

ALUMNI MAGAZINE  
FACULTY OF GEO-INFORMATION SCIENCE  
AND EARTH OBSERVATION  
UNIVERSITY OF TWENTE

# ITC NEWS

## CYCLING IN RIO DE JANEIRO?



## PHD DEFENCE



## FBK GAMES



## GREETINGS FROM



MAPPING

Photogrammetry

Plant design

GNSS

LIDAR

Environment Visualisation

Laser Scanning

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Remote Sensing

Terrain Analysis

Mobile Mapping

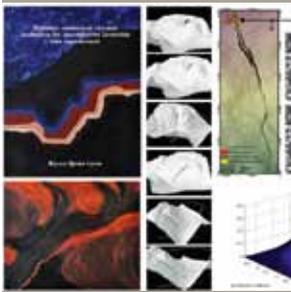
GIS

Geomatics

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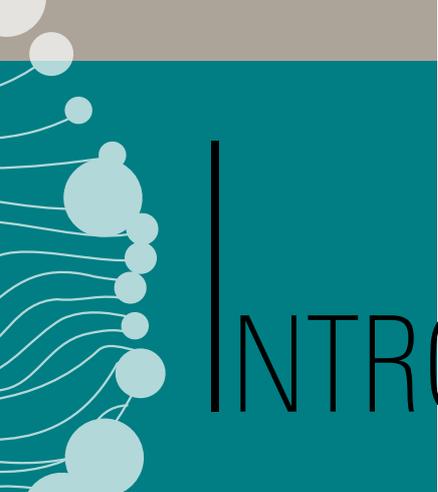
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Public bikes in Estação Arco Verde (photo M. Zuidgeest)



# INTRODUCTION

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## colofon

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do not necessarily reflect those of ITC.

ITC News travels the world, so while one reader may be enjoying the promise of spring, another may be wrapped up against the biting winter cold. Here in the Netherlands it's summer - although perhaps that's just a rumour, as the rain it raineth pretty much every day and the sun shows its face only spasmodically. Still, good news for the manufacturers of waterproof clothing as, if you turn to page 6, you will read that the Netherlands is the world's leading nation when it comes to cycling. Read further, and you will discover that, if all goes according to plan, cycling with its many physical and environmental benefits is set to play a serious role in transport planning policy in Rio de Janeiro.

Cycling is, of course, a mode of transport with zero emission but it is not the only one. Page 12 gives us an entertaining account of the UT/ITC relay team who ran their way into the record books. A remarkable achievement in terms of time, space and zero emission!

In life there's no escaping change, and in modern-day life there's no escaping rapid change. Naturally not all change is welcome – and that certainly applies to landslides and debris flows, which can wreak havoc in the lives of mountain peoples. It is therefore unsurprising that the May seminar on tools for quantitative landslide hazard and risk assessment attracted considerable international attention and participation. The article on pages 14 will tell you more, as well as serve as an introduction to the PhD defence covered on page 3.

Inevitably, along with change comes new terminology. What exactly is a hackathon? Is it animal, vegetable or mineral? Well, all is revealed on page 9, and such was the enthusiasm generated by this innovative event that registration for any similar happening in the future is likely to be fast and furious. So it's well worthwhile keeping your eyes open. But in the meantime we hope you can just sit back, relax and enjoy this latest, "summer" issue of *ITC News*.

Virtually yours,

**Janneke Kalf**  
*Managing Editor*

**Jorien Terlouw**  
*Editor*

# MAIN FEATURES

## PhD Defence: *Dynamic Numerical Run-Out Modeling for Quantitative Landslide Risk Assessment*

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**A**t 14:30 on Friday, 11 May 2012, Mr Byron Quan Luna defended his PhD research in the Waaier room at the University of Twente. The event was organized by ITC. The title of the dissertation was *Dynamic Numerical Run-Out Modeling for Quantitative Landslide Risk Assessment* and it was examined by a committee composed of Professor Tom Veldkamp and Professor Freek van der Meer from the University of Twente; Professor Michel Jaboyedoff from the University of Lausanne, Switzerland; Dr Jean-Philippe Malet from the University of Strasbourg, France; and Dr Farrokh Nadim from the Norwegian Geotechnical Institute, Norway.



Mr. Byron Quan Luna and his promotor professor Victor Jetten

The initial part of the research was conducted within the Marie Curie Research Training Network: Mountain Risk. Mr Quan Luna was an Early Stage Researcher in the Mountain Risk project, the main focus of which was to research and provide training in all aspects of mountain hazard and risk assessment and management. The intention of the network is to develop an advanced understanding of how mountain hydro-geomorphological processes behave, and to apply this understanding to living with hazards over the long term. The last part of the research was carried out at the International Centre of Geohazards in the Norwegian Geotechnical Institute, with involvement in the European-scale SafeLand project. In the course of the research, Mr Quan Luna was also involved as participant or lecturer in different topical workshops and intensive courses in various countries, such as Italy, Spain, Austria, Nicaragua, France, the Netherlands, Switzerland and Germany. He took part in the international LAR-AM (Landslide Risk Assessment and Mitigation) 2008 summer school in Ravello, Italy, and also acted as advisor during the writing of several master theses by ITC-UT students.

The supervision of the research was carried out by Professor Victor Jetten (promotor), Dr Cees van Westen (main supervisor) and Dr Theo van Asch (co-supervisor). The main objective of the research was to apply, improve and optimize numerical simulation models for developing landslide risk and hazard maps. The correct use of these models can benefit the public authorities when making decisions about communities faced with potential hazards. The main focus of the research was to evaluate the efficiency and reliability of the modelling simulation tools. Since there are various models for simulating mass flows and for identifying the intensity of hazardous phenomena, it is important to assess these models, perform parameterization, and reduce their uncertainties.

