system that will allow KenGen utilise the (geo) data already present more effectively for planning and monitoring its activities.



of the Internet. In addition, they also have the least access to good quality help. As all these phases are decisive for achieving positive effects or protection against potential dangers, people who are already in a vulnerable position are further marginalised.

UT DOUBLES TOP COURSES

Twente University once again experiences a rise in the latest edition of the University Guide. This places the UT in second place on the university rankings, with an upward trend for the fifth year in a row. Compared to the 4TU universities, the UT occupies the second place (67.5 points). Wageningen is in first place with 74 points. Eindhoven is

placed third with 60.5 points and Delft scores 58 points. Engineering Physics is the best course in the Netherlands for the fourth time in a row, with 92 points. Eight courses are labelled Top Programme. This is twice as many as last year.

The Top Programme designation is awarded to courses that score 75 points or more: At UT, these are Engineering Physics (92 points), Chemical Science and Engineering (84), Communication Science (82), Industrial Engineering and Management (80), ATLAS (80), Creative Technology (78), Applied Mathematics (76) and Technical Computer Science (76).



30 MILLION EUROS REGIONAL DEAL

Regio Twente and Twente Board are delighted with the cabinet's decision to allocate 30 million euros to a Regional Deal with Twente. Twente will receive the money to tackle various assignments: expansion of the Twente top work locations, smart manufacturing 4.0, a future-oriented labour market and the transition towards a circular economy.

Eleven projects have been listed within the programme of this regional deal that Twente will work on in collaboration with the government.



More information about these items can be found at: www.utwente.nl/en



KING OF THE ASPHALT

Electric Superbike Twente grabbed a win during the first season of the MotoE competition. Team manager Tim Veldhuis is proud of the entire team. "It is unbelievable. We are showing the world that it is possible to design, build and race an electric race monster within twelve months. The win is the cherry on top of our hard work."

At the end of September, Solar Team Twente achieved not one, but

two podium positions during the iLumen European Solar Challenge (iESC), the unofficial European championships for solar cars. The solar team from Twente entered two solar cars this year. RED Shift and RED One. After 24 hours of racing in rainy conditions at Circuit Zolder (Belgium), the team with two solar cars made it to the podium: RED One in second place and RED Shift in first place as the European Champion.

ENERGY DENSITY SIMILAR TO LEAD-ACID BATTERY

DOCTORAL RESEARCH INTO LARGE-SCALE, SAFE ENERGY STORAGE

Now homes have to be weaned off gas, there is a growing need for local storage of energy from sun or wind. Using a modest laboratory setup, chemical engineer Martijn Blom studies large-scale, safe energy storage with the use of electrochemistry. BY Hans van Eerden PHOTOGRAPHY Rikkert Harink

There are many solutions for large-scale storage of sustainably generated energy. PhD candidate Martijn Blom explored the options. It took him less than six months to write a research proposal with the help of a scholarship from the

“The capacity does not have to be substantial, but it would be nice if it lit up a small bulb”

Twente Graduate School. “In hills or mountains, it is possible to establish an elevated and low-lying water reservoir. Any residual energy, for example from wind or sun, can be used to pump the water upwards. In case of energy demand, the water can flow downwards through a

generator.” Another option is to use electricity to split water into oxygen and hydrogen. “This can be stored and used elsewhere at a later time, such as in a fuel cell. This generates electricity again from hydrogen plus oxygen; clean, as the emission is water.”

However, the Netherlands has hardly any height difference and hydrogen requires safety measures for high-pressure storage. For this reason, Blom is aiming for an electrochemical process that guarantees the promise of safety and simple upscaling. He carried out exploratory research into the above for his graduation. He started as a doctorate candidate at the Sustainable Process Technology unit at the start of the year. The research group

rose to prominence in the field of biofuels but had no previous experience with electrochemistry. For this reason, Blom works closely with the colleague unit Photo-catalysis Synthesis, experts on electrochemistry. “It’s an emerging discipline in the sustainable energy sector and we’re looking at it from a process-related angle. What are realistic conditions for application and which issues can we expect in upscaling?”

Appealing process

Blom explains the process of electrochemistry: “An electrochemical reactor converts potassium bicarbonate into potassium formate. The formate has a higher energy than the bicarbonate. Electrical energy is added to start the reaction



(‘up the hill’). The catalyst helps with this. In reverse, from formate to bicarbonate, the reaction results in electricity, like the analogy of the elevated and low-lying water levels. Both substances are stored in reservoirs, stable in an aqueous solution. This makes the process safe; the substances are not poisonous, flammable or otherwise hazardous.”

This sounds appealing and simple, but there are challenges along the way for Blom. “There is a side reaction for instance, whereby hydrogen is released. An explosive gas, you don’t want that, because the system has to remain very safe. The catalyst can be used to control the process. By varying process conditions such as pressure, temperature and acidity, I am investiga-

ting how the formation of hydrogen can be suppressed. I am also looking into the stability of the electrodes in the reactor. If the quality of these reactors diminishes, the energy efficiency of the process is also reduced.”

Seasonal storage

Martijn Blom is currently working on a small laboratory setup: reactor and storage are the size of a jerry-can. He hopes his doctoral research demonstrates the process works and generates electricity. “The capacity does not have to be substantial, but it would be nice if it lit up a small bulb.” His possible successor, or Blom himself in a spin-off, can then further improve and scale up the process. He has already considered the feasibility.

DOUBLE PRIZE

During the opening of the UT’s academic year at the beginning of September, Martijn Blom received the Faculty of Science and Technology (TNW) graduate award. For his graduate thesis on ‘electrochemical energy storage’, he was scored 9/10 (Reporting & General) and 10/10 (Scientific & Research). The jury was also impressed by his previous study results, the many discussions with teachers, and his extracurricular activities (including co-organising a study tour to Indonesia). At the same event, he received the Twente Graduate School Award for his research proposal for cost-effective and safe storage of sustainably generated energy.

“My calculations show that the energy density could be similar to that of a lead-acid battery. Storage of around one-and-a-half cubic metres could hold ten percent of an average household’s annual energy demand. Not inconsiderable, but manageable. This is how seasonal storage could be achieved safely in a residential area: only store energy for a couple of months during the summer and take the energy out again later.”



"It has been rare since to find ourselves on the same page like that"

An expression of the action 'Twente makes the demand!' Twente University Library Historical archives.

TWENTE PERSUASION

Directors and industrialists from Twente took part in intensive lobbying during the sixties for establishing a technical university of applied sciences in the region. The predecessor of the Twente University Fund played a crucial role here. The fund celebrates its seventieth birthday this year. A great reason to shine a light on the foundation of the fund once again. BY Jorrit J. de Boer PHOTOGRAPHY Twente University Library Historical archives

The post-war period had been beneficial to industry in Twente. The pre-war level of industriousness was reached quickly during these years of recovery. However, the machinery and equipment were outdated and there was a shortage of workers. Also, in order to withstand the increasing competition from low-wage countries - particularly in the labour-intensive textile industry - innovation was necessary and required research and engineers.

The Stichting Technisch Hoger Onderwijs voor Noord- en Oost Nederland (Foundation for Higher Education for North and East Netherlands) was founded on 17 December 1948. The objective was to establish a technical university of applied sciences in Twente. The lobby for technical higher education by the foundation and others was an elevated matter. The foundation could count on government-level representation from the four north-eastern provinces and directors and managers from large companies. Still, the first battle was lost. The second Technical University of Applied Sciences in the Netherlands was established in Eindhoven in 1956. The fact remained that Delft and Eindhoven together still didn't supply enough engineers to the labour market.

The foundation succeeded in significantly galvanising the industrial character of the countries eastern regions. There was talk of an 'industrial belt' that ran from the Achterhoek in Gelderland, via Twente and southeast Drenthe to the old peat areas in Groningen. It was Twente in particular that stuck out. 'In Twente, a widespread industrial production system has formed, that places very high demands on the education of the workers.' To emphasise that industry in Twente was not solely about textiles, spotlights were aimed particularly at the large metal and electrotechnical companies and the salt industry (Akzo). These companies also had laboratories that could be used in collaboration with the uni-

versity of applied sciences. The foundation's message was picked up and by the national papers, who ran with it. An important success.

However, it was not cut and dried that Twente would be the actual location. In June 1959, a provincial committee had expressed a favourable opinion on a university of applied sciences in Zwolle. As response, the Twente business community pledged more than one-and-a-half million guilders for a Twente university of applied sciences just a few days later. Quite a substantial amount in those days. This powerplay was given plenty of attention in the national press.

The inhabitants of Twente also mobilised. A TH-Twente action committee was established, with local action committees in almost all 30 municipalities in Twente and the Achterhoek. As someone who was actively involved expressed later: "The actions were not always free from demagogy, but they did represent occasions where Twente spoke as from one mouth, whether it was in Almelo, Enschede, In Oldenzaal or Nijverdal. It has been rare since to find ourselves on the same page like that."

The harmony and consensus in Twente, the 'noise' made by the business community and the citizens' actions certainly created the desired effect. The Provincial Council had been persuaded: a new institute for higher education was needed for Twente. Still, the final decision was for the minister and the Lower House. A ministerial committee felt that a university should be established to the east of Deventer. A university there was to have a wider reach than in the border region of Twente. This was a blow to Twente. 'What is wanted is not a new institute in the east of the country, but a new institute is wanted in the east of the west of our country.'

Nonetheless, minister Cals disregarded the committee's recommendations and came to a different

consideration on 25 January 1961. According to him, the student numbers were not a deciding factor. What counted in favour of Enschede was the possibility of contacts with industrial businesses and their laboratories. In his opinion and vision, the deciding factor was the enthusiasm within the region. "The power of persuasion emanating from Twente when advocating the establishment of a technical university of applied sciences at Drienerlo, as well as the willingness for sacrifice shown by industrial and other businesses makes the undersigned expect that, in relation to the establishment of a technical university of applied sciences in Twente, powerful support can be expected from the authorities and the population!"

