UNIVERSITY OF TWENTE.

GLOBAL IMPACT

MEET THE WORLD OF ITC

u today | special

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Content

Colophon

This journalistic, independent special edition of U-Today was drawn up together with the Faculty of Geo-Information Science and Earth Observation.

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Capacity building and institutional development lies at our heart

The use of geo-information is rapidly growing worldwide. Geographical information systems and remote sensing tools are indispensable in solving real-world problems and complex issues concerning health care, food security, climate, water, urban planning, security and land scarcity.

These societal challenges require extensive exploration of new opportunities and applications of new technology, as well as well-trained professionals with strong affinity with technology and systems. Creative thinkers who are inspired by large-scale, complex challenges and willing and able to look beyond the obvious solution.

The values that drive us are:
- Societal impact: making a real difference
- Synergy: excellence in combinations
- Entrepreneurship and innovation
- Internationalization: tomorrow's global citizens

Since ITC's inception in 1950, we have developed a broad global network of partners, and we want to continue to actively pursue and elaborate our international partnerships within our knowledge domains. At the heart of ITC's activities lies capacity building and institutional development, the processes by which individuals, groups and organizations strengthen their ability to carry out their functions and pursue their goals effectively and efficiently.

We aim to continue to be an internationally recognized leading research entity in geospatial sciences, with an emphasis on geo-information science and earth observation. We maintain our focus on fundamental and problem-solving research, with an eye for those complex global challenges where spatial information can make a real difference.

In this special we provide an insight into our working field and our way of working together with allies all over the globe.

Faculty Board ITC

Text: **Michaela Nesvarova**
Photo: **Rikkert Harink**

If you have ever visited ITC, you know that this faculty is 'something else'. It's different in its atmosphere, approach and people. Where exactly lies its 'X factor'? We've asked Professor Tom Veldkamp, who has been the dean of ITC for nearly eight years.

'We are still students' number one choice'

DEAN TOM VELDKAMP EXPLAINS WHAT MAKES ITC UNIQUE

What is the one thing everyone should know about ITC? What sets the faculty apart?
'Our mission for development cooperation in the Global South. We work on a basis of equal partnership. Our projects are driven by local stakeholders in the countries where we want to make a difference. Our work is demand driven: we take real-life problems and think about what technology and solutions we can make to actually solve these problems. ITC education and research involve very integrated chains of activities and even our daily business operations are tailored to serve our partners. This approach sets up apart from other faculties and disciplines that are mostly curiosity driven. We work on real issues, helping people that face real disasters.'

Besides this approach and your expertise, how does ITC differ from other faculties at the University of Twente?
'We offer only postgraduate education, meaning we only have Master and PhD students, no Bachelor students, and that the vast majority of our students comes from outside of Europe. All of this contributes to a different atmosphere. Students are generally a bit older and highly motivated. If it comes to quality and reputation, we are still the students' number one choice. If there were more scholarships available, we could increase the number of students tenfold. Almost every university nowadays wants to be more international, so it is a tough business. We're proud to be maintaining our market share despite the competition.'

'ITC Faculty is world-famous except for in the Netherlands'

Let's look into the future. Vision2020 is the UT's perspective on the future, how does it impact ITC?
'As UT we are currently in the middle of the organizational change, so it's too soon to tell, but I hope that it will create a more equal playing field among faculties and bring out more initiatives that are closer to our mission. If you want to be truly international and different, working with local

'We work on real issues, helping people that face real disasters'

stakeholders in the Global South could be the way to go. However, that is something you need to commit to on a long-term basis, something you have to invest in - and scientists are often not prepared for that. When we get involved in developing countries, we start with small initiatives like a short course or a workshop. You start small, but it raises awareness, local people become more willing to invest, students start coming to us and this eventually leads to joint programs and projects - often combined education and research. It's a snowball effect, but it takes five to ten years to happen. Other faculties and researchers are not always used to such long-term goals. It's a completely different game.'
As I understand, ITC could offer guidance in this regard. 'Naturally, we are willing to share our network, because it is difficult for other faculties to get started. However, first they have to realize it needs to be a long-term commitment that requires people to work in places like Africa or Asia.'

Do you think the collaboration with other faculties will improve after ITC moves to the UT campus?
'Moving to the campus will hopefully increase informal communication among people, raise awareness and curiosity about ITC. We are not always seen as a part of the university. Because we have no physical presence there, we are almost invisible. Being located on the campus will help with this issue, but I don't think it will lead to a boom in collaboration, because our work does not take place on the campus, it happens abroad.'

What makes you most proud about being the dean of ITC?
'Happy customers, meaning our students and stakeholders. That we are asked back to do new projects. When you work in African countries, for example, you have to be aware of cultural biases, be able to communicate with people of different backgrounds. You can't have the 'I did research and I know everything' attitude, it will not work there. You always need to be accepted by the locals. The cultural context is everything – we train our students to always consider the cultural context and we do as we preach. This makes our approach unique. We are fundamentally different.'

What do you hope ITC will achieve in the future?
'Recognition within the Netherlands. We are world-famous except for in the Netherlands.' ●

Text: **Michaela Nesvarova**
Photo: **Gijs van Ouwerkerk**

Rescuing people with drones

If an earthquake or another disaster strikes, fast rescue of surviving victims is of the utmost importance. Yet, large areas are often impacted and hundreds of buildings collapsed, which makes it nearly impossible for rescue teams to know where to search for survivors. Within project INACHUS, ITC Faculty is therefore working towards a system that will make finding victims quicker. How? Thanks to drones and 3D models.