Landslides and debris flows are geomorphological events that may pose danger to different components of mountainous societies. This danger is the result not only of the process as such, but also of the interaction with human systems and their associated vulnerabilities. Understanding, forecasting and controlling the hazard associated with slope movements of this type is still an empirical task that requires a mix of qualitative and quantitative analyses. The development of numerical dynamic run-out models has made a dramatic change to the study of hazardous processes, as these models allow the simulation of possible future scenarios, including scenarios that have no historical evidence. Dynamic computer models have the potential to simulate geomorphological processes with an acceptable degree of accuracy. Once this has been achieved, a range of potential hazard scenarios can be analysed, and the results can be used to inform local authorities and the population accordingly, so that they may respond to these hazards and draft plans to reduce the associated

risks. For this reason, it is important to evaluate the reliability and consistency of these dynamic models that integrate the physical descriptions of the landslide process in a numerical scheme embedded in a geographical information system.

A variety of models exist for simulating and identifying the hazards presented by the different mass-flow phenomena. Dynamic run-out models are able to forecast the propagation of material after the initial failure and to delineate the zone where the elements-at-risk will suffer an impact with a certain level of intensity. The results of these models are an appropriate input for vulnerability and risk assessments. An important feature of using run-out models is the possibility to perform forward analyses and forecast changes in hazards. However, most of the work using these models is still based on the calibration of parameters, doing a back calculation of past events. Given the number of unknown parameters and the fact that most of the rheological parameters cannot be measured in the laboratory or field, it is very difficult to parameterize the run-out models. For this reason, the application of run-out models is used mostly for back analysis of past events, and very few studies attempt to achieve forward modelling with the available run-out models. A reason for this is the substantial degree of uncertainty that still characterizes the definition of the run-out model parameters.

This research has contributed to a better understanding of the use of run-out modelling of debris flows, and provides a number of new avenues for the incorporation of uncertainty in this type of analysis in order to make a better estimation of potential losses. The results can be applied in cost-benefit analysis for the design of risk reduction measures ■



On 11 May 2012, ITC PhD student Byron Quan Luna successfully defended his PhD thesis

# RESEARCH NEWS

## IAMG Student Chapter Seminar: Why should Earth Scientists Care about Statistics?

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**The IAMG student** chapter at ITC acts as a gateway between the International Association for Mathematical Geosciences (IAMG) and ITC students. The aim of IAMG is to promote international cooperation in the application and use of mathematics in geological research and technology. On 19 April 2012, the IAMG student chapter at ITC organized a seminar entitled “Why should Earth Scientists Care about Statistics?”.

Guest speaker at the seminar was Professor John H. Schuenemeyer. Professor Schuenemeyer, the IAMG Distinguished Lecturer for 2012, is president of Southwest Statistical Consulting, LLC, and professor emeritus of statistics, geology and geography, University of Delaware. We hosted about 40 staff members and graduate students. The purpose of the seminar was to gain greater understanding

of the application of statistics in the earth sciences.

The seminar was opened by Professor Alfred Stein, seminar chair and IAMG student chapter advisor. In his presentation, Professor Schuenemeyer described how earth scientists are confronted with many challenges within the Earth’s surface, in the oceans and in the atmosphere.

We learned how statistics can help earth scientists to understand complex geological processes. Below is the abstract of Professor Schuenemeyer’s address.

After the seminar, we expressed our appreciation of all the efforts that Xiaogang (Marshall) Ma, the previous president of the IAMG student chapter, had made in setting up this chapter at ITC ■

### ABSTRACT OF PROFESSOR SCHUENEMEYER’S ADDRESS

Earth scientists are confronted with many challenges. Phenomena of interest are often found deep within the Earth’s surface, in oceans, or in the atmosphere. Collecting data is often costly, time-consuming, and hampered by limited access. Geological events occur at irregular, often widely spaced intervals. Decisions made on the basis of studies in the earth sciences can have significant long-term consequences. An understanding of the data used in decision making is critical. Statistics is about data. Exploratory data analysis provides insight into data quality, variability and structure. Modern graphical procedures enhance our understanding of multifaceted datasets. Constructing models provides a basis for understanding complex geological processes and for making inferences. Characterizing and understanding uncertainty associated with estimates is critical. Analogues and expert judgment frequently play an important role in analysis and modelling. Examples of both the proper use and the misuse of statistics will be presented.



Professor Schuenemeyer, the IAMG Distinguished Lecturer for 2012

# P PROJECT NEWS

## Cycling in Rio de Janeiro?

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**How can we** develop the transport systems in our ever busier cities in such a way that accessibility is improved while at the same time congestion and stress on the environment are reduced? This is a key question that researchers in ITC's PGM department are grappling with and for which no easy answers can be found. Could cycling be an answer?

Cycling can provide a number of clear benefits: it is efficient, particularly for short to medium distances; it is a healthy activity; it provides door-to-door transport; it is cheap (also in terms of infrastructure costs), and therefore has the potential to contribute to the mobility of the poorer segments of society. And most importantly, it is the most environmentally friendly transport mode, with zero emission.

Sustainable transport finally became recognized as a key theme in the United Nations Conference on Sustainable Development that was held last June in Rio de Janeiro, Brazil. The Rio+20 conference was the follow-up to the famous first Earth Summit conference in 1992. The contribution of the Dutch government to the conference was aimed at showing best practices and inspiring examples that could lead to a more sustainable global economy. One of these practices is cycling. As the world's leading cycling nation, the Netherlands has a lot of experience in the inclusion of cycling in planning and policy making and the development of cycling as a prime mode of urban transport.