This history demonstrates that the establishment of a technical university of applied sciences in Twente is the result of the industrial potential of the region, as well as the unanimous and powerful lobbying by industrialists, directors and the inhabitants. Something that should serve as a shining example even today.




Announcement for the public meeting of the TH Twente Action Committee.

If you wish to receive the full article by Jorrit J. de Boer, please send an e-mail to: universiteitsfonds@utwente.nl.



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TEAM BASED LEARNING FOR



"I want students to have a discussion, have a dialogue about how to arrive at an outcome"

When Brigit Geveling reminisces about the day in September when she received the BIG award for educational innovation, she starts beaming again immediately. "It gave me such a boost, it was fantastic. In February I will start using my method with seventy civil engineering students, but it would be cool if more courses followed." BY **Frederike Krommendijk** PHOTOGRAPHY **Rikkert Harink**

REAL UNDERSTANDING

TEACHER BRIGIT GEVELING IS THE PROUD WINNER OF THE BIG AWARD

The BIG award was not a complete surprise. Brigit submitted the Team-Based Learning method last year too, making it to the last three. "For this year, I fine-tuned everything a little more and changed some things. I knew I was in with a chance. But when you get the news... I found out just after I had achieved my senior education qualification (SKO). These two amazing pieces of news, I was very moved."

Teaching is in Brigit's blood. She started teaching at the TU in 1984, and even now she puts her heart and soul into it when she talks about teaching mathematics. Still, she thought that current teaching methods could be improved. "Simply put, I want students to come up with the answers themselves. People sometimes say: mathematics, it's all about tricks. If you approach it like that, solving a problem is no more than a skill you can repeat over and over. But it does completely ignore the underlying comprehension you need to solve it."

Independent thinking

With her new method, Team-Based Learning, Brigit encourages independent thinking to arrive at solutions. The problems are presented to students, who then work together in teams. "I want them to have a discussion, have a dialogue about how to arrive at an outcome. Why would you tackle it like this? They have to write down the exact route to the solution, as it is almost more important than the solution itself. To prevent a student from avoiding

the work, all students are also tested individually. "If you don't prepare anything, the team will not accept you. And you would get found out from your individual work anyway", she says, sternly.

Students now often look in the answer booklet or wait for the teacher's answers and then follow the steps described. "A student once came to me and said: I don't understand this step. I said: But what did you actually do yourself? You have to discover the path to a solution. I have noticed that by formulating clearly and writing down what you are doing and why you are doing it this way creates a lot more understanding of the subject matter. You won't succeed by just memorising formulas."

The passionate teacher says this method could be applied to many more subjects. "In America, this method was developed and used in the Pharmacy course. But I think that Team-Based Learning can be applied to many more subjects and courses. I was invited to speak about this method to teachers at a conference in Copenhagen and I noticed that they were inspired."

What about the students? Are they just as happy? Brigit laughs. "Of course, I have carried out tests. The students indicated that it really taught them to think and work differently. They like discussing together and say that they are less likely to forget the things they learned. That's hopeful. But to the question

whether they would tackle it the same way for other problems, they seemed to revert to the old way of learning. I have to think of something to change that."

She will start using the method properly in February. For four hours a week, she will teach about seventy civil engineering students using the new method for a quarter of an hour each time; another colleague will also do an hour. "It's exciting, because other students will start with the traditional method at the same time. We are not teaching any tutorials anymore, only this method. A lot of work goes into the preparation and creating good problems, but during tutorials you are more of a coach and advisor. The exams will show the differences in the results. Of course, I hope that my students score better, it would be really encouraging to expand this further within the UT and beyond."

"I love my job.
Helping students in
their development is still the
best thing in the world"

The conference in Copenhagen, interviews such as this one, Brigit is enjoying all of it. "I love my job. Helping students in their development is still the best thing in the world. And the fact I can inspire colleagues so that this teaching method might be applied in a broader sense really gives me lots of energy."

ACTIVE STUDENT

Your jaw will hit the floor if you hear what Sevim Aktas manages to cram into one day. She was the chairperson of the UT Model United Nations, is now a Stanford University Innovation Fellow, a member of the Dream Team and all this in addition to her Advanced Technology studies. "I am just really enjoying all of it." BY Frederike Krommendijk PHOTOGRAPHY Rikkert Harink

SEVIM AKTAS IS COMMITTED TO HONESTY AND SUSTAINABILITY

"IF YOU BELIEVE IN SOMETHING, GIVE IT YOUR ALL"

Much in Sevim Aktas's life is determined by chance. As a 6-year-old, she moved from the Netherlands to Germany. If her grandma hadn't noticed the great study programmes on offer at the UT, she would've never attended the open days and would never have come back to the Netherlands. And she also wouldn't have met the Green Team when herself working at one of the subsequent open days, where she fell so deeply in love with the technology of the hydrogen car that she immediately wanted to join the team.

"Maybe it is true that you are subconsciously guided towards people that contribute to your development. I was quite shy and didn't know myself yet, but here at the UT I discovered my values, what I stand for, my strengths and also my weaknesses. All the things I do sometimes cause me unease and stress, but that's part of growing."

She established the UT Model UN with two other students, is a member of the University Council ('The critical friends of the Board'), is a member of the Dream Team that runs DesignLab, and she is a University Innovation Fellow (UIF), a programme by the University of Stanford. She also learned to say no, thanks to a special quality for a 21-year-old: she knows exactly which values are important in her life. For me, this is honesty first of

all, that's what my parents have given me and as soon as I see injustice, I react very passionately. The other value I discovered at UT is sustainability. The things I do suit these values very well and if you approach something with passion and conviction, it doesn't cost you any energy, it will give you energy."

She played an important role in the opening of the academic year. "I was so terribly nervous. But it was great." She also tries to inspire other students to move outside their comfort zone and chase their dreams. "What could happen? The worst would be to stop. When I give people that little push and they later have this fire in their eyes when tell me how it went, that is amazing."

The outside world is also getting to know her passion. She is a guest on De Rode Loper, in January in Almelo, whether she tries to convince entrepreneurs to take steps now to create a more sustainable world. "Many people think they have to change the world and this immense task completely floors them. I try to inspire them to inspire one other person in their circle. There really is no need to be the new Steve Jobs. If you believe in something, just give it your all. I can name about fifty people at the UT immediately that passionately contribute to a better world. That's where it starts. I am proud I can surround myself with that.



"If you approach something with passion, it doesn't cost any energy, it will give you energy"

TWENTE UNIVERSITY IN SOCIETY 5.0

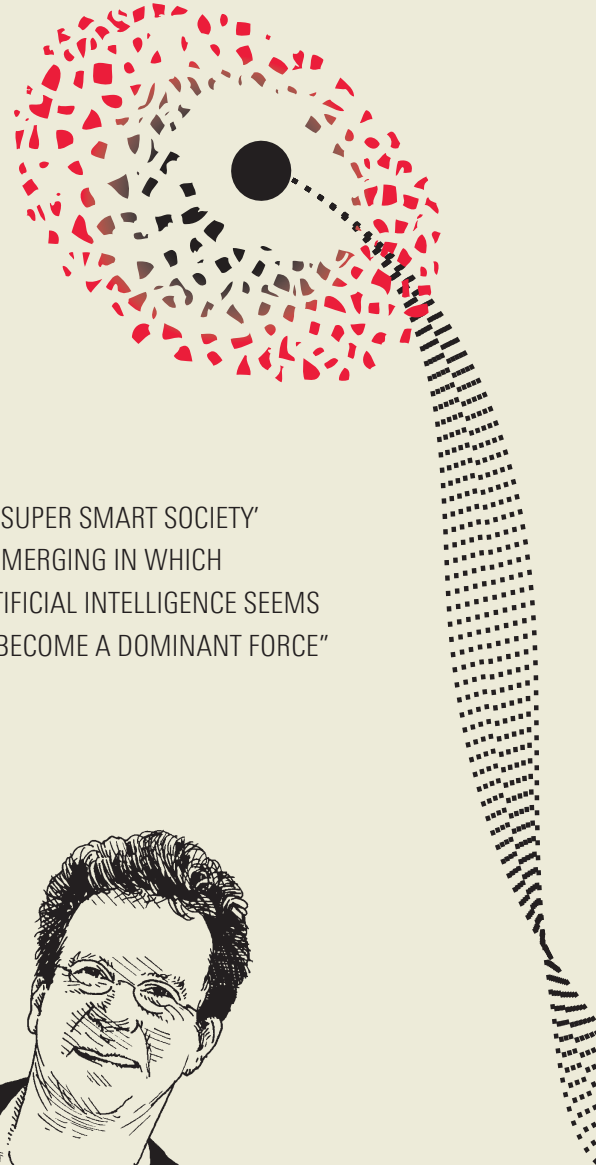
Technological developments are rapidly changing our society. The current wave of digitalisation is also indicated as the 'fourth industrial revolution'. After mechanisation of labour, mass production and automation, a phase of digitalisation has now arrived, in which artificial intelligence, robotics, and the Internet of Things play a central role. The boundaries between humans and technology are fading: instead of 'using' technology, people are increasingly interwoven with it. 'Smart environments' fuse technology with the environment, intelligent implants fuse with our bodies, telepresence technology gives people a second body and the arrival of robots and algorithms has given technology a certain autonomy.