INACHUS is a FP7 Project that aims to support post-disaster search and rescue forces. The people who arrive on the scene after a disastrous event need to know where to start digging. They need to use their time well and focus on places where people could have actually survived,' says Professor Norman Kerle, ITC researcher involved in the project.

Where to look for survivors?

After a major event, such as an earthquake, the International Charter 'Space and Major Disasters' gets automatically activated to provide satellite-based information and the first assessments of the damage. If the extent of the crisis requires local deployment of search and rescue forces, the INACHUS system will come into play. 'Earthquakes, for example, happen unexpectedly and can be truly destructive. They can affect hundreds of thousands of people, which means there are bound to be survivors – but where?' continues Kerle.

'There are bound to be survivors - but where?'

'Rescue teams usually arrive on the ground several days after the disaster and what they find is rubble, chaos and people in shock. That is why our job is to provide information on which places to prioritize. The first step is to do so called dasymetric mapping - to identify areas where there were a lot of people at the time of the event. If it, let's say, happened at noon on a week day, people were likely in office buildings, not in their homes,' explains Kerle.

Automated 3D modelling

ITC's main task within INACHUS is to use UAVs (unmanned aerial vehicles) to provide detailed damage mapping. For that, ITC researchers use relatively small drones, which serve as their eyes in the sky and take a lot of images. These photos are then used to create highly detailed 3D models of the affected areas and buildings.

'These models are absolutely necessary. Without them, we can't perform detailed damage assessment,

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Shauntelle Olivia Ricketts (26) is studying towards her Master's degree with a specialization in Land Administration. 'In my study I am learning about the documentation of tenure rights and managing people's relationship with land. In Jamaica, where I am from, there is no specific Master's degree for this study. Plus, ITC Faculty is known as

nor estimate the locations of spaces and cavities in the collapsed buildings where people could have survived, because satellite images only give us a view from above – they don't show how many floors of the building have crushed, for instance,' clarifies Kerle. 'Now, our task is to develop a methodology that allows the drones to optimize the 3D model data acquisition, to carry out the damage mapping automatically, and consequently tell the rescue teams where to look.'

Drones and ground-based robots

Once the search teams know which places to prioritize, it is time to deploy ground based technology included in the INACHUS system. Among others, rescuers will be able to use instruments that detect mobile phone signals or robots equipped with cameras, radar sensors and a 'chemical nose' that go into collapsed buildings and detect the presence of humans. Development of these technologies is, however, in the hands of other INACHUS project partners.

'We have also done tests with TNT and explosions'

'The end product of the INACHUS project should be a comprehensive system that allows rescue teams to use all of these different elements – satellite images, drones, resulting 3D models, detectors and robots,' says Kerle. 'ITC's main job is to ensure that the 3D modelling can be done automatically, and doesn't require any expert help, because the whole system should be relatively easy to use. In fact, ITC is also in charge of creating training materials for the rescue and search teams.'

Disasters and terrorist attacks

At the moment, INACHUS is still an ongoing project and should last another two years. The project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration. 'The next challenge is to bring our theory into practice,' says Kerle. 'First, we will have to test the system in realistic scenarios, such as in buildings that are being demolished or in special facilities. And - because the system should not only be useful after natural disasters, but also after terrorist attacks - we have also done tests with TNT and explosions near and inside buildings.' ●

the crème de la crème of these institutions and many of my lecturers went here, so it has always been a dream of mine to go.'

Ricketts claims that her program has drastically changed her mind-set, causing her to think in an increasingly global perspective.

'I remember when I first arrived I had a very particular idea of what this study was. Then while I was talking to someone I discovered that he had a different impression, and I even thought he was mistaken. Now my way of thinking has completely changed. I can even track exactly when my views and ways of thinking about problems started to grow.'

'I plan to bring my knowledge back home, especially since there are not that many professionals in this field there. I really hope to tap into this domain, specifically in research. In Jamaica we don't use the methods I have learned here; instead we use more conventional methods, so I hope to expose them to this new approach.'

Health is one of the most prominent topics and one of the main sustainable goals of today's world. Diseases, often preventable and easily cured, have a big social and economic impact, especially in less developed countries, and all diseases spread over space and time, which means they come with an important geographical component. Further development of the scientific domain of Geo-Health is therefore just as important.

'One world, one health'

ITC'S WORK IN THE FIELD OF GEO-HEALTH

Text: **Michaela Nesvarova**
Photo: **Shutterstock**

'Geo-Health focuses on the connection between people, location, time and health. It's about understanding the linkages between people's health and their physical and social environment,' explains Sherif Amer, one of the ITC researchers involved in this field.
'There are two main subgroups of Geo-Health: 'spatial epidemiology' which focusses on diseases, and 'geography of healthcare provision' which centers on delivery of medical services.'
In other words, the domain of Geo-Health aims to use Geo-information systems and earth observation (EO) to address health related issues. This means answering questions such as: How can geo-information improve the quality and accessibility of health care? What is the distribution of disease over space and time, and what are the risk factors involved?

Where, when and why

Although it is not yet widely developed, Geo-Health is certainly a growing field with a vital role to play. 'ITC generally focuses on developing countries, and in those countries diseases like cholera, malaria or diarrhea have a huge impact on people's lives,' says Prof. Alfred Stein from ITC. 'These diseases could be treated and controlled by, for instance, better access to water, better hygiene, or by closing open dump sites. However, to control the problem, you first need to know where, when and why it occurs. You need to monitor it, visualize it and explain it.' That is precisely where Geo-Health experts come into play.
Earth observation and geo-information systems can be used, among other things, to map diseases or to plan where health facilities should be placed. It can, for example, serve for analysis, forecasting and mapping of where and when cholera is most likely to spread, and most importantly for planning interventions to prevent an epidemic.
'We can identify water ponds and other places, such as rice fields, where people can get easily infected. Thanks to that we can warn stakeholders about a possible epidemic and public health institutions can then take appropriate measures,' clarifies Amer.