Asked by the Dutch Cycling Embassy to develop a showcase to demonstrate the impact of current and future cycling-related policy on accessibility and emissions, the PGM department, together with the Goudappel Groep, carried out a study for the Netherlands Ministry of Environment and Infrastructure and the environment department in the Rio municipality. The results were presented at Rio+20 by State Secretary Joop Atsma.



Cycling Copacabana (photo: M. Brussel)

In the showcase, future bicycle-related scenarios for the Rio transport system are developed and evaluated as to their effects on accessibility and climate. The underlying model, which includes a multimodal transport model, is based on data on travel behaviour from an earlier study and projected census data. Two metrics are developed to evaluate possible interventions in the Rio transport system: one related to the carbon benefits of cycling (the so-called climate value of cycling (CVoC)), and one accessibility indicator. Different scenarios related to ongoing and possible policy initiatives concerning cycling are involved, and these were discussed during a workshop with local organizations held in April.

### Expanding the Bicycle Network

By 2004, about 140 km of bicycle infrastructure had been constructed in Rio. Considering the vast extent of the city, the bicycle network is still very small and runs mostly alongside the beaches, benefitting richer neighbourhoods in the southern part of Rio. Currently there are plans for an additional 150 km of bicycle lanes.

### The Public Bicycle System

The Rio Public Bicycle System is relatively new (2008) and is still limited in size. Initially, the programme was composed of approximately 60 stations with 600 bikes, which are distributed mainly throughout the South (East) Zone of the city. In the coming period up to 2016, marking the Olympic Games, the public bicycle system will be expanded to various other areas in the city.

### Job Relocation

This intervention focuses on the relocation of employment in Rio de Janeiro. The idea behind such a policy is to distribute employment and services more homogeneously over the city. This spatial-planning-oriented intervention promotes the improvement of local accessibility and the reduction of trip distances, making them potentially more attractive by bicycle.

### Metric 1: Climate Value of Cycling as a Measure of Carbon Mitigation Potential

Ironically, assessing the carbon impact of cycling is complicated, because cycling has an intrinsic zero-emission value. Attributing

direct carbon benefits is therefore difficult. However, cycling avoids CO<sub>2</sub> emissions: if people do not cycle, they probably use another, potentially emitting mode. Therefore, the CVoC metric is based on the prediction of the most likely alternative (substitution) mode for each bicycle trip and the calculation of the additional CO<sub>2</sub> emissions for that trip by the alternative mode.

### Metric 2: Accessibility as a Measure of Social Inclusion

Accessibility essentially measures the end benefit of the integrated transportation and land use system: how many destinations (generally jobs but also shops, schools, entertainment and recreation facilities) can be accessed in a given time (or at a given cost) using a given mode of transport. Increasing accessibility (bringing people, opportunities and goods within easy reach of one another) has always been the fundamental role of cities. We use an accessibility metric that considers spatially and temporally dispersed opportunities, which gives planners the opportunity to use it as a policy design tool.

### Results

Of the three implemented interventions, the one that performed best was the public bicycle scheme intervention, resulting in a 21% increase in cycling trips, and a 6.3% increase in the CVoC, with job accessibility levels having clearly increased as well. Interestingly, the cycling infrastructure intervention does not lead to a notable increase in cycling trips at city scale (only 0.1%). The scale of the mainly local improvements in cycling infrastructure is too small for that, and seems to produce mostly local effects. To improve cycling levels, more effort is needed concerning integration with public transport hubs, particularly in areas where many potential cyclists reside. In terms of accessibility, one of the results (see figure below) fosters the idea of competition between cycling and public transport on the basis of a so-called potential accessibility measure. This measure evaluates the number of employment opportunities by either cycling or public transport but discounts these opportunities on the basis of travel time (further destinations get lower scores). The map shows areas in blue with values lower than 100, indicating that the location is more accessible by bike than by public transport. Areas that score 100 are equally accessible, whereas areas with values higher than 100 are more accessible by public transport than by bike.

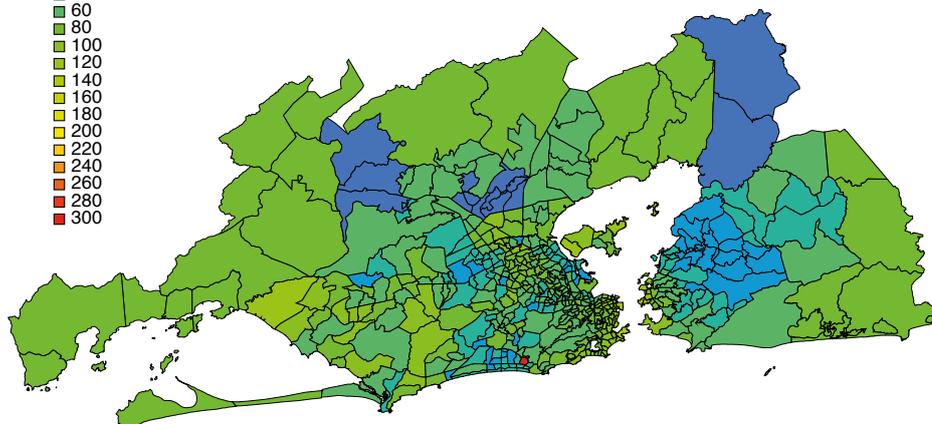


Public bikes in  
Estação Arco Verde  
(photo: M. Zuidgeest)

## Legend

### Potential accessibility

Ratio of jobs reachable by PT vs Bike



Levels of potential accessibility: public transport versus bicycle

The best results are achieved when the key interventions are combined, leading to an almost 50% increase in cycling levels to 6% of modal split. This result vouches for the concept of cycling-inclusive planning, which is built on the premise that different mutually aligned interventions in the land use transport system as a whole provide for the best results.

