ISSUE 2016-4

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

ITC NEWS

TOP RATED PROGRAMME

SPECIAL SECTIONS
- THE LAST MILE
- ENTREPRENEURS

GEONAREM

STARS

SHORT COURSE

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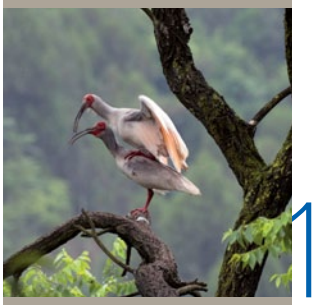

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cover

Content

GeoNAREM, is a multi-national initiative which was co-founded by four MSc students during their studiesat ITC. A major selling point of GeoNAREM is the diverse background of team members, each offering a wealth of expertise and experience in fields of application including Forestry, Agriculture, Geography, Environment Management, Geology and, of course, GIS and Remote Sensing.

INTRODUCTION

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ITC NEWS is published quarterly by ITC, Enschede, the Netherlands.

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ISSN
1389 9368

How to introduce *ITC News* 2016-4? No easy task, given the following pages cover such a wide range of subjects over a large period of time. Perhaps thoughts along the lines of adventures done, highlights celebrated, and more adventures in the making will offer an opening – and these are adventures often seen through the lens of personal endeavours. Faithful readers of the magazine might have noticed that in 2016 only one issue was published. The strength of the magazine is content written by the scientists, alumni and staff of the ITC community. At the same time this is the weakness in this case as well. As all members of the ITC community are busy living their adventures in their domains writing an article is sometimes too much of a burden.

This edition of the ITC New magazine will look deeper into *"the Last Mile"* for the large ITC projects. How are they focusing their capacity building activities on the requirements in the market, and bringing technology and the solutions to the ultimate user community (page 3). Next to the Last Mile this issues gives space to ITC entrepreneurs. Several graduates have started their own business with the knowledge they achieved while studying at ITC (page 9). As we always encourage our students to follow their dreams they were more than happy to share their realized dreams with us in this issue.

For those who would love to start their own business in this domain but do not have the knowledge yet, take a look at page 15 for a distance education course which will run again next year. In February ITC's master programme Geo-information Science & Earth Observation was given the quality seal 'top rated programme' for the third time in a row. Next to the honor of receiving this seal several alumni/staff also received awards for their excellence in their domain. This time an European award (page 24), a Chinese award (page 23) were granted to members of our ITC community.

Again, you will find a diverse magazine which keeps you informed about all developments at ITC. Maybe you have an interesting story to tell about *your* experiences after your graduation. As we keep you abreast of ITC's life, please inform us about your present life and maybe you will read your own life story in the next issue of ITC news magazine.

Virtually yours, Jorien Terlouw
Editor

Special Section

The Last Mile

One of the spearheads in ITC vision is that 'ITC will focus on the 'last mile' in order to embed Earth Observation firmly in society'. What this boils down to is that training institutions must be able to cover "the last mile", focusing their capacity building activities on requirements in the market, and bringing technology and the solutions it has to offer to the ultimate user community (at all relevant levels). GEOCAP, STARS and Its4land, currently large capacity development projects of ITC, have shared their Last Mile with you in the coming articles.

Geothermal Energy Indonesia–Netherlands

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In January 2014, ITC started a 4-year capacity development project in geothermal energy Indonesia–Netherlands (GEOCAP). GEOCAP is a public-private partnership funded by the Netherlands Ministry of Foreign affairs to assist the Indonesian Planning Agency (BAPPENAS) to fast track geothermal uptake and capacity building. ITC has the honour of being the coordinator of the project. The project consortium consists of partners from Indonesia and the Netherlands; the University of Gadjah Mada (UGM), the University of Indonesia (UI), the Institute of Technology in Bandung (ITB), IF technology, DNVGL, Utrecht University, TU-Delft and TNO. ITC also works together with the Indonesian Geothermal Association (INAGA) in the project to reach the geothermal network in Indonesia.

Indonesia has a population of approximately 250 million people and in 2015 had a GDP of US$861 billion. According to ADB economic forecasts for Southeast Asian countries, Indonesia has a GDP growth of 5.2% in 2016 and this puts Indonesia on the list of biggest economies in the area. This economic growth is followed by the increase in energy demand. It is predicted that Indonesia's energy demand will grow 30-fold in 2050. In 2016, the government of Indonesia adopted the Fast-Track program designed to rapidly develop 10,000 MW of generation capacity utilizing the relatively inexpensive coal resources which are abundant in the country. In 2010, a presidential decree was issued stipulating that for the additional 10,000 MW, 40% must be contributed from geothermal energy. During the 4th Indonesia International Geothermal Convention and Exhibition 2016 in Jakarta, the vice president of Indonesia, Jusuf Kalla, reaffirmed that geothermal needs to have a priority in energy development.

The total potential of geothermal energy in Indonesia is 29 gigawatts and at the moment Indonesia has explored 5% of its total potential. One of the obstacles in geothermal energy develop-

The project consortium consists of partners from Indonesia and the Netherlands

ment in Indonesia is the lack of skilled and trained personnel to explore, produce and exploit the resource. GEOCAP therefore focuses on increasing the capacity of various stakeholders in geothermal activities in Indonesia. The project recognizes that in order to have a significant impact in geothermal energy development, building capacity is not only essential regarding the human aspects but also governance, legislation, investment climate etc. Geothermal energy exploitation comes with concerns regarding protected forest areas as most of the suitable locations for geothermal energy are located in these areas. Regarding this issue, in 2014 the government of Indonesia issued a new geothermal law to improve business development in the geothermal sector for the benefit for people's welfare.

By working with the three Indonesian universities, GEOCAP can closely align with current developments in education. The project also consults the decision makers in the geothermal energy fields in Indonesia through the advisory board which is chaired by BAPPENAS. GEOCAP has several intimately linked components:

- Education and training programme
- Research programme
- Database programme
- Exploration of the use of low and medium enthalpy resources

ITC as the project coordinator takes the main role in building the network in Indonesia to ensure that the project results meet the current needs, and also to develop the sustainability strategy for the project. In the summer of 2016, GEOCAP PhD candidates will start their research and will contribute to the work packages – and their research period will outlive the project. Currently, GEOCAP is also exploring a cooperation with the training center of the Indonesian Ministry of Energy and Mineral Resources to reach more universities in Indonesia. ■

Geothermal energy exploitation comes with concerns regarding protected forest areas as most of the suitable locations for geothermal energy are located in these areas

Regulary meetings between the different partners are organized