ITC is helping WHO in Mosul

Another great example of how Geo-Health can help with current issues is ITC's involvement in Mosul, a city in Iraq that has recently been liberated from Islamic State. ITC has been collaborating with the World Health Organization (WHO) for the past year, helping WHO in the context of the humanitarian response to the Mosul operation. For WHO Iraq, safeguarding access to secondary health care, and having contingency plans available was of critical importance.

'We were approached by the WHO Iraqi country office last year. It was a follow up on an ITC short course during which it was suggested that ITC could help WHO to identify the best locations for field hospitals serving local refugees around Mosul,' explains Ellen-Wien Augustijn, one of the ITC researchers involved in the collaboration with WHO.
'WHO anticipated that the Mosul frontline and the number of refugees would be very dynamic, meaning that the most suitable locations for hospitals could change over time,' continues Amer. 'Our joint task with WHO was to prepare several scenarios and identify the best hospital locations depending on access and the time needed to reach these hospitals. We also identified which hospitals would be the most suitable for patients with various injuries, how many patients each facility could accommodate and so on. This project nicely shows how GIS and EO can be applied in situations of emergency and humanitarian crises.'

'ITC can help to identify the best locations for field hospitals'

'More than just making a map'

'As you can see, Geo-Health is about much more than just making a map,' concludes Prof. Stein. 'Our end goal is to help to eradicate diseases. Health is such an important topic nowadays. We have one world, one health. People fly all over the planet, spreading diseases left and right. Take the ZIKA virus or SARS, for instance. We need to better understand these mobility patterns and monitor public health.'
ITC is busy in this regard. Even though the faculty doesn't yet have a separate group dedicated to Geo-Health, it is involved in many research projects on the topic and is active in a number of national and international collaborations. Prof. Stein hopes for further developments in the future: 'We have been offering our MOOC on Geo-Health for years and it has been very popular. The interest is certainly there and we hope we might even be able to offer a Master course on Geo-Health one day. Appointing a full professor of Geo-Health will be the first step.' ●

Each year Africa alone sustains post-harvest losses of fruit and vegetables worth 48 billion dollars. CHEETAH is there to help. This app, initiated by ITC researcher Valentine Venus, aims to supply food transporters, growers and traders with relevant information and therefore reduce these massive losses of produce.

CHEETAH: App with a societal impact

CHEETAH, an acronym for 'Chains of Horticultural Intelligence; towards Efficiency and Equity in Agro-Food Trade along the trans-Africa Highway', is a smartphone application that allows post-harvest losses during crop transport to be monitored. It uses crowd-sourcing and artificial intelligence to map issues such as unforeseen delays and poor road conditions. In 2014, CHEETAH was even awarded the first prize in the App Challenge of the European Space Agency (ESA).

Harvest rots before reaching the market

Between 20% to 50% of the vegetables and fruit losses in West Africa occur post harvest. Therefore, in some cases, half of the harvest is unfit for human consumption by the time it reaches the market. Why? There are considerable delays during crop transport, and these cause a portion of the harvest to rot in the truck. Drivers experience many time-consuming stops on the road during which they often have to pay bribes to police or people posing as police. Over a five-day journey, it is not unusual for traders to spend 10% of their margin on bribes.

A large part of the harvest is also lost due to vibrations caused by poor road infrastructure. Each day scores of lorries laden with pineapples, mangos, tomatoes, onions and other fresh vegetables start the 1,000 km long trip from landlocked Burkina Faso to Accra, Ghana's capital on the Atlantic coast. The journey from Ouagadougou to Accra —along smooth and tarred roads in the north and bumpy and unpaved roads in the south—should take between seven and twelve hours, but by the time it gets to market, often two days later, most of the transported produce is perished.

Produce decomposes fastest when the trucks travel on bumpy roads over long periods in environments that are hot, dry, sun-drenched or stuffy. Under these conditions, the spoilage rate varies between 50% and 100%. If they move over smooth roads through tall forests, that provide shade and coolness as well as humid air with plenty of circulation, only 25% of produce spoils. And if the trip takes one day instead of two, losses drop to 15%.

Real-life test

'We are now on the brink of equipping 200 lorry drivers with our CHEETAH app in a first real-life test environment,' Venus says. Weather conditions and road quality parameters are incorporated in the app, with the help of satellite data extracted from Sentinel and other providers. A scientific model on how these interrelated variables