In our view, a key strategy to enable Rio de Janeiro to push forward in their cycling agenda is to concentrate on the integration of cycling and public transport through a combination of physical and non-physical interventions – and to show stamina! In doing so, we believe it is possible to raise the share of cycling from the current 4% to 10% in the coming 20 years. That would be a major achievement! ■

# Sensors, Empowerment, Accountability in Tanzania (SEMA)

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**The research programme** “Sensors, Empowerment, Accountability in Tanzania (SEMA)” is funded by the Netherlands Organisation for Scientific Research under the WOTRO-Global Science for Development Programme. The research focuses on how ordinary citizens in Tanzania can directly exact accountability from water and public health providers with the human sensor web. The programme entails collaboration with stakeholders from government, community based organisations, and non-governmental organisations especially during the “deploy and learn” cycles of the SEMA prototype software.

## SEMA Kick-Off Workshop

The SEMA research programme officially commenced in May with several activities in Dar es Salaam. On 7 and 8 May, the official opening workshop was held at COSTECH. During this workshop, the core team of junior and senior researchers met for the first time to examine the SEMA research concepts, identify criteria for selecting fieldwork sites, and discuss the working approach and collaboration modes. Local experts and stakeholders had been invited to this workshop to provide the research team with critical comments and a review of their plans.



Group picture

The SEMA research programme is jointly implemented by the University of Dar es Salaam (Tanzania) and the University Twente (The Netherlands). The Principle Investigators are Dr. Juma Hemed Lungo, College of Information and Communication Technologies of University of Dar es Salaam (TZ) and Prof. Dr. Yola Georgiadou, Faculty of Geo-information Science and Earth Observation (ITC), University Twente (NL).



The SEMA team also hosted a session at the IST-Africa 2012 conference on 10 May. This session focused on enhancing the relationship between citizens and government agencies through mobile communications and web technology.

SEMA closed its opening week with a hackathon on 12 and 13 May at COSTECH. Thirty young programmers and ICT entrepreneurs came together to develop practical web and mobile solutions for the challenges faced in the SEMA research programme.

#### First SEMA Hackathon

***Better tools, better facilities, a happier crowd. Water, health and technology experts work on solutions to empower citizens.***

The first SEMA hackathon was held on 12 and 13 May 2012 in Dar es Salaam, Tanzania, at the Innovation Space of TANZICT at COSTECH. In this hackathon, we wanted to work on innovative solutions for connecting citizens to information systems in health and water. We built on existing software concerning social media, crowd sourcing, human sensors, and the like. The event lasted until Sunday afternoon, when prizes were awarded to the best hacks.

The hackathon started early in the morning, with a steady stream of young programmers arriving. Professor Yola Georgiadou, SEMA research leader from the University of Twente (UT), officially opened the event. Rob Lemmens, the hack organizer from the UT, then explained the event to the audience. The introduction ended by displaying hack prizes to crave for: a stack of highly desirable ICT and coding books. It was fascinating to see how quickly the original group of registered hackers almost doubled in size as soon as it became clear what the event was all about. They SMSed

their friends, encouraging them to join the hackathon, and within the hour the Innovation Space had turned into a hive of bustling coding activity, with 22 hackers (including three women) and several interested parties who came to observe and wonder.

Mark de Blois from Upande Ltd gave an introduction to the group about ODK and social media, as well as possible tools to mine online content for geocoded dissemination. Next up was Mark Iliffe, talking about Taarifa in Uganda and Map Tandale in Dar es Salaam. His presentation came to the group via Skype. After the presentations, teams were formed, challenges chosen, and an afternoon of frantic and dedicated coding began. Some programmers were so absorbed in their tasks that they forgot to eat. Late afternoon, just before dinner was served, the groups presented their harvests of the day to one another. Lots of promising stuff was shown.

On day 2, the hackers returned to the "drawing board" at COSTECH – second round of the hackathon. Most were already there at 7:00 am! Local Mlimani TV interviewed all the hackers, as well as the SEMA research leaders Juma Lungo and Yola. At the end of the day the jury came into play. The magnificent efforts of all the coders had to be evaluated on merit in terms of the SEMA research concepts, innovative approaches and practical implementation.

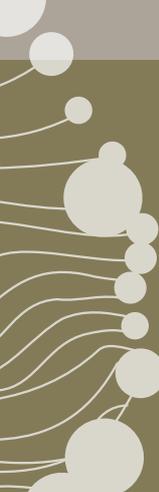
The Hack Jury consisted of Dr Juma Hemed Lungo (lecturer, College of Information & Communication Technologies, University of Dar es Salaam), Dr Rob Lemmens (assistant professor of applied computer science, ITC, University of Twente) and Mr Eric Mutta (Apps4Africa

2011 Climate Challenge winner and local entrepreneur with 15 years' experience in producing software). Eric first gave an inspiring talk: "Programming gives you control over the machine!" Criteria: match with challenge, innovation, scalability by others.