All these developments have shifted our society into a new phase too. Some people are even referring to this as 'Society 5.0'. After the age of hunter/gatherers, the agricultural society, the industrial society and the digital society, the emergence of a 'super smart society' is now upon us, in which artificial intelligence is seemingly becoming a dominant force. What this society will look like is hard to predict. But the fact that a lot could change becomes clear as we look back at previous technologies that have had an impact on the cognitive functioning of human beings, such as writing and book printing. Script (writing) has changed how our memory functions. Book printing caused a democratisation of knowledge and enabled the scientific revolution. What effect will artificial

intelligence have on our cognitive functioning? What expertise do we expect from physicians if algorithms could possibly be more reliable for determining a diagnosis? What do we expect from a judge, if a computer system prepares a verdict on the basis of algorithms we can hardly oversee anymore?

It is no surprise that a societal debate on artificial intelligence has erupted. Ethics are wading in, influential techies like Elon Musk and Bill Gates are warning the world and bestselling authors like Harari paint terrifying future scenarios. A few years back, ethics mainly focused on 'human enhancement': are we perhaps moving towards the 'super human', bringing new inequality, injustice and indignity? By now, the discussion is actually about 'human replacement': are we not rendering ourselves vulnerable to being overpowered by our own technology? From the fear of 'too human', we have now shifted towards a fear of 'not human enough'.

Amid this 'super smart society' the university will have to reinvent itself. What should students learn if knowledge is not just in people but also in machines? Will one course still suffice directly after secondary school, or will we move from 'education' to a permanent 'reduction'? How do we reshape the expertise of physicians, teachers, judges, managers? How do we integrate and implement all these new technologies responsibly? These are dizzying questions. But they do imply a rich future for a university in terms of High tech, Human Touch. ●



“A ‘SUPER SMART SOCIETY’
IS EMERGING IN WHICH
ARTIFICIAL INTELLIGENCE SEEMS
TO BECOME A DOMINANT FORCE”

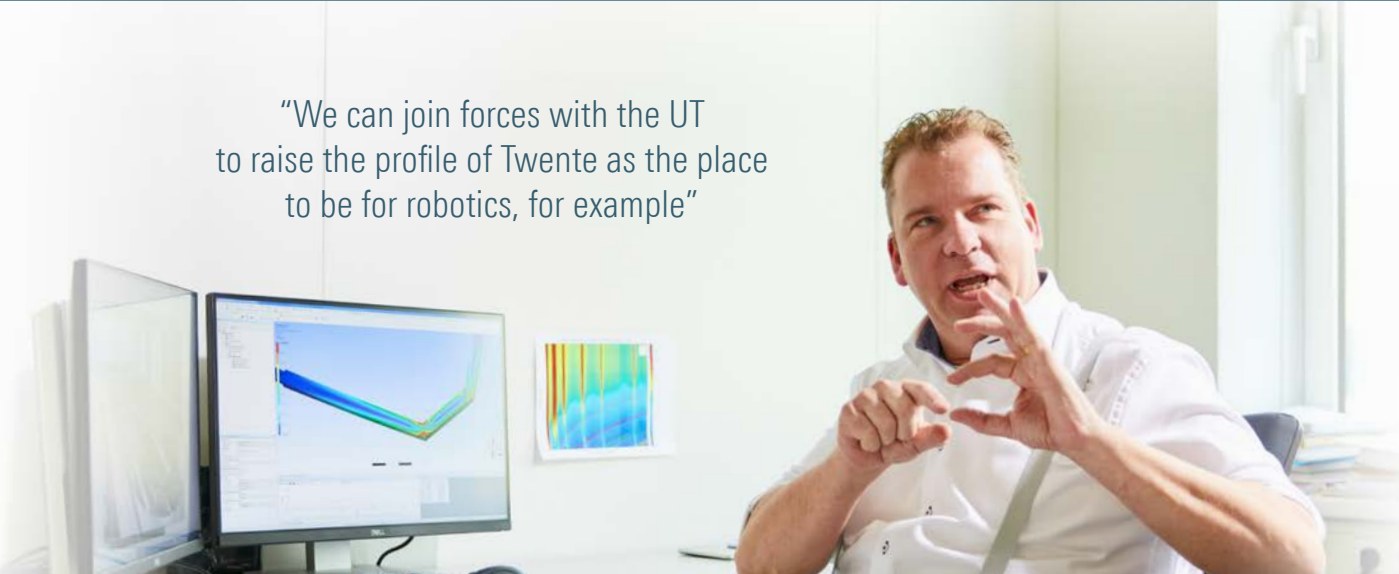


**PROF. DR. ENGR. P.P.C.C. (PETER-PAUL)
VERBEEK** (1970) IS PROFESSOR OF PHILOSOPHY
OF MAN AND TECHNOLOGY AND UNIVERSITY
PROFESSOR AT THE UNIVERSITY OF TWENTE.

With 600 employees and branches in all corners of the country, 25-year-old Demcon might be the UT's largest hardware spin-off. Founders and UT alumni Dennis Schipper and Peter Rutgers are still having a great time. BY Hans van Eerden PHOTOGRAPHY Demcon

25 YEARS OF DEMCON

"We can join forces with the UT to raise the profile of Twente as the place to be for robotics, for example"



THE PERFECT PARTNER FOR THE UT TO MARKET KNOWLEDGE

Demcon designs and produces high-tech systems and products. The company is growing at a steady pace and has evolved from a mechatronic design agency into an all-round technology developer and producer over the last 25 years. Demcon developments include numerous medical devices, such as for measuring blood pressure, for ventilation, and for monitoring rheumatic inflammation. For this, the spin-off founded professional in-house production. From a technology aspect, the company currently has five focus areas: high-tech systems, medical systems, industrial systems & vision, optomechatronic systems and unmanned systems.

There is a close relationship with UT, in the form of joint research projects and the 'supply' of graduates. Dennis Schipper: "We are the UT's perfect partner for marketing its knowledge. We are closely aligned with the educational institute, we find talent and knowledge and we help the university to organise public-private collaboration for research, with co-funding from us in kind and in cash.

Schipper is pleased about how the UT develops itself and the choices it makes. "For example, we are happy about the importance the UT attaches to medical technology and technical medicine. I regard the educational growth as very

positive, for example the new collaboration with the VU Amsterdam for mechanical engineering. The number of graduates produced by the UT can never be enough for a company like ours, but I can see that the UT is stretching itself with its capacity to accommodate the growing influx of technical students."

In 2013, the company moved from Oldenzaal to Enschede. The Kennispark, where both the UT and Demcon are located now, represents a shared significance. It's where Demcon is developing plans for its own campus. Next year, the opening of the Demcon Technology Center signifies the second 'building block' of this

ROOTS IN TWENTE

Demcon is a spin-off from the Mobile Autonomous Robot Twente (MART) project by the UT. Dennis Schipper was carrying out his doctoral research on MART, Peter Rutgers was one of the many graduates. There is an immediate connection and in 1993 they establish the mechatronic design agency Demcon. Mechatronics are still new at the time, in the form of collaboration between disciplines such as mechanical engineering, electrical engineering, information and physics required to design and build successful high-tech systems. The two UT'ers are immediately faced with challenging projects. Examples are AAP, a robot able to play

noughts and crosses intelligently, and medical products such as a sit-to-stand lift which is still available in 2018, and an IV warmer. After five years they manage to add ASML - current market leader in lithography machines for the production of chips - to their client portfolio for the construction of complex qualification and test systems. ASML is still a large and important client to this day. Demcon opened an Eindhoven branch in 2011, followed by locations in Delft and Groningen in 2017. Internationally - 60 to 70 percent of the turnover is from abroad - there are branches in Münster, Germany, and Singapore is on the list for market exploration.



THE ENTREPRENEURS

Dennis Schipper (54, pictured on the right) studied mechanical engineering at the UT and carried out his doctoral research under professor Rien Koster. The basis for Demcon's future working methods was formed then: to understand the essence of the actual technical issue and use this to also take a closer look at the question itself. After founding Demcon, Schipper proved to be a veritable entrepreneur. The day-to-day management is his responsibility and he has initiated the Incubate programme within Demcon: support for new and growing companies.

Together with colleagues from high-tech companies in Twente, Schipper establishes Mechatronica Valley Twente with the aim of promoting the regional high-tech industry. In addition, he is a long-term member of the Innovatieplatform Twente and recently became a commissioner at FC Twente.

Peter Rutgers (51) also studied mechanical engineering in Twente. He met Dennis Schipper whilst working on his thesis. After this, he became part of the first group in the second-phase course for mechatronic designers. Rutgers felt that a doctoral study of four years was too long and too theory-based, but this new course did appeal to him: one year of modules on mechatronic disciplines such as electrical engineering, information and control technology outside the scope of his own mechanical engineering field, and a one-year practical and challenging assignment with a company, Philips in Peter's case. Rutgers' main task within Demcon is engineering and technology, usually related to the most difficult part of a new system.

In 2002, Schipper and Rutgers received the Van den Kroonenberg prize.

campus. "We want to create a pleasant climate for living and working, together with our partners. To do this, we need the UT, and the UT benefits too."

The Demcon co-founder recently became a board member of the University Fund. "The fund dates back to 1948, when the first industrials called for the arrival of a university of applied sciences in Twente. That's impressive to me and I want to contribute to this great tradition of getting things done together." Schipper has worries too. Particularly the fading profile of the UT as an enterprising university. "I still think that we should cherish this authentic profile.

It has brought all of us in Twente a lot and can take us much further. I understand a university cannot live off regional businesses alone, but this does represent a unique profile and a specific contribution to the resolution of societal issues, together with entrepreneurs.

However, I hardly ever see UT'ers at business community meetings, much lower numbers than in Delft and Eindhoven in any case. We can join forces with the UT to raise the profile of Twente as the place to be for robotics, for example." As far as Schipper is concerned, Demcon will increase its impact in future, together with partners such as the UT.