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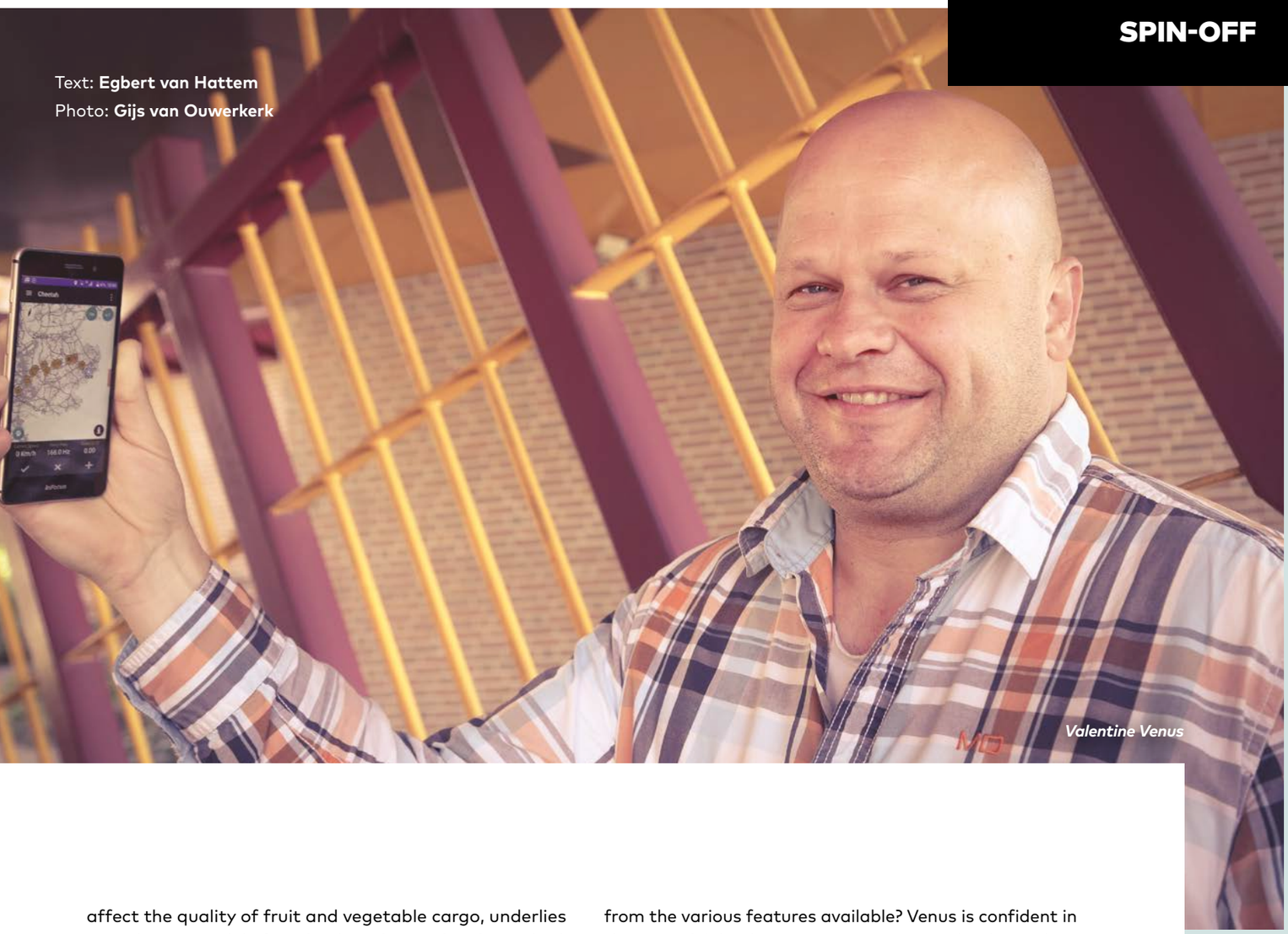
Sravanthi Murali (27) is finishing her first year of her Master's study at ITC, with a specialization in geoinformatics. When working as a software engineer in India, Murali determined she needed a change in career path. 'I began working for an NGO that dealt with waste management. The problem is we had a great lack of spatial data, which is

Text: **Egbert van Hattem**
Photo: **Gijs van Ouwerkerk**



Valentine Venus

affect the quality of fruit and vegetable cargo, underlies a prediction model of quality loss during the planned ride. Also motion sensor data and human-assistant sensing are available real-time for the truck driver who is, in many cases, himself the actual trader at the market he is heading for.

The users are able to update road quality changes and road blockage data, making this app a powerful crowdsourcing tool one day, possessing a vast potential for societal impact, Venus believes. After being excluded from the PC revolution, Africa is adopting smart telephone technology in a rapid pace. Paying one's petrol by smartphone is commonplace in Africa, as are mobile learning apps.

Social acceptance

'It is a really exciting phase we are in now!' Venus says. First of all, he is curious about how the truck drivers will adopt the app technology itself. How will they be able to benefit from the various features available? Venus is confident in this regard. 'The drivers are very motivated to bring their fruit and vegetables to the market as quickly and in as good quality as possible. Apart from the financial incentives they gain pride in doing so. Above that, they are used to mobile phone technology and are keen learners.'

Acceptance

The more unpredictable is the social acceptance of this new technology regarding public servants, central government and stakeholders, such as farmers/suppliers, colleagues and market competitors. Venus says: 'The tool empowers the truck drivers, allowing them to smartly circumvent road blocks, for example. The acceptance of the technology will depend on the way this subtle playing field will balance out. There is a double empowerment here, as the tool can store historical data, giving the users objective information to perhaps seek media attention if large-scale abuses occur.' ●

essential in order for us to determine where the waste comes from.'
Upon realizing the gap in this field, Murali made the decision to travel to the Netherlands and begin her studies at ITC. 'I've heard from multiple sources that it's the best in the world. The study is very new to me but the modules are extremely well planned, and I appreciate that they are quite application-oriented. What I'm studying here is exactly what I wanted to learn.'
'I intend to do my thesis in laser scanning to create an algorithm for geo-mapping.' While Murali plans to find work in Europe to increase her exposure, she promises to keep in touch with her NGO team at home. 'I will definitely contribute my expertise to the cause back home, and in the meantime I want to explore my job prospects here, or elsewhere in Europe.'