The challenge winners were:

- 1st Place: Challenge number 4 team, "Geospatial interoperability" – Rosina Pashal, Mihayo Mathayo, Allan Oware Maungu (Upande) and Nick Thomson
- 2nd Place: Challenge number 1 team, "Mining profiles" – Hubiri Burton, Charles Bundu, Miltone Urassa and Sam Samson
- 3rd Place: Challenge number 6 team, "Finding Geonames" – Deogratus David, Khalid Salim, Albert Rulonona and Lulu Khamis

This first SEMA hackathon was a terrific experience, thanks to the dedicated hacker crowd, the brilliant environment of the TANZICT Innovation Space, and the inspiring leadership and organization of Rob Lemmens ■



# VISITS

## UNESCO-IHE Visit

**Cooperation between the UNESCO-IHE Institute for Water Education and ITC** dates back several decades. Both institutes started out as independent international postgraduate institutes in the second half of the 20th century, but lately they have developed along different paths. IHE has joined the UNESCO family, whereas ITC has become a faculty of the University of Twente. Nevertheless, both have retained their original mission: the education of students from all around the world at postgraduate level.

Society and social behaviour are becoming more and more important in water-related issues. IHE and ITC complement each other and, as they operate in a very special niche where other institutions in the Netherlands do not, it is obvious that they should work together.

The ITC Department of Water Resources (WRS), always one of the major cooperating partners of IHE, visited the Delft institute in 2010. On 11 April 2012, IHE returned the visit. The guest delegation consisted of seven colleagues: Professor A. Szöllősi-Nagy, the rector, Professor D. Solomatine (Hydroinformatics), Dr L. Alfonso (Hydroinformatics), Dr L. Hayde (Land and Water Development), Dr J. van der Kwast (Hydrology), Dr S. Maskey (Hydrology) and Kun Yan (Hydroinformatics). ITC was represented by 16 colleagues from WRS and the Earth Systems Analysis and Natural Resources departments, led by Professor T. Veldkamp, the dean, and Professor Z. Su, head of WRS.

First, we gave short presentations on our latest major activities that could be interesting from the point of view of cooperation. This was a very good way of trigger-

ing ideas, which were then discussed in a brainstorming session in the afternoon.

We identified several possibilities for coordinated activities, including actions related to the World Water Assessment Programme (for example, we could organize a summer school together). We short-listed topics of scientific interest in agricultural water management, in transboundary river basins and in climate change adaptation (we are unable to list them all here owing to lack of space). However, perhaps an underlying generic aspect should be mentioned. In all water-related fields, the observation and gauging network is declining, while the models describing the phenomena are increasingly data-hungry. A paradigm change is needed in modelling, where the point-like, temporally continuous *in situ* measurements are increasingly replaced by spatially explicit data provided by earth observation.

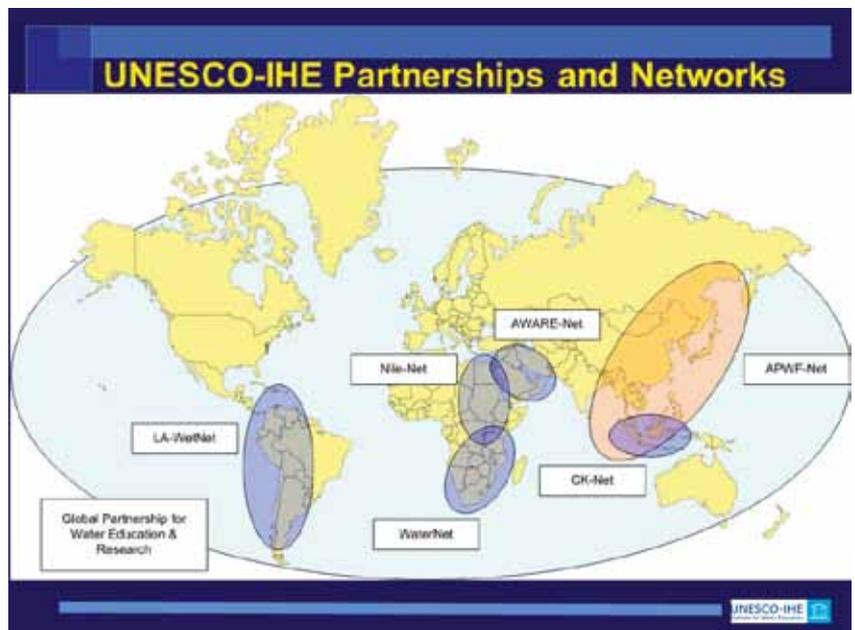
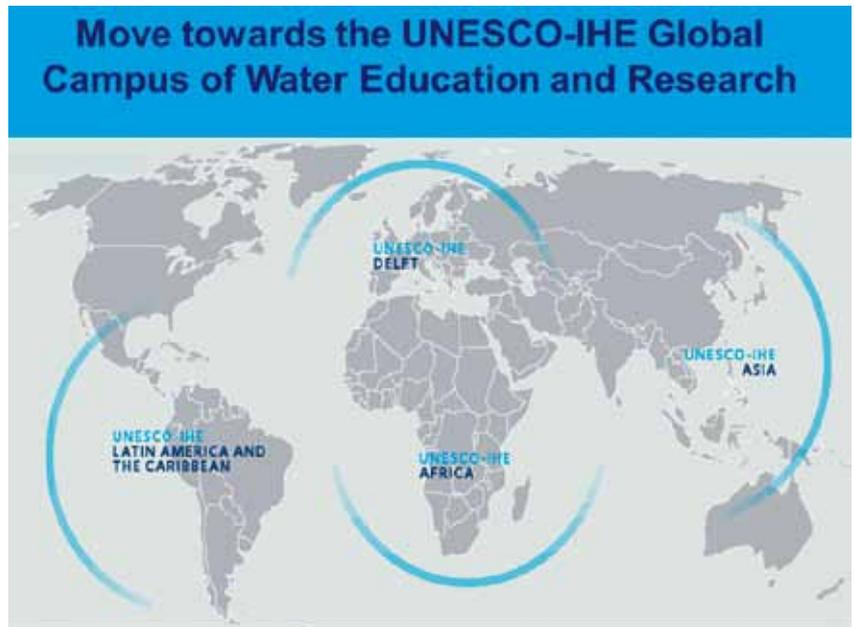
We have long been involved in joint MSc and PhD research and the exchange of lecturers – practical joint efforts that we intend to develop further. It seems there is the need and the will on both sides to further improve cooperation in order to

increase our chances of success in today's stormy economic circumstances.