IN THE LAB

Name **Caroline Lievens**
Position **Head of GeoScience Laboratory and lecturer at the ITC faculty**
Education **PhD Chemistry, Centre of Environmental Sciences (CMK)**
Lab **The GeoScience Laboratory (GSL)**

SOURCE **U-Today**
PHOTOGRAPHY **UT archives**

Did you know that the ITC faculty has its own lab? The GeoScience Laboratory (GSL) is located on the ground floor of the faculty building. It has twelve rooms with a combination of spectroscopy, geophysics, and (geo) chemical facilities. The photo only shows a glimpse of the laboratory for sample preparation, where you can find a muffle furnace, a polishing machine, and equipment for sieving and grinding.

The GLS is ran by ICT researcher Caroline Lievens. "It is open to everyone, but users have to complete training first. As soon as they have received adequate instruction, they can reserve a time for the use of their chosen equipment." The laboratory offers a wide range of instruments for users to carry out spectroscopic and/or analytical measurements on sample material. The chemistry laboratory is used for matters such as analysing soil types, minerals, biomass, oils and (contaminated) water. The geophysical laboratory contains equipment for studying the underground structure of the earth; and the spectroscopy laboratory can be used to examine the chemistry and physics of rare earths, there is also a field lab and a drone room. The latter is filled with - not surprisingly - various drones that researchers can use to determine the efficiency of crop production or for damage assessment after high-risk incidents, to name but a few uses.



“The laboratory is open to everyone, but users have to complete training first”



“I wanted to do things,
change things,
make the difference”



BENNO ODERKERK

CEO Avantes

- 1962 born in Utrecht
- 1981 studies electrical engineering at Twente University
- 1989 becomes technical director of Sensor Technology Munich
- 1994 establishes Top Sensor Systems
- 2000 relaunches as Avantes
- 2017 president of European Photonics Industry Consortium (EPIC)
- 2018 becomes chairman of PhotonicsNL
- 2018 sells Avantes shares, remains as CEO
- 2019 co-founder of Twente Visionaries Fund

UT alumnus Benno Oderkerk dreams of a future where smart measuring equipment monitors our health 24/7 and can predict a heart attack. Avantes, where he is CEO, makes an important contribution to this dream. "I expect it to be reality within 10 years." BY Marco Krijnsen PHOTOGRAPHY Fokke Eenhoorn

SPECTROMETERS WILL BE AS FAMILIAR AS GPS

Avantes has already developed 40,000 spectrometers for industrial use: applications in the chip industry - including ASML - but also in agriculture and the food industry, and for measuring solar cells and led lighting, for example. Spectrometers are used in Life Science for non-invasive surgery and measuring tumours, among other uses. Oderkerk's passion is mainly in healthcare. This preference has been apparent since early childhood. "My mother was a hospital patient several times. Every time I visited her, I was astonished by the tubes and equipment surrounding her bed."

Grandma's colour TV

The fascination for medical technology determined his choice of study and university. His mind was made up immediately at the Twente University open day when he watched a demonstration on electrostimulation in mice. Applied technology, that's what he wanted to study; the result was electrical engineering in Enschede.

However, the start was quite arduous. Oderkerk struggled with theoretical physics and mathemat-

ics subjects all through the first year. He even considered giving up. It was grandma's colour television that saved the day eventually. The student had taken the broken device with him to his room in Enschede. An electrical engineering lecturer helped him get the device up and running again for 2.50 guilders, the price of a new capacitor. The TV worked just fine all through his university days. "It was an eye-opener for me, a motivation to keep going until the course became more applied."

After his graduation, Oderkerk left for Munich to obtain a doctoral degree. He soon realised he was too impatient for science. "I am not from an entrepreneurial family, but I have an enterprising character. I find it hard to sit still. I was having trouble with the unenterprising nature of scientists. Spending half the morning drinking coffee and talking about all manner of things was not for me. I wanted to do things, change things, make the difference."

In Munich, he made the move to STM, a company that develops sensor technology for pacemakers. When he had the opportunity to



Benno Oderkerk, top row, second from the left.

become a co-owner, he returned to the Netherlands to establish a sensor technology business with his partner: Top Sensor Systems. The business location became Eerbeek near Apeldoorn, strategically situated along the north-south and east-west infrastructure.

Added value

Top Sensor Systems initially resembled both a business enterprise and an engineering firm. Business consultant Jan Melles, a doyen of photonics, recommended the development of own products to create added value. This is what we did. One of our first products was a variation on an existing spectrometer,



FUND FOR TWENTE START-UPS

Benno Oderkerk is co-initiator of the Twente Visionaries Fund (TVF) for start-ups in Twente. The fund, ready to start in 2019, provides support to new businesses. This is not just about money as far as Oderkerk is concerned, but also about advice for young entrepreneurs from Twente University.

"The support from the fund comes in relatively small amounts, between 50,000 to 100,000. It's a nudge in the right direction, no more, because I am convinced that as an entrepreneur, you should rely on subsidies as little as possible. This fund lets me give back to Twente. The UT taught me to be an independent thinker and I learned that everything can be resolved. That is what I want to convey to start-ups, in the role of business angel. I've come full circle."

reminisces Oderkerk. Thanks to the modification, physicians were able to measure the blood's oxygen saturation through the skin. "With a measuring instrument or sensor, the main factors are the measurement site and the monitor displaying the results. We added value with our measuring probes and software. Our clients were delighted."

Oderkerk and his partner wanted to progress. They detached themselves from Ocean Optics, the American supplier of the spectrometers. The company's name became Avantes. "We wanted the name to start with an A, because search results are often in alphabetical order. Top Sensor Systems were always at the back of the trade show calendar. The company gained a lot of technical knowledge through the acquisition of a small spectrometer

business in Amsterdam, which allowed for the development of a new, optical module of our own spectrometers. It ensured that in a short space of time, Avantes grew into a world player in its field. The company is particularly well-positioned in health-care. "Of all heart-lung machines in hospitals that measure a patient's blood count, eighty percent contain an Avantes spectrometer."

'Miniaturisation continues'

Photonics is another technology that also encapsulates spectroscopy. This is still in its infancy, says Oderkerk. Photonics are now included in the governmental agreement, and will gather pace. The comparison with gps comes to mind. This technology used to be exclusive to aircraft and can now be found in every smartphone. Oderkerk expects the same thing to happen to spectrometers. "They now

fit into measuring equipment allowing for medical examinations on location, such as an ambulance. The miniaturisation continues. Soon, they'll be fitted into your watch or ankle strap. The majority of the latest smartphone generation is already calibrated with Avantes spectrometers. These phones have an increasing number of health apps, our way of contributing to the dream I have. The dream also includes our personal space devices that keep an eye on our health. With smart toilets that monitor our urine, with smart fridges that check that the milk is still good to drink, with smart cities where traffic lights measure air quality and divert traffic based on the results. I think this will be reality in 10 years. Spectroscopy in combination with big data plays a crucial role in this development. After all, to measure is to know."

Professional Learning & Development (PLD) has been working with the Nedap company for some years. At the Nedap University beta-graduates follow a special programme for software developers. The UT provides four modules. Professional Learning & Development organises and coordinates the collaboration. TEXT & PHOTOGRAPHY PLD

OPEN DOOR FOR TALENT

Geert Hollander, director of Nedap Staffing Solutions, is happy with the PLD collaboration. "We are originally an organisation that offers hardware solutions, but we have been moving towards IT and software over the last few years. The opportunities we can see and the number of concepts we create are growing so fast that we cannot keep the employee numbers up: we have a chronic lack of software developers. We have thirty to forty open positions. Nedap University opens doors to new talent for us; people that can really make a difference in our business."

Selection

All beta-graduates can register for Nedap University, which is also the investor, says Hollander. "We are all about quality. There is a selection procedure. For each intake, there are about ten participants with different study backgrounds, varying from biomedical sciences to technical medicine. They are all super motivated."

Eager

Klaas Sikkel, Software & Design teacher at Business & IT for the UT, has also noticed this. "Participants take lessons together with regular bachelor students, but stand out because of their mature and active attitude. They sit at the front without fail and ask a lot of questions, they are very eager. This is great for a teacher, it keeps you alert."

Hands on

Although the educational programme that the Nedap University students follow is tailored, they still attend lessons from the regular bachelor programme, based on the Twente Educational Model (TOM). "We integrate several subjects into one module", says Sikkel. "The Software Systems module, for example, has the participants work on programming as well as creating design drawings for a programme. The participants also work on a practical project for Nedap, whereby they apply what they learned in a practical situation. Real hands-on education."



ABOUT PROFESSIONAL LEARNING & DEVELOPMENT

Twente University Professional Learning & Development develops and organises part-time master's degrees and executive education for highly educated professionals and managers. Scientific knowledge is applied in practical situations and combined with in-house issues and participants' experiences. Gaining new

knowledge and inspiration, exchanging experiences and expanding the network all form the basis of our courses and in-company progression for professionals and managers. Professional Learning & Development connects Twente University with organisations in the public and private sectors.

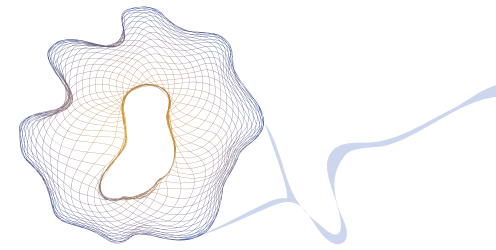
Client needs

Hollander indicates that the first intake has integrated successfully into the organisation. "Many now fulfil important roles within the company. The people are in positions that suit them, have learned to combine technical knowledge with analysing and listening to the client's needs. This is a special combination that we really focus on during the course."

A real-world connection

Sikkel is aware that it's not just Nedap that reaps the rewards of this type of innovative collaboration. "As a university, it offers you the opportunity to come down from your ivory tower and connect with developments in the business community and society in general. In that sense, we have stopped living and breathing science alone, we like to stand firmly in the real world."