Text: **Michaela Nesvarova**
Photos: **Jellien Tigelaar & ITC Faculty**

SMARTseeds: Helping farmers in Indonesia

ITC INVOLVED IN A PROJECT TO HELP 100,000 FARMERS

'The ultimate goal of the SMARTseeds project is to improve income of at least 100,000 farmers in Indonesia,' ITC researcher Wietske Bijker describes a big international project that aims to provide information services for vegetable farmers.

ITC Faculty is one of the partners in the SMARTseeds project, which should deliver a mobile service that supports mainly small-scale chili, tomato and cucumber farmers in several provinces of Indonesia.

Satellite images

If everything goes as planned, the farmers will receive information via text messages and a mobile phone app. They will have access to daily and seasonal weather forecast, as well as agricultural advice, such as when and how much of fertilizer or pesticides should be applied to their fields. 'ITC's task is to ensure automated processing of satellite images,' explains Wietske Bijker, who is responsible for the project on behalf of ITC. 'In the end, we want to train the computer to automatically recognize crops – where they grow and, if possible, how well they are doing. That is a lot of work, because we need to combine a lot of different data from the new Sentinel satellites.'

Growing vegetable market

Another challenge lies in the project's focus: vegetable produce. 'We still need

Hariady Mantong (36) is following his dream by doing his Master's in Water Resources and Environmental Management at ITC. 'This has been my dream ever since I began my Bachelor studies in Jogjakarta, Indonesia,' says Mantong, a husband and father of two. 'I heard about ITC Faculty on my very first day at university. I want to be an expert in this field, so naturally I was searching for the best of the best.' That, he found, was the ITC Faculty in the Netherlands. 'For water management, this is truly the best place to study. In the Netherlands, their water management system, or Waterschap, is older than the government itself. That's why it is such a blessing to get to obtain this knowledge here.'

Learning about the management of surface and ground water resources is important for developing food security or disaster mitigation. Mantong specializes in hydrological modelling, which is an essential component in flood control. 'It was interesting for me to see the different mind-sets people from other countries have towards environmental

SMARTseeds is financed through Geodata for Agriculture and Water (G4AW), a Dutch programme aimed at improving food security in developing countries by using satellite data. The Netherlands Space Office (NSO) is executing this programme, commissioned by the Dutch Ministry of Foreign Affairs.

to establish how detailed information on vegetable produce we can and want to extract from satellite images, because previous research focused on other crops like rice or wheat,' says Bijker. 'The focus on chili, tomato and cucumber farmers is important, though, because vegetable market is growing in Indonesia. At the same time, many areas are affected by climate change, which means that traditional farming doesn't result in good produce anymore.'

The SMARTseeds service should, however, also help in this regard. One of the main project partners is EWINDO, company supplying climate adapted seeds. The weather and seasonal forecast in the service could therefore allow farmers to better decide which of the seed varieties to plant.

What do farmers need?

'Data on how much produce is grown and how well the crops are doing is especially interesting for people who buy the harvest, such as supermarkets. These parties could then pay for the information and consequently make the service cheaper for farmers,' continues Bijker. 'Local farmers are already involved in the development – our partners in Indonesia have organized sessions with them to find out what they need the most, which is why the resulting service will include primarily the short-term and long-term weather forecast, but also market prices and good agricultural practices advice.'

'Only about 30% of the local farmers have smartphones at the moment, which is why in the first version version information will be provided only by text messages,' clarifies Bijker. 'However, we expect more and more people to start using smartphones in the near future, which will allow us to reach them through an app. At first, though, we are involving only a small test group, who we will provide with information on seasonal weather forecast and soil. After three years one project partner will conduct another big survey among all the involved farmers to see if the service helped them. After all, the end goal is to increase their income by at least 10%. We expect that the most gain will come from reducing the farmers' costs, as they currently apply a lot of fertilizer and pesticides and spend money on irrigation, which may not always be needed.' ●

'Farmers receive text messages and will have access to daily and seasonal weather forecast'

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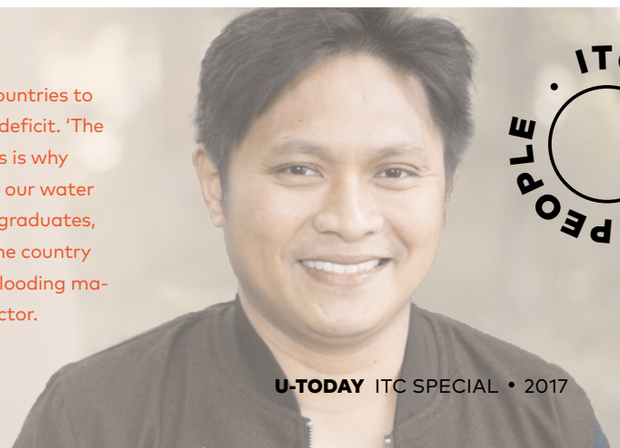
problems and resource management. I have classmates from Africa who are very conscious of the environment and saving water; however it is not the same way in Indonesia. We have so much water that we often do not stop to think about how vital it is to manage it properly.' But this abandon is a contributing factor to climate change, claims Mantong, which causes some countries to have surplus and some to have deficit. 'The result? Floods and draught. This is why we need to be very vigilant with our water management.' When Mantong graduates, he plans on returning to his home country of Indonesia, to find work as a flooding management consultant or contractor.



Text: **Esther Windt**
Photo: **Arjan Reef**

Home in a hotel

The ITC International Hotel is in the heart of the city. A colourful residence for four hundred students from more than forty countries. Let's look at the hotel that is also a home.