In the ITC auditorium, Professor Szöllősi-Nagy gave a concluding presentation entitled "Global changes and challenges concerning water: Where do we go in research? Are we teaching the right stuff?". He gave an overview of the current global perspective on water resources, attempted to identify likely future challenges, and also outlined potential opportunities for solutions, as seen from the particular vantage point of international academic institutions such as UNESCO-IHE and ITC.

Given the projected demands for water and the likely impact of climate variability and change, the present water use practices are clearly not sustainable. After identifying the technical and social challenges that need to be addressed to establish sustainable water development and management practices for the future, he discussed the role of assessments and measurements, both *in situ* and remote, along with the opportunities offered by hydroinformatics. He argued that the design methodologies developed under the hypothesis of station-

Professor Szöllősi-Nagy gave a concluding presentation entitled "Global changes and challenges concerning water: Where do we go in research? Are we teaching the right stuff?"



any hydrological processes need to be revisited and updated. He pointed out that the re-examination of some of the structural measures, such as the need for more water storage, for more intensive hydro-power development and for further development of inland navigation, is a timely task. These measures pose new challenges but also offer new opportunities. Solutions are not obvious and we have to answer several important questions on our way to finding them: Are we really dealing with the most important issues? What is actually the main driver that will determine how water will be managed two generations from now? What are the likely scenarios? How effective is international cooperation? Is water an ethical issue or simply a matter of resource management? Isn't water just a matter of quick technical fixes through applying more technology? Is water a source of conflict or of cooperation? Are we doing the right stuff in water research and education?

We hope that the cooperation of ITC and UNESCO-IHE will bring us closer to answering at least a few of Professor Szöllősi-Nagy's questions ■



# ANNOUNCEMENTS

## FBK Games: UT/ITC Relay Team Take Third Place

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**On Sunday, 27 May 2012**, a UT relay team came third in the FBK Company Mile relay event. This relay is organized annually during the International FBK Games in the Fanny Blankers-Koen Stadium in Hengelo. Under the watchful eye of many thousands of spectators, the “Men In Black” from Faculty ITC ran a time of 4 min. 14.23 sec. in the 4x400 metres – a feat that claimed a brilliant 3rd place.

Joris Timmermans, the baby of the quartet, had to set the ball rolling, and he called on his experience in the 2011 edition to gain a good position. In the initial mêlée of experienced runners, who were quick off the blocks and away, and inexperienced runners, who were quick off the blocks and faded, he was left marking time at the back. Only after 200 metres in 34 sec. could he escape the crush and make headway, and in second position and 66 sec. – at a reasonable distance behind the leading runner from Siemens – he passed the baton on to the grand old man of the team. Roelof Schoppers quickly found the runner from Saxion drawing alongside but valiantly held him off on the outside round the first bend. Alas, it turned out that the much younger runner could also run much faster, and a gap soon opened up. At a rapid pace, with a slight, permissible falling off in the second part, Roelof covered the circuit in 66 sec. too. The Saxion team was gaining rapidly on Siemens, and had increased its lead on the UT team to about 50 metres when Roelof passed the baton to Mark van der Meijde. Mark is a keen skater and quite accustomed to doing the odd lap or two, which was evident in this race as well. He ran the 400 metres without flinching in 66 sec. too. It seemed then that the die was cast; just as in previous years Saxion was running to victory unthreatened and the gap between Siemens and the UT seemed unbridgeable for the UT team. But that didn't stop the last runner from trying. In a last-ditch attempt, Wan Bakx went all-out with a time of 27 sec. at the midway point. The gap with Siemens was certainly narrowing but they too had kept the fastest runner till last. Finally, with an excellent split time of approximately 56 sec., Wan finished the relay for the UT team in 3rd place.

After the slight disappointment of last year, this was a terrific come-back and the other companies now know that the UT team is a force to be reckoned with. The runners and reserves immediately made plans for 2013, because this result has served only to whet their appetite. What's more, they think that with a little more “high tech and human touch” they'll be able to represent the UT even better next year – for example by using nano-technology to improve the running gear. Of course the running will still be down to the runners themselves but, when it comes to technology, every little helps! ■

Photos can be found on the following site  
[http://fbkgames.nl/fotogallerijen/gallerij/FBK\\_Games\\_2012/](http://fbkgames.nl/fotogallerijen/gallerij/FBK_Games_2012/)

The victory podium,  
with the UT team in 3rd place  
(in the front, from left to right:  
Joris Timmermans and Wan Bakx;  
at the back from left to right:  
Mark van der Meijde and Roelof Schoppers)



#### BACKGROUND INFORMATION

The participating teams are all employees of the companies that support this terrific athletics event via Business Club 83 (in any event this applies to the UT team). The UT has been a keen supporter of the Games for years but until now has never managed to achieve a place on the podium in the company relay. In fact, it had never even taken part until last year. In 2011 the UT was approached to form a relay team. Taking a roundabout route, this request ended up with the running group of Faculty ITC (Run4Fun), and six runners went into training. Unfortunately, partly owing to a trio of injuries, the UT team had to be content with a place in the rear. That was sufficient reason to prepare for 2012 in deadly earnest. At an early stage, six potential runners were selected to begin training, and were also instructed to avoid injury at all costs. Accordingly Simon Engelberts, Roelof Schoppers, Nick Hamm, Joris Timmermans, Mark van der Meijde and Wan Bakx tuned their training schedules to 27 May and demonstrated their form in the company clinics. In the last weeks before the contest, the final team selection was made, with preference given to a mix of the runners who had missed out in 2011 owing to injury (Roelof Schoppers, Mark van der Meijde and Wan Bakx) and the youngest, potentially fastest, runner (Joris Timmermans). Nick Hamm went along as reserve, mental coach, photographer and videographer.