IN BRIEF



WORLD'S LARGEST CRATE BRIDGE RECORD

The student from study association ConcepT were full of bravado when they announced they wanted to build the world's largest bridge made of beer crates. Over the last few years this had been a battle between Eindhoven and Delft, but the civil engineering students at the UT wanted to join the battle. During the open days on Saturday 24 November, the students were

forced to admit their attempt had been unsuccessful. Kjeld Garritsen, chairman of the construction committee: "The crate bridge delegation from the TU Eindhoven was also present, it was a bitter-sweet moment for them. On the one hand they get to keep their record, but on the other hand they lose the opportunity to challenge our record."



GOLDEN MICROJEWEL FROM 3D PRINTER

Thanks to a laser technique that shoots ultra-small metal droplets, it is possible to print three-dimensional structures drop by drop. Not only simple 'stacks' such as pillars, but also complex overhanging structures such as a helix several millimetres high, and all this in pure gold. This makes it possible to print new 3D components of micrometre dimensions, for electronics or photonics for example. Researchers at Twente University recently presented their results in the scientific periodical Additive Manufacturing.

GALLERY PHASE 2

An open and dynamic environment for the development of solutions to future societal challenges: the ambition for the second phase of The Gallery in a nutshell. The plans were presented in October at the KOP 500 Business Event.

The Gallery is an image-defining complex at the entrance to the Twente University campus. Part of the building will be structured for maximum support of innovation processes. There will be spaces for ideation, bootcamps, concept development, prototyping and business development. There will also be large open spaces for conferences, lectures and workshops and 'hangouts', a coffee bar and seating areas. Furthermore, the environment should be flexible so that it can constantly move and change with the needs of the users.

FOLLOW-UP BREAST CANCER

Annemieke Witteveen's doctoral research shows that the number of follow-up checks for women that had been treated for breast cancer can be reduced by more than nine thousand check-ups a year. The follow-up checks should be more tailored to the risk of illness recurrence, so that the women with a low risk could possibly visit the hospital less often for a mammogram. Tailored follow-up checks prevent unnecessary stress on the patient, the care providers and the care budget.



UNIVERSITY OF THE NETHERLANDS

What's better than students paying entry fees to be allowed to take your lectures, jokes Aiko Pras as he looks back at his performance on the Universiteit van Nederland. The latest series of episodes of the Universiteit van Nederland sees two UT'ers take to the stage. One of them is Aiko Pras, professor of Internet Safety. His contribution focused on cyber attacks: what do you lose in the event of a significant attack? Djoerd Hiemstra also made an appearance in the series on big data. But what is it exactly and what makes big data so 'big'? In his lecture, Djoerd talked about all the ins and outs and showed that you don't have to be Marc Zuckerberg to work with big data. You can watch the lectures from the Universiteit van Nederland online: universiteitvannederland.nl.



TURBO-GRANTS

Four TURBO grants have been awarded in total for new medical engineering research proposals. The grants are part of the TURBO programme, a collaboration between Twente University and the Radboudumc. Research groups from both institutes can use a grant to expand on an innovative idea that is intended to lead to a subsequent

application with an external funding body. The four projects are:

De vier projecten zijn:

- A smart tumour-on-a-chip that imitates complex tumour structures to investigate ways to kill hypoxic cancer cells.
- A 3D tumour micro-environment for the brain
- A system, based on wearable sensors and smart algorithms, to measure resilience to support treatment decisions.
- A new pacemaker for the diaphragm that responds to the needs of the individual patients and as such contributes to more mobility and independence.



More information about these items can be found at: www.utwente.nl/en



“Many alumni astounded the NS employees with their knowledge”

A NIGHT OF TRAINSPOTTING WITH THE NATIONAL RAILWAYS (NS)

More than 110 UT alumni from Utrecht visited the head offices of the National Railways (NS) in their city last November. The theme ‘Train-spotting’ was used to talk about challenges related to logistics and maintenance and more.

BY **Arianne Colenbrander**
PHOTOGRAPHY **Own photos**

The UT alumni Geert Jan Bazuin (WB’90), head of fleet management, and Floris de Ruiter (WB’12), reliability engineer, got the evening off to a good start. They used a presentation to provide the attendees with an insight into the life of a train: how does the NS structure its asset management

and what is involved in the maintenance and modernisation of the trains?

Whereas the NS learnt by trial and error about the management of its fleet, Bazuin says it is especially important to focus on the reliability and sustainability of the trains. De Ruiter zoomed in on the different operational phases of a train and all maintenance involved, such as the introduction, the preventive and major maintenance and recycling the trains. Attendees were also given a glimpse into the procurement process of the new Sprinter and Intercity. The presentation was complete with the addition of the train’s wooden prototypes.

Using ‘old-fashioned’ train tickets, the attendees could then board onto various break-out sessions. There were workshops on change management, big data (lead by Computer Science and Philosophy alumnus Nick Oosterhof), logistics and modernisation and EMC.

The number of train enthusiasts among the alumni became apparent during the NS&Co game, with many alumni astounding the NS employees with their knowledge. Many trains were given away to the lucky winners. There was a long debrief among the alumni involving Grolsch, after which almost everyone travelled home by train.

Would you like to invite the UT alumni to your company or is there a company where you would like to have behind-the-scenes access? Let us know via alumni@utwente.nl. With 47,000 alumni spread across the world there is always a point of contact!



ALUMNI TOUR



UT ALUMNI ON THE MOVE

- **Anouk Baake (MSc BA'14)** After several jobs related to supply chain planning, **Erik Aaftink (TBK'96)** started as a Chief Product Officer for Intertoys in October 2018.
- After her studies, **Anouk Baake (MSc BA'14)** started working as a Data Analyst for Apple, and then managed to achieve a second Master's in Dublin while also working for Accenture as a Digital Marketing Analyst. In October 2018, she took up a position as a Junior Business Analyst at KLM Royal Dutch Airlines.
- **Rene Bouw (EE/INF'94)** has been a Senior Vice President, Chief Architect at RMS since October 2018. Before that, he worked for Microsoft in the Netherlands and the United States for 20 years.
- **Lieke Asma (MSc PSY'08)** graduated from the VU Amsterdam earlier this summer. Her research related to "free will" gained a lot of attention, including national newspapers such as Trouw and Volkskrant. Lieke started a postdoc at the Munich School for Philosophy in July 2018.
- Starting from November 2018, **Jasper Casteleijn (MSc PSTS'09)** has been working as an External Auditor for the European Commission. He previously worked as an auditor for SABIC and FedEx before that, he was an Engineer for Ridder Drive Systems.
- After his technical business administration studies, **Sander Dekker (TBK'04)** fulfilled various roles within Ballast Nedam during his 15 years with the company. He has been Director of Heijmans Infra since October 2018.
- **Piotr Derengowski (MSc BA'12)** started working for Amazon in Munich as a Business Analyst Customer Insights in November 2018. Before this, he worked in Hamburg and Berlin on Conversion Rate Optimization for Kreditech and Audible.
- **Hans-Martin Duringhof (WB'02)** started working as a Team Manager Emerging Technologies / Product Stream Autonomous Drive at Volvo Cars at the beginning of November 2018. In his role, Hans-Martin ensures that cars are also sustainable.
- **Michiel van Elzakker (EE'06)** has become an Architect / Team Leader at ASML from November 2018. He previously spent 10 years at ItoM after graduating Cum Laude from his Electrical Engineering course.
- After he completed his Applied Physics studies Cum Laude, **Julius de Hond (MSc AP'14)** started his doctoral degree at Amsterdam University. He has now been working as a Postdoctoral Associate for the Massachusetts Institute of Technology since October 2018.
- **Bram ter Horst (MSc PA'15/BA'16)** first spent 2 years as an Environmental Compliance Analyst at Pincvision, and as of November 2018 he joined Scania as a Development Engineer.
- After fulfilling several research roles in Cleveland (VS), Utrecht and Stockholm (Sweden), **Pim van Krieken (MSc TG'12)** has now started a Postdoctoral Researcher at Zurich University in November 2018.
- **Frederik Lindenaar (INF'98)** has been a Senior Program Manager/Product Owner at the RTL Group since November 2018. Before that, he spent 7 years at AT&T Labs, where he headed up the Business System Development team.
- As per October 2018, **Mariël Segers (MSc CS'14)** has fulfilled the role of Senior Product Specialist for bol.com. She worked for Wehkamp for four years before that, where she looked after E-commerce.
- **Carolien Somi (MSc PA'15)** started in October 2018 as a (Senior) Policy Advisor HDFEZ/KS for the Ministry of Finance.
- **Jeroen Steenbergen (BIT'04)** was appointed Director Operational Excellence at Standard Chartered Bank in October 2018. He previously worked at KPMG, BNP Paribas and Accenture in Financial Services.
- Since November 2018, **Kurt Peek (MSc AP&AM '11)** has been a Backend Engineer at Venmo in San Francisco. He previously worked as a Reservoir Geophysicist for Shell and Backend Engineer at IperLane.
- After her Instructional Design and Technology studies, **Judith Pankras (EST'96)** worked as an Instructional Designer for a few years. She then spent 16 years with PPG Industries and has now started working as a Regional Talent & Organizational Effectiveness Adviser for AkzoNobel in October 2018.
- In October 2018, **Menno van der Ploeg (CIT'00)** started his new job as a Project director at Boskalis. Before that, he fulfilled various roles within ProRail for 18 years after graduation.
- **Marion Post (CT'87)** started work at the Nederlandse Spoorwegen as Head of Quality NS Operations in October 2018. Before this job, she spent time working at Philips and ASML.
- **Wahbé Rezek (MSc IDE'17)** has been a Change Manager for ING since October 2018. During his studies he was very actively involved, for example, he was chairman of S.G. Dae-dalus and produced a series called 'International in Twente'.
- As from October 2018, **Peter ten Veldhuis (CT'92)** became a Project Director for Fluor. Before that, he worked for Technip and Chicago Bridge & Iron Company for many years.
- After completing his Business & IT studies with a Cum Laude degree, **Roel Veneberg (MSc BIT'14)** spent some years at Deloitte Nederland before returning to Twente. He has been working for Thales as an Information Security Officer since October 2018.
- From October 2018, **Floris Olde Weghuis (WB'02)** is fulfilling the role of Business Team Manager at Apollo Vredestein. He was previously a project manager at Van Gansewinkel and Koninklijke Gazelle.
- **Masrouh Zoghi (PhD'17)** graduated from Twente University last year. He now works as a Software Engineer for Google in Mountain View, California.