The hotel lobby: bright blue walls and lamps, purple, orange and green relax chairs, a permanently manned reception, a table with computers. Receptionist Marieke Engelbertink says that students from 42 countries live at the hotel right now. 'We facilitate the residents as much as possible, so that they can concentrate on their studies,' says Marieke. 'The rooms are cleaned weekly, there is free wifi, a study area and each floor has a communal kitchen.'

The hotel is fifteen stories high and boasts 398 single rooms. Almost every room is occupied. Sometimes the students stay for less than a year, but often they stay much longer. These aren't just students working on a Master's or PhD degree at ITC Faculty, foreign students from other faculties also live here.

Tranquillity abounds in the Globe, the communal study area. Goncalo Silva is from Portugal and is working diligently, together with a classmate and compatriot. He has only been in the Netherlands for a month-and-a-half and says he is reasonably happy at the hotel. 'It is quite expensive, but the rooms are good and I like the contact with the other residents on my floor. There are people from Mexico,

Luka Vukic (28), from Serbia, has graduated from ITC with a Master's degree in Natural Hazards Risk and Engineering. He completed his intensive eighteen-month program with writing his thesis on the value of drones in post-disaster rapid response. 'During my time at ITC I have learned to apply geo-information sciences and earth observation to the field of managing natural disasters,' says Vukic. 'What this means is we learn how to use satellite data in combination with other data to model and predict how a catastrophe would behave, for example flash floods, landslides, or earthquake.'
Vukic enrolled at ITC through Erasmus, from which he received a full scholarship. 'Back home we don't incorporate the modern technology we use here into our risk management processes, but it is incredibly useful and beneficial.'
Though being separated from the UT campus has given Vukic a slightly different student life than others enrolled at the university, he has nevertheless enjoyed his time spent living

'The rooms are good, the contact with residents is fun'

France, Turkey, Uganda. I like the international atmosphere. Sometimes we cook and eat together.' He does get a little homesick. He particularly misses the Portuguese climate and food. He finds the Dutch landscape charming and he is amazed by the fantastic infrastructure for cyclists.

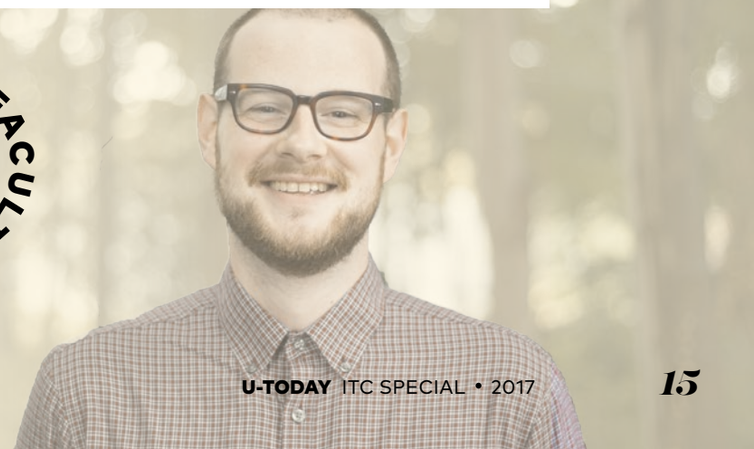
Faried Rahmany from Indonesia is doing some ironing in the laundry area. He's wearing flipflops and shorts and looks like he's feeling right at home. 'This is a pleasant hotel and you can easily walk everywhere.' He will stay for about eighteen months, to do his Master's degree. Thanks to the internet, he can stay in touch with his wife and child. 'It makes it possible for us to communicate properly and maybe they will even come to visit me, although that's very expensive.' In the short time he has been here, he has already made new friends, all from his home country. 'I see them as my new family, we cook and eat together. To be honest, the others cook and I eat, because I have never cooked in my life', jokes Faried.
Other compatriots also gravitate towards each other in this hotel. A group of Chinese students is sitting together, Portuguese students are studying together, there are two people from Bahrain in the elevator. The students confirm that it is nice to speak your own language and socialise with people from your own culture, but they all say that it is also really nice to hang out at the hotel with people from across the globe.

In the lobby there are five students from Ethiopia. They met at the hotel. They have all been here since the start of the academic year. Siefu says he likes everything about his stay in the Netherlands. 'Everyone is helpful and prepared to work together. Also, everything is organised incredibly well, which is different from the way things are run in Ethiopia.' The others nod in agreement. It is a coincidence that they are all sitting together, says the group. 'There are also people from China on my floor for instance, I like to integrate.' Siefu and two of his compatriots show their rooms on the eleventh floor. 'Look at this amazing view,' he laughs. His room is neat and tidy. It is a simple room with a desk, some chairs, a small television and a bathroom.

The smells from the kitchen give away its location. A spicy aroma unknown to Dutch noses greets you from afar. Are there any dirty pans or used plates lying around? No: everything is spick and span. No wonder, because the kitchen is cleaned every day for the students.
A real student residence 'deluxe'. ●

ITC FACULTY PEOPLE

with other internationals at the ITC hotel. 'I was previously exposed to an international environment through AISEC, but I had never lived with other nationalities before. I gained a lot of friends from all over.' Having finished his studies at the ITC, Vukic has decided to remain in the Netherlands in search of employment.



Text: **Marjolein Gosseling**
Photos: **Arjan Reef & ITC Faculty**

Capacity building in developing countries is one of the pillars of ITC. It's the third main focus of the management team, next to education and research. With ITC-knowledge, alumni can make a difference in their own country. Four alumni talk about their ambitions and dreams in their home country.