# E EVENTS

## Seminar: Tools for Quantitative Landslide Hazard and Risk Assessment

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**On the occasion** of the PhD defence of Byron Quan Luna, the Department of Earth Systems Analysis of Faculty ITC of the University of Twente organized the seminar Tools for Quantitative Landslide Hazard and Risk Assessment. The seminar was held on Friday, 11 May 2012, and many international guests and speakers participated. Five different presentations related to the topic were given, with the focus on the use and state of the art of geo-information tools for the analysis and quantification of landslide risk

With the advancements made, the current geo-information tools have become essential for assessing the different components embracing a landslide hazard and vulnerability and risk assessment. Landslides are complex phenomena that are influenced by many external (e.g. rainfall, groundwater levels and topography) and intrinsic (e.g. geotechnical properties) factors in both their initiation and run-out processes. The forecasting and reduction of the hazard associated with slope movements of this type is a task that requires a mix of qualitative and quantitative analyses. Geospatial tools can be combined with methods for collecting and processing geospatial data and for using these data in quantitative applications.

Geospatial tools also allow quantitative analyses to be performed at several spatial and temporal scales, according to the objective of the hazard assessment. In the case of attempting to forecast the spatial

and temporal occurrence and the intensity of such slope movements, a host of different methods have been proposed in the past for characterizing and analysing quantitatively the hazard in a particular area. Some of these methods were discussed in detail at the seminar.

Different approaches and tools were presented that are leading to the development of new technologies used in modelling the landslide hazard at local, regional and national scales, with a focus on physically-based approaches. Special attention was given to the application and implementation of geospatial tools that allow the application of concepts for spatial data modelling, for information processing, and for analysing and disseminating geospatial data.

The seminar was arranged by Dr Cees van Westen (ITC-UT), who opened the proceedings by giving a brief summary of the topics to be presented and by introducing

the invited speakers. The first presentation, entitled "Landslide hazard and risk assessment at global and national scales", was given by Dr Farrokh Nadim from the International Centre for Geohazards (ICG) / Norwegian Geotechnical Institute (NGI). Dr Nadim presented the work carried out at NGI on the topic of natural hazards and landslide assessment, focusing on the susceptibility analysis performed at global scale entitled "Global landslide and avalanche hotspots". The work was carried out based on global datasets relating to climate, lithology, earthquake activity and topography. The NGI model output was a landslide and avalanche hazard index, which was globally scaled into nine levels. The model results were calibrated and validated in selected areas where good data on landslide events existed. The results from the landslide and avalanche hazard model, together with global population data, were then used as input for the risk assessment.

The second presentation, entitled "Use of image correlation techniques for landslide hazard assessment", was given by Dr Jean Philippe Malet from the Ecole et Observatoire des Sciences de la Terre (EOST), Institut de Physique du Globe de Strasbourg (IPGS), Strasbourg, France. The presentation focused on a methodology to monitor the displacement of continuously active landslides from ground-based optical images analysed with a normalized image correlation technique. The performance of the method was evaluated on a series of images acquired of the Super-Sauze landslide (Southern French Alps) over different periods of time. Dr Malet showed how the heterogeneous displacement field of a landslide can be characterized in time and space with this methodology.

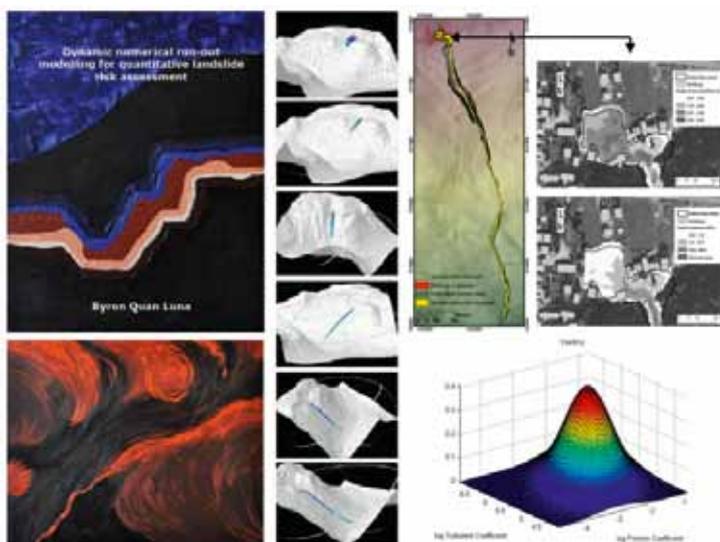
Andre Stumpf, a doctoral candidate from the University of Strasbourg, France, and ITC-UT (where he spent two years working under the supervision of Dr Norman Kerle), gave the third presentation. The topic was "Image-based mapping of landslide surface fissures" and he discussed his work on developing a semi-automatic image processing chain to efficiently extract fissure maps from very high resolution aerial images. This methodology was applied at the Super-Sauze landslide in the Southern French Alps, using surface fractures as a proxy for important indicators of geo-mechanical processes and for mapping and monitoring landslides.