The most recent particulars can be found at twitter.com/alumniUTwente. Have you started a new job? Do you want to tell us about someone's special achievements or an award they won? Tips are welcome via alumni@utwente.nl

OF GERMANY



The first Alumni Tour of Germany was a great success. The Dutch Engineers Alumni Network (DEAN), a collaboration between TU Delft, TU Eindhoven, Wageningen University and the UT, arranged for the participants to have access to unique locations in Cologne, Frankfurt, Stuttgart, Munich, Hamburg and Berlin – and special encounters ensued. The kick-off took place in November at the European Space Agency (ESA) in Cologne. Other places visited included the Max Planck Institute in Stuttgart and the Dutch Embassy in Berlin.

COLOPHON ALUMNI NEWS

Questions, comments and suggestions: alumni@utwente.nl
Tel. +31 (0)53 489 2104
Twitter: @alumniUTwente

www.utwente.nl/alumni
- Changes of address
- Subscribe or unsubscribe digital newsletter
- Email forwarding request



From left to right Victor van der Chijs, Zakir Farahmand, Henk Hoving (De winter scholarship contributor), Khansa Dhau and Wilma van Ingen.

SDG DATAVIZ CAMP

During the *Sustainable Development Goals DataViz Camp*, 25 students and researchers worked on charting social inequalities. They split into multidisciplinary teams and got to work in DesignLab on eight challenges from organisations such as the Province of Overijssel, the Central Bureau for Statistics and Programa Estado de la Nación from Costa Rica. This event was made possible with help from University Fund Twente.



KIPAJI SCHOLARSHIP FOR ZAKIR FARAHMAND AND KHANSA DHAU

In September, the dreams of Afghan student Zakir Farahmand and Indonesian student Khansa Dhau came true: they were both able to start their two-year master's programme at Twente University.

Zakir and Khansa are the recipients of a Kipaji scholarship from the Kipaji Scholarship Fund. Entrepreneurs Job Elders, the two UT alumni and founders of spin-off Xsens, Casper Peeters and Per Slycke, established the fund that awards scholarships to talented people from developing countries to study at Twente University.

Alumni, relations and co-workers have been very generous to the Kipaji Scholarship Fund over the last few years, resulting in two students joining this year. Zakir hopes to improve the public transport system in Afghanistan after his Transportation Engineering and Management course, and Khansa wishes to gain knowledge on transforming the large waste mountains in her country into sustainable energy by taking the Sustainable Energy Technology course. In addition to the Kipaji Scholarship, Khansa was also awarded the Professor De Winter Scholarship for talented foreign students.



MARLEEN STOEL TAKES PART IN THE CYCLING WORLD CHAMPIONSHIPS

Marleen Stoel, third-year bachelor student of biomedical technology, participated in the cycling world championships for students that took place in August in Braga, Portugal. Though conditions with 40-degree temperatures didn't stop Marleen from finishing twelfth in the time trial and fifteenth in the road race. An excellent result and a great week for Marleen. She has learned a lot, met new people and most of all, pushed her boundaries. Marleen is grateful to the University Fund for their financial contribution.



ALEMBIC STUDYTOUR UNÁMONOS

After a year of preparations, 26 students from CT study association Alembic left for Argentina last summer. The motto was 'Unámonos', which means: Let's unite. They built relationships with companies, institutes

and universities. Places visited included a steel factory, a nuclear reactor, an agricultural faculty, an alcohol distillery and a winery. They also enjoyed the stunning national parks, vibrant cities and the warm Argentine culture.

KATHRIN SMETANA WINS PROFESSOR DE WINTER PRIZE

The Professor De Winter prize was bestowed upon Kathrin Smetana at the 57th dies natalis on Friday 30 November. She is a lecturer with the Mathematics of Computational Science unit at the Applied Mathematics department in the EWI faculty.

Smetana received the prize for her article 'Randomized local model order reduction' in which she presents a totally new, innovative approach to model order reduction. This article was published in the SIAM Journal on Scientific Computing, a leading periodical on scientific computing.

The university lecturer develops simplified mathematical models for computing-intensive problems. Her research is applied in many areas, for example when modelling complex container cranes, bridges and seismic waves.

The research by Kathrin Smetana on model order reduction is an example of the intensive collaboration between Münster University and Twente University.



The Professor De Winter prize, named after the professor who passed away in 2005, is an international publication award for female top talent. The prize is intended to be an acknowledgment of excellent scientific research and an impetus for the further development of a scientific career. The prize comprises a 2,500 euro cash prize and a certificate, gifted by the Professor De Winter Fund set up by the late Mrs. De Winter. After her death in 2013, her heirs – UT alumnus Henk Hoving and his partner Thijs van Reijn – decided to continue the annual donation to the University Fund. This is the twelfth anniversary of the prize.



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On behalf of the students and researchers:
Many thanks for your involvement and support!

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DIES NATALIS



The UT's 57th birthday on Friday 30 November was all about talent. This theme became apparent in the speech by rector Thom Palstra. In the Waaier, he called for attracting, encouraging, and - most of all - sharing talent.

Technical philosopher Peter-Paul Verbeek was appointed university professor during the ceremony. Verbeek will propagate the high tech, human touch profile and wants to further develop the internal connection between technology and society.



Prior to the dies natalis, some sixty alumni from between 1986 and 2009 returned to the campus for a reunion. In the DesignLab they could look back at student life, and they were entertained with a lecture and lunch. Executive Board member Mirjam Bult welcomed the visitors: 'A lot has changed at the UT, but at the same time everything stays the same.'

ALUMNI TALKS



The second edition of the Alumni Talks took place in the Vrijhof on 5 October. Joost van Kerkhof (EL '90, PhD '94), COO of the UT spin-off Phix, talked about different applications of photonics in the future. Bas Lansdorp (WB '03) outlined his initial ideas for Mars One, the establishment of a permanent colony on Mars. Wifi inventor Cees Links (TW '82), once referred to himself as a backward, idiotic and stubborn go-getter'. However, these characteristics did ensure he was invited for a coffee with Apple boss Steve Jobs, who subsequently started using his WiFi technology and as such created a massive breakthrough. Ank Bijleveld (BSK '86) indicated where her focus and priorities lie as a Dutch Minister of Defence: building trust, a personal approach and decisiveness.



The sports fields and facilities on campus have undergone a major metamorphosis over the last two years. The athletics track was given a spruce up; three lanes were given a synthetic top layer and three lanes were asphalted. There are also long and high jumping facilities on the track and an incline, both uphill and downhill. A bootcamp course with fitness equipment has been installed on blue artificial grass adjacent to the athletics track. SOURCE U-Today PHOTOGRAPHY UT archives and Frans Nikkerls

SPORT



The sports centre itself was also given a facelift. The central hall and entrance were renovated. The building was given fresh and airy colours and the reception inside was moved closer to the entrance. Outside there's a new artificial grass pitch for the footballers of vv Drienerlo and a new multi-purpose pitch for the baseball, softball and netball players.

The equestrian field next to the Bosch Farm has become a filled-surface pitch for lacrosse, hockey and even football. Hockey is also

played on a new filled-surface pitch and the Ludica tennis players have four new gravel courts. More and more external parties are finding their way to the Sports Centre. There is an agreement with ROC Sport en Bewegen for the use of the facilities during the day. There is also a collaboration with the Football Equals Foundation football school and with Topvorm Twente, the (sports) physiotherapy in the office wing. They use the fitness space during the day, which has also been completely refurbished.



Fluid physicist Detlef Lohse from Twente University calls it the 'golden era' for his discipline. Whether it concerns the behaviour of a single droplet or bubble, or turbulent currents in oceans or the universe: it always generates countless new research questions. At the end of November, Lohse received one of the Balzan prizes: the 'Italian-Swiss Nobel prize'. Specifically, for the diversity of his work. This magazine's editor was present. BY Wiebe van der Veen PHOTOGRAPHY Balzan Foundation, Photo Carletti

THE GOLDEN ERA OF FLUID DYNAMICS

BALZAN PRIZE 2018 FOR DETLEF LOHSE

The Italian president, Sergio Mattarella, presented the five prizes in Rome: four to scientists, one to a humanitarian organisation. The event took place at the venerable Accademia dei Lincei in Rome, an academic society with a history dating back to 1603.

Lohse won the prize - according to the jury - "for his extraordinary contributions to the most diverse areas of fluid dynamics", such as turbulence, 'sonoluminescence' and the properties of bubbles and droplets down to microscopic level.

"why is there such a significant
difference between a drop of oil in water
and a drop of water in oil"

Ouzo effect

His acknowledgements saw the UT professor delve into the two questions he is regularly asked: how do you find problems and projects to work on? And: what is the difference between fundamental research and applied research? His answer to the first question was very decisive: 'Be inquisitive!', and to the second he replied 'there isn't one, in principle'. The day before, when the prize winners were given the opportunity to explain their work, Lohse presented examples of this approach. He is internationally known for his explanation of sono-

luminescence: a bubble in fluid starts emitting short bursts of light when excited by ultrasound and becomes very hot. Or another curious question: we know that the drink ouzo or pernod becomes slightly opaque after adding water. But what exactly happens in that drop of ouzo? High-speed images and simulations provide insight. For instance, researchers learn more about the behaviour of complex mixed fluids such as those for medical diagnostics or in inkjet and 3D printing.

Turbulent

Another large topic in Lohse's group is turbulence: one of the most complex phenomena in physics that we experience daily. We know it from our air travel, but the air around us also moves turbulently, as does our blood in the aorta. An interesting question is whether the turbulence that occurs on a large scale, in the ocean or the universe, can be scaled down to the laboratory. A recent publication by two of Lohse's doctoral candidates shows it is possible, with conditions. A lot of computing power was required, and approximately 2000 powerful computers throughout Europe were enlisted. The experiments, in the so-called Twente Taylor-Couette facility that generates turbulent currents, were also extremely demanding. It's the signature of the work by Lohse and his people: a combination of new theory formation and experiments. It's no wonder the professor already has more than enough fascinating research questions lined up to spend his prize money on. It starts with the



THE BALZAN PRIZE

The Balzan Prize is named after Eugenio Balzan (1874-1953). He started as an editing assistant with the Corriere della Sera newspaper and worked his way up to co-owner of the publishing company. He left a large fortune. His daughter Lina decided to use this inheritance to set up prizes for science, culture and charitable causes. Scientists are required to spend half of the prize money, 750,000 Swiss Francs (approximately 670.000 euros), on a new research project for young talent. Major scientists like the mathematician Andrej Kolmogorov and the astrophysicist Jan-Hendrik Oort were previous recipients of the prize, as well as composers such as Paul Hindemith and György Ligeti, and the benefactor Mother Teresa. The 2018 prize winners, alongside Lohse: biologist Eva Kondorosi, historian Jürgen Osterhammel, sociologist Marilyn Strathern and humanitarian organisation Terre des Hommes.



curiosity-inducing question about why there is such a significant difference between a drop of oil in water and a drop of water in oil.

Max Planck Medal

Shortly before Lohse was to travel to Rome to receive the prize, he was informed about another award bestowed upon him: the Max Planck Medal. This award will be presented in the spring of 2019 by the Deutsche Physikalische Gesellschaft and 'the world's greatest' from the history of theoretical physics have been recipients of the medal. Lohse previously also received the Spinoza Prize, the Simon Stevin Master Prize and the Fluid Dynamics Prize from the American Physical Society, to name but a few. This is also a golden era for Lohse, it seems.



EVERYTHING IS FOCUSED ON GROWTH IN VIETNAM



A message. The Dutch ambassador will be at her desk a little later, she is stuck in traffic. "It's chaos here. The mopeds and scooters are whizzing past left and right." Since August, Vietnam is the workplace of Elsbeth Akkerman, UT alumna of Public Administration. BY Ditta op den Dries PHOTOGRAPHY Own photos

LITERALLY EVERYTHING IN HANOI IS AIMED AT GROWTH. ENTREPRENEURIAL SPIRIT IS EMANATING FROM EVERYTHING.

She feels privileged with her recent appointment. She feels lots of lines meet in Vietnam. "Vietnam is a very special country, in the heart of Asia. It is strategically situated in a large economic bloc and is very focused on internationalisation and closing trade agreements, also with the EU. Signs of a decade of robust economic growth can be found in the capital Hanoi, home of the Dutch embassy. "Literally everything is aimed at growth here. Entrepreneurial spirit is emanating from everything."

As a student of International Public Administration, Elsbeth Akkerman already knew what motives drove her. She values being valuable and making a difference. "That is why I very consciously chose for the government after I graduated in 1997. I am given every opportunity to realise these motives in practice. It is something the UT can take credit for, because this inspiration was formed in Enschede." Akkerman started at the ministry of Economic Affairs, worked at the ministry of Agriculture and later made the move to the ministry of Foreign Affairs.

Polder model

In her current role as the ambassador in Vietnam, she is responsible - on behalf of the Netherlands - for propagating the importance of good cooperation between government, business community, scientific institutes and societal organisations to achieve truly sustainable solutions: the Dutch polder model. Earning money abroad is fine, but not to the detriment of humans and the environment.

Vietnam is experiencing large economic growth, but also deals with

many challenges; for example, in agriculture and water management. Vietnam is a delta country too and the Mekong Delta in the south is situated below sea level, just like large parts of the Netherlands. Floods occur sometimes, other times it's dry. Dutch companies and universities have a wealth of experience and knowledge in these areas and could provide the ultimate contribution to smart and structural solutions that in turn contribute to the global sustainability agenda.

In Vietnam, the concept of 'working with nature' as opposed to 'against nature' is still rather unknown, says Akkerman. "The Netherlands can help, and we are taking a close interest in what our universities are doing in this area. This is also true for our knowledge related to agriculture. Diversification is important for Vietnamese agriculture; at the moment, rice is most commonly grown." The Vietnamese need for knowledge and collaboration offers opportunities for the Dutch business community and scientific institutes, and the embassy makes an effort to capitalise on these opportunities.

The Netherlands and Vietnam are celebrating 45 years of bilateral ties this year. "We organised the so-called Dutch days in four large Vietnamese cities. We explored collaboration in topics such as water management, agricultural transition, circular economy and smart cities. It genuinely makes me so proud I can play a part in this." She knows that the UT also possesses a trove of knowledge in these areas. "Many Dutch universities and universities of applied science are active in Vietnam. In the short time I have been here, I have seen appearances

from Wageningen, Delft, Eindhoven, Saxion and Van Hall Larenstein. It is a given that the UT is more than welcome too. I am hoping for contact." As a matter of fact, the number of Vietnamese alumni is considerable too: in 2017 alone, 750 students came to the Netherlands.

"It is a given that the UT is more than welcome. I am hoping for contact"

The diary of the Dutch ambassador in Hanoi is well-filled and very diverse. The results of a random week: together with Henk Ovink, the Water Envoy, she spoke at various ministries about the Dutch role in the implementation of the Mekong Delta Plan, she attended the launch of the Formula 1 which is to take place in Vietnam in 2020 and with which the city of Hanoi aims to put itself on the map to foreign investors, and after that there were two Dutch Days in Can Tho where she took to the bicycle. "Because it is fun, but also to underline that it is a healthy and sustainable way to solve traffic problems." The finale of the week was when she opened Hanoi Pride with the Dutch message that diversity and respect for each other are the core values of an inclusive society. "Just like in Amsterdam, the LGBTI community in Hanoi really knows how to get the party started and this Dutch ambassador can party like the best of them, you know! You should be able to be who you are and love who you want. That's not possible in every country. It makes you realise how lucky we are to be Dutch."

What do you get when you gather about fifty alumni? The current and former residents of Huize Leopold soon found out. The house at Campuslaan 53 organised its first old housemates' day in October. BY **Marieke Vroom** PHOTOGRAPHY **Frans Nikkels**

HUIZE LEOPOLD

FIFTY (OLD) HOUSEMATES, ZEUVEN REEËN AND TWO STRAY CATS

Ding dong dang! The familiar tannoy sounds from the Dutch national railways rings through the corridors of the campus flat. "Are you coming into the living room?" Eelkje Kooistra (Mechanical Engineering master) speaks to the housemates still studying in their rooms via the intercom. It is a Monday evening during exam week. Those eating at home today are having kale mash. Completely home-made, because the residents of Huize Leopold would rather not use packets and sachets. "This announcement system is very useful, but it does create a kind of Pavlov effect" says Johanneke ten Broeke (Technical Medicine bachelor). "Now every time I hear a public address at the train station, it makes me feel hungry."

Nickname

The first students moved into the house in 1966, when it was still just called Campuslaan 53. Later it became Diaspora, as the housemates came from every corner of the country. The current name originates from a red tomcat. He was actually called The Brain, but was given the nickname Leopold. The cat kept the fourteen residents company, together with his counterpart Pinky. The cats were named after a cartoon about two labora-

tory mice who wanted to conquer the world. The Brain has been nowhere to be seen for a while now, and cat Pinky is not a regular guest anymore, says Karina Boekhoudt (Computer Science premaster). "She's still around somewhere, but she's probably found a house where she gets even more food."

The human ex-residents do return to the house willingly. The current group tracked down as many alumni as possible for the ex-housemates' day. On the 27 October, the common room was full of residents from different generations: from new graduates to pensioners. "At first we thought: there are lots of old people, should we be extra formal to them?" says Laura Oosterom (Industrial Design master). "But they were horrified when we were."

Close-knit club

Frans Carelsen, chemical engineering alumnus, lived at Campuslaan 53 from 1970 to 1975. He has always kept in touch regularly with his housemates from back then. "We attended each other's graduations, weddings and visited when new babies were born. Our wives also get along great. We still have a little getaway every year, in the Netherlands or abroad. It was great to be at the old



"My room is no longer.
It's a laundry room now"
- Ex-resident Frans Carelsen

housemates' day, to meet residents from before and after us."

The alumni were given a tour of their old house, with the name not the only things that changed over the years. In 2001, all residents had to be reaccommodated due to a renovation. The kitchen was extended, the house was given a balcony and an extra room was added on. Frans discovered that his room no longer exists. "It's a laundry room now," he says, laughing. The showers were also renovated. "In my time, only men lived here and showering was done in one open space. Women now also live in the house and the showers have been screened off."

Klootschieten

After the tour there was time for a game of klootschieten, a local ball-throwing game. In mixed teams and with a cart full of beer, the current and former housemates completed a course across the campus where the aim was to get the 'kloot' (a wooden ball weighted with lead) across the finish line in as few throws as possible.