'One big family'

Lifelong friendships

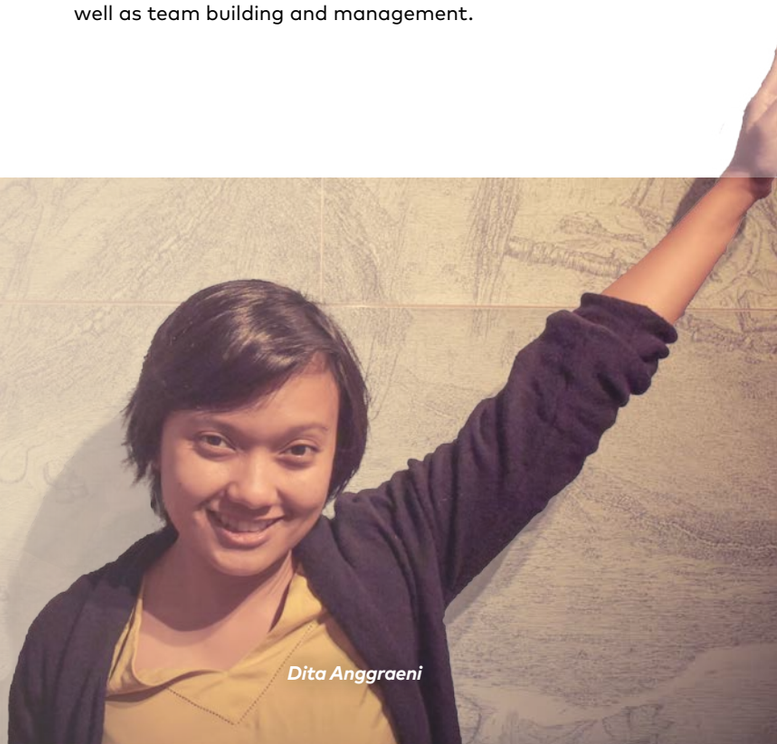
Marco Rusmini works as a consultant at Environmental Resources Management (ERM) in Italy. From 2007-2009, he studied GIS & Remote Sensing at ITC, where he also was the general secretary of the Student Association Board (SAB). He has fond memories of ITC, and in particular of activities related to SAB. 'Representing students at SAB taught me many valuable lessons. ITC involved us a lot in important matters, varying from university issues to problems concerning students' study or private life. The ITC board really listened to our points of view and let us be a vital part in the discussion and solution process,' says Rusmini. The lifelong friendships he made here are still very precious to him. He regularly keeps in touch with old study-mates, many of them also working in the field of GIS and remote sensing. For Rusmini, having ITC named on his CV resulted in receiving several invitations for job interviews. He clarifies: 'One of the interviewers told me that as I had studied at ITC, he didn't need to ask me anything technical, as my expertise would surpass his anyway. He just simply relied on my knowledge because I had studied at ITC.'

One of the projects Rusmini would like to start if he won a grant, is developing a d ata management system with a strong GIS component, linking ITC's expertise with the private sector.

'ITC opened up global opportunities for me'

Dita Anggraeni has been living in New York for five years, where she works for the UN Office for the Coordination of Humanitarian Affairs (OCHA) as an in-house graphic designer of OCHA pooled funds. Her responsibility is to visualize the specific needs of people living in developing countries, and to put relevant data about funding and humanitarian needs into maps and infographics for a better understanding of the situation. Quite a few ITC alumni work for OCHA as well, and she regularly works together with them in the field. Anggraeni studied Geo-Information Sciences at ITC from 2008 to 2010, and is thankful for the opportunity to study and learn so much. 'I remember seeing some Applied Earth Sciences lecturers starting a snowball fight outside. These professors are brilliant lecturers and professionals in their field, but they were also so much fun! It made me feel very lucky to study with them at ITC,' she describes. She explains that ITC has a high reputation as a specific institution that is focused on GIS and mapping: 'My degree and experiences at ITC are highly regarded and ITC has opened up global opportunities for me.' With her Indonesian roots and bachelor in Oceanography, her dream project would be to create a floating 'boat' school for Indonesian students and teach them about Indonesia's coastal system and marine life, as well as team building and management.

Marco Rusmini



Dita Anggraeni

Moreblessings Shoko

Chudamani Joshi

Still in touch with many alumni and lecturers

Moreblessings Shoko is an ambitious ITC alumna from Zimbabwe, and about to obtain her doctoral degree at the University of Cape Town's Geomatics Division. She recently won the UT Marina van Damme Award 2017. Shoko aims to strengthen the position of women living in rural areas of Zimbabwe by developing reusable sanitary pads that can be distributed by a drone-based distribution system. Despite the thousands of kilometers between her and ITC, she's always been a loyal reader of the ITC magazine. She also still keeps in touch with many alumni and lecturers she met when studying GIS at ITC in 2010. Enthusiastically, she tells us about her experiences at ITC: 'I cherish my time at ITC a lot and I loved the Dutch culture. I especially remember the food festivals that ITC organised – they were fantastic! Meeting so many people from different nationalities and living in a new environment was quite a culture shock for me at first, but the atmosphere was great. Many students became good friends, and we all felt like we were one big family. All of us were there by ourselves, and though we had different backgrounds, we were now facing the same situation, sharing new experiences and having similar study goals and career ambitions.' If Shoko ever wins another grant, she would buy drones and mapping technology to enhance her research and further strengthen the position of women in Zimbabwe.