The fourth presentation was given by Dr Simone Frigerio from CNR-IRPI, Italy, and entitled "Web-based multi-hazard risk assessment platform". Dr Frigerio presented the work carried out within the Multi-RISK platform. MultiRISK is multi-module platform that combines the modelling of hazards and the exposure of elements at risk in mountain areas, including a validation step and a final web visualization. The platform functions were shown in a live demo at the seminar.

The last speaker of the seminar was Mr Haydar Hussin. His presentation topic was "Quantitative risk assessment of hydro-meteorological hazards in Europe: incorporating future change". Mr Hussin obtained his MSc at ITC-UT and now is carrying out his PhD studies at CNR-IRPI in Perugia, Italy, with ITC-UT as a second institution. He is involved in the Marie Curie Initial Training Network called CHANGES, which is coordinated by ITC-UT. Mr Hussin presented a broad overview of the different components and uncertainties involved in a quantitative landslide risk assessment, which will be part of his future research.

The seminar was highly successful and interesting discussions took place during the event. Finally, the seminar was brought to a close by Dr Cees van Westen and the participants were invited to the PhD defence that was to take place later that day

Byron Quan Luna,  
Department of Earth Systems Analysis of  
Faculty ITC of the University of Twente



Dynamic numerical run-out modelling for quantitative landslide risk management

# Greetings from... Pakistan

NAME: Mark van  
der Meijde

**JOB DESCRIPTION:** Research and education in geophysics in the Department of Earth Systems Analysis and the Applied Earth Sciences programme.

**ACTIVITIES:** Working on refresher course on local amplification of earthquake signals in mountainous regions; starting up joint research projects and discussing initiatives for joint educational activities with the National Centre of Excellence in Geology at Peshawar University; hosting an ITC alumni reception; giving an invited presentation at Pakistan Earth Sciences 2012.



The refresher course Modern Tools for the Evaluation of Seismic Induced Ground Shaking and Associated Secondary Hazards for Earthquake Vulnerability was held from 11 to 22 June 2012 in Nathiagali, Pakistan. The course logistics and contents were organized by the National Centre of Excellence in Geology, and the course was executed together with ITC and the Asian Disaster Preparedness Center. Twenty participants from Bangladesh, Nepal, Sri Lanka and Pakistan took part in the course.



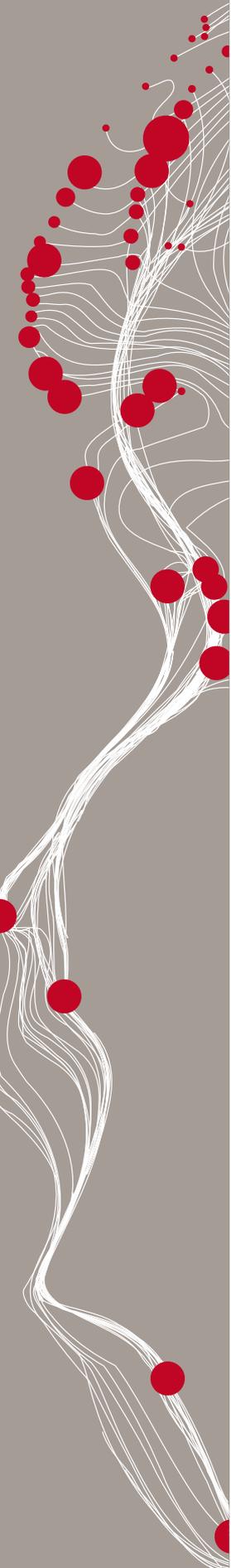
The opening of the course was attended by the Pakistan NFP officer, Ms Nabeela Ahmad, while at course closure the certificates were presented by the Dutch ambassador, Mr H. Gajus Scheltema. At the weekend, an excursion was made to Balakot, a city devastated in the 2005 earthquake and currently still at risk.



We have also embarked on joint research regarding two initiatives: a joint PhD research and a project on real-time monitoring of landslides. We have installed a system to monitor an active creeping landslide in Kashmir. This system consists of an automated SLR camera in a stationary set-up, with weather-proof housing and power backup. Images with a 10 cm/pixel resolution are acquired three times a day. After receiving the images at ITC, the detection of subpixel motion is to be performed to monitor creep throughout the year.



During the course, we organized an ITC alumni meeting in Islamabad with the support of the Dutch embassy. It was a very pleasant well-attended meeting, with over 40 alumni. There were alumni from the 80's, as well as people who had returned to Pakistan only four weeks earlier. The Dutch ambassador was there to welcome all alumni.



# SPACE FOR GLOBAL DEVELOPMENT

The faculty of Geo-Information Science and Earth Observation (ITC) of the University of Twente is one of the world's foremost education and research establishments in the field of geo-information science and earth observation with such a wide range of disciplines and activities in this field.

## **CAREER PERSPECTIVES**

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. This dynamic setting offers attractive career perspectives, enabling qualified personnel to put their skills and expertise to excellent use.

## **DEGREE, DIPLOMA AND CERTIFICATE PROGRAMMES**

Over the years, ITC has developed a wide selection of courses in its degree, diploma and certificate programmes in geo-information science and earth observation. These courses are offered in the Netherlands, online and abroad by ITC itself or by ITC in collaboration with reputable qualified educational organizations.

## **DEGREE COURSES IN GEO-INFORMATION SCIENCE AND EARTH OBSERVATION FOR:**

- Applied Earth Sciences
- Geoinformatics
- Environmental Modelling and Management
- Land Administration
- Natural Resources Management
- Urban Planning and Management
- Water Resources and Environmental Management

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