Klootschieten was discovered a few years ago by a few housemates on a weekend away and is now the

ultimate house sport. Karina: "There wasn't a club for students yet. We thought that was strange; it's a local sport. That's why we founded a club ourselves, with Leopold as the clubhouse." And it all got a bit out of hand, she says. The Drienerlose Klootschietvereniging 'de Zeuven Reeën' (pronounced as: zeu'm reejn) now has about eighty members.

A successful day

Both the new and older generations of housemates agreed it was a successful day. "We had a great time and the old housemates were really super enthusiastic. The group that goes on holiday every year even invited us to come visit sometimes," says Johanneke. "This group is really well-suited," says Frans. "They organised nice activities and they cooked us a great meal."

The alumnus hadn't expected the latter from the student house. "We mainly cooked as cheaply as possible," he says, and that was sometimes detrimental to the flavours. It's why he had already decided, together with a few other ex-residents, that they would go to a restaurant if the food wasn't up to scratch. "But that wasn't necessary, it was very good!"



Want to add a profile of your student house (current or former) on [facebook.com/AlumniUT/](https://www.facebook.com/AlumniUT/)? Get in touch via alumni@utwente.nl



TECHNOLOGY AND PEOPLE IN ONE DREAM JOB

"I ended up at Xsens via a headhunter. Bullseye. The combination of technology and people suits me perfectly"

He is sitting around the table with Toyota and other major car manufacturers to sell sensor systems that digitally chart body movements. He flies across the globe to visit clients in Europe, the Middle East and Africa. Peter Hartman works as a business developer for Xsens Technologies in Enschede. BY Frederike Krommendijk PHOTOGRAPHY Rikkert Harink

Hartman studied biomedical technology at Twente University. There was no immediate work in the region for this discipline, so he applied for a job with machine manufacturer VDL ETG in Almelo. "I liked it there and as well as the engineering, I also gained experience in sales. That aligned well with the master's degree in communication that I took for a while. But the biomedical side kept calling. I ended up at Xsens via a headhunter. Bullseye. The combination of technology and people suits me perfectly." His job as a business developer allows him to utilise his sales talents and his biomedical knowledge within a stone's throw of his old university.

"Xsens makes systems that uses sensors to create digital visualisations of body movements. These images can be used for ergonomics within companies, but also for top athletes or animation. For example, during my first year I was in talks with NOC-NSF for applications in sport. Now I concentrate on companies that wish to improve ergonomics for their employees."

Large clients include the Toyota car manufacturing plants. "You can imagine that these companies are keen to improve the ergonomics of their production process. Our sensors measure the angles of the joints in relation to each other. Simply put: how you move. This could be done using complete suits, but also with loose sensors that are attached using Velcro. The movements are visualised digitally. For example, a car manufacturer can measure employees on the assembly line and optimise the production process based on that data. Maybe a walkway should be shorter, or an assembly line should be higher. It prevents sickness absence and it may even result in time savings.

The system is also able to get great results in the medical sector, for example if a patient's gait pattern needs to be analysed. "The sensors collect a massive box of data that can be compared with someone with a normal gait pattern. This is interesting for clinical universities, for example. We try to engage in the client's thought process about how to best use the system. We build up a relationship with the client. For example, if we have a new software release, we will allow our clients to use it first so that we can collect more feedback for further improvements to the product. The interaction works well.

In his own words, Peter has a 'great job'. An added advantage is that he travels the world, but still has the comfort of being in Twente and his hometown of Rossum. At the UT, Xsens also collaborates as a sponsor on the Wearable Robotics Lab. "And we also have graduates here. It means I still have a connection with the UT. Of course, we try to get the best people from there to join us. There is a glaring lack of software engineers and good salespeople in particular. The atmosphere at Xsense is good, like one big family. New enthusiasts are very welcome."

AGENDA 2019

Wednesday 13 - Thursday 14 February
Career Fair, Bedrijvendagen Twente

Saturday 11 May
Batavierenrace

Thursday 20 June
Entrepreneurial Day

Thursday 1 - Tuesday 20 August
Summer School CuriousU

Monday 2 September
Opening Academic Year

Friday 4 October
Alumni Talks

Further information:
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COLOPHON

University of Twente is the magazine for alumni and partners of the University of Twente. and an edition of Marketing & Communications

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CONCEPT AND DESIGN
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MagSite.nl, Wormer

PRINTED BY
SMG groep Hasselt

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ISSN 2210-8173
OPLAGE 36.000

Printed on FSC-certified paper



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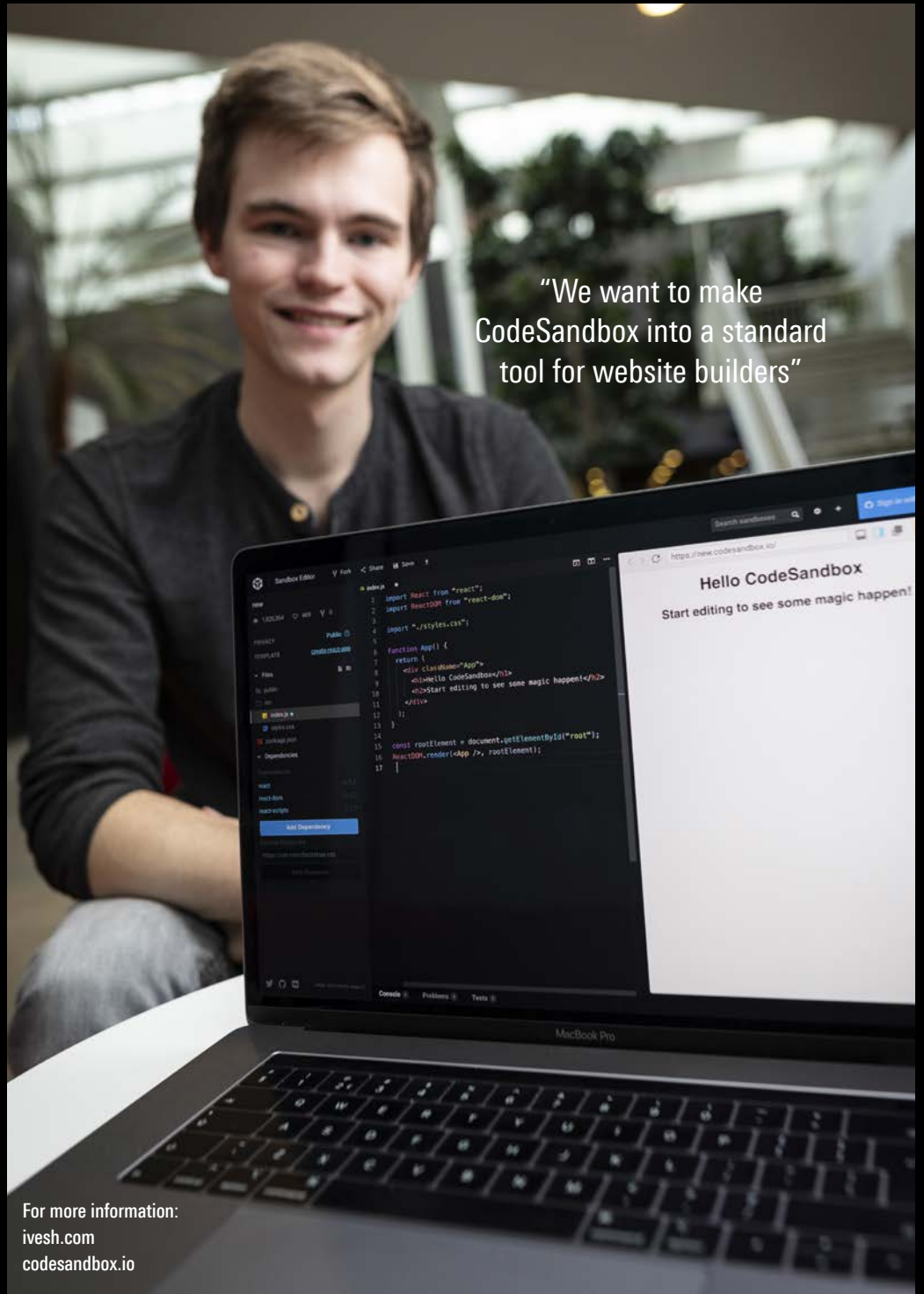
BY Hans van Eerden PHOTOGRAPHY Rikkert Harink

SANDBOX FOR WEBSITE BUILDERS

Interactive sites such as web shops are complex to build. Facebook created its own tool, React, for programming all interfaces. In turn, this open source tool is complicated too. This is what UT student Ives van Hoorne noticed when, after completing his secondary education in 2015, he started working at online auction website Catawiki in Assen. He continued to work part-time for Catawiki his Technical Computer Science course at the UT. "I thought the theoretical part was cool, but the programming assignments were very basic."

Van Hoorne had time to spare for the development of CodeSandbox for React-users. The tool offers a simple online editor and an environment for working together and experimenting, the sandbox, on code development. Together with fellow student Bas Buursma, Van Hoorne founded the company by the same name. The website pulls half a million visitors per month, 700 of them are paying customers. Large high-tech companies showed an interest and there were early whispers of an acquisition. But we think it's more interesting to gain a lot of experience with a start-up. We want to make CodeSandbox into a standard tool for website builders.

In October, Van Hoorne won the More than a Degree Award for 'most enterprising student', presented by the Student Union. He doesn't wear his student hat a lot anymore, his entrepreneurial hat takes almost fulltime precedence. Recently with support from UT's well-known TOP scheme. "It helps us to continue looking for funding without stress." CodeSandbox has outgrown the playground by now.



"We want to make CodeSandbox into a standard tool for website builders"

For more information:
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