'The very first stone of my career'

Chudamani Joshi was born in Nepal and works in Kathmandu as Special Advisor at the Embassy of Finland. He moved to the Netherlands in 1999 to undertake a PhD in Tropical Forest Ecosystems (Wageningen University) and study Remote Sensing and GIS at ITC. As President of the ITC Alumni Association Nepal, he is still connected to ITC. Joshi explains that ITC provided the very first stone of his career foundation. 'ITC helped me become a competitive professional with a relevant network and a strong resume. At a more personal level, I gained real world experience, satisfaction, social status, analytical skills and decision-making power,' he says. Now working in a truly diplomatic world, he bridges the gap between many countries and societies. In his home country, about 71% of household water supply is contaminated with E. coli. Joshi says: 'I would love to start a project that aims to reduce water related health hazards by constructing and maintaining sustainable water supplies for poor, isolated communities. The project would generate freely available remote sensing and participatory GIS data and maps for resource mapping. Finally, by introducing Dutch know-how and technology we could enhance the efficiency of water use and agricultural productivity'. ●

A whole new world opened for both the University of Twente and ITC as the faculty settled in Enschede in the 1970s. The domain of geo-information and earth observation meant a new perspective for the academic community in Enschede.

From Delft to Drienerlo

Text: **Rik Visschedijk**
Photos: **Rikkert Harink & ITC archive**

'There was no real overlap between ITC's and UT's respective fields of study at that time', says ITC archivist Homme Martinus. 'The working relationship between the two institutions was fairly limited, as the agricultural universities in Wageningen, Delft and Utrecht were more logical partners for ITC during the 1980s.' With the UT and ITC as fresh new neighbors, a new partnership was bound to be established.

The International Training Centre for Aerial Survey, or ITC for short, was founded in Delft in 1950 by former Prime Minister Schermerhorn. The building in Delft not only offered educational facilities, but also housing for foreign students. ITC Faculty continues to offer its own housing facilities to this day. Since its inception, the institute grew rapidly. In 1967, ITC's housing was even a frequent topic of discussion for the government.

To Enschede

In March of 1970, the Dutch cabinet decided to move ITC to Enschede in light of the proper distribution of government services. Its new location: the Twentec building on the Boulevard 1945. 'The ITC's employees, nearly two hundred of them, were introduced to Enschede right away,' says Martinus. 'On the train, they each got a slice of krentewegge, a traditional regional product. The THT (which would later become the UT) was willing to temporarily house the ITC students on its own campus while the ITC student accommodations were under construction.' Existing plans for student housing were fast tracked for those students. 'In total, 152 rooms were reserved in the residential pyramids being built along the Langenkampweg,' Martinus says. 'For the development of the new and final student housing facilities, the VU University Am-

ITC FACULTY PEOPLE

Appau Williams Miller, a Master student of Land Administration at ITC, has high aspirations for his future. 'Right now I am studying how to protect people's rights to use land, in order to ensure land stability and food security to eventually eradicate poverty,' explains Miller, the 26 year old student from Ghana. 'Once I graduate, I hope to get a

sterdam's plans for a residential tower were copied. This building was constructed on the corner of the Boulevard 1945 and C.F. Klaarstraat.'

New development

During the second half of the 1980s, ITC wanted to build a new workplace for itself. 'That was absolutely necessary,' says Martinus, who worked in the Twentec building himself at the time. 'The old building was rapidly becoming outdated. It barely had any insulation, for example. Energy costs were a major expense and employees were left in the cold during the winter.'

In 1987, Minister of Education Deetman put a stop to the plans for the new development. It was not until a new government was installed in 1990 that talks were reopened on new housing facilities for ITC. Martinus: 'In1992, the new cabinet finally approved the plans for the new development.'

Cooperation

The first explorations of the UT and ITC to cooperate effectively slowly started up in the 1970s. From 1971, a UT staff member held a seat on the ITC's Board of Governors (a type of supervisory board). Martinus: 'That was the case until 1998, when the ITC's administrative structure was being revised. Three years later, it was decided that ITC should remain an autonomous institution in the field of education and research, while the tasks of coordination and representation towards the Ministry were given to the UT.'

During the first decade of the new century, the cooperation between the UT and ITC continued to expand. ITC is embedded within the University of Twente and 1 January 2010 becomes an UT faculty sui generis (the only one of its kind). The merge of ITC within the University of Twente accelerated the collaboration in the shared research and educational domains, with activities being undertaken in for instance the fields of Smart Cities, Health and Security. Martinus: 'ITC's arrival on the campus can be seen as the – tentative – culmination of a long journey.' ●

PhD in real estate investment and finance. Ultimately I plan to combine my expertise in these two fields to help my country develop its land sector.'

Miller chose ITC Faculty after a friend and alumni of the institution recommended it to him. 'I realized as soon as I arrived that he was right about the high standard of education. We really have an excellent learning environment: as students we think for ourselves, we learn from each other, we assist one another. In our study we come from all over the world, so we learn from seeing everyone's different potential, lifestyles, and attitudes.'

A life of science is not enough to occupy Miller, who also wishes to try his hand at politics. 'I am currently the president of the ITC Study Association Board. In this committee I handle issues that arise and work towards creating events that connect students. I took this position because I have ambitions to one day become a politician.'

ITC

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  - Geoinformatics
  - Land Administration
  - Natural Hazards and Disaster Risk Reduction
  - Natural Resources Management
  - Urban Planning and Management
  - Water Resources and Environmental Management
  - Tailor made specialization
- Spatial Engineering (planned to start in 2018)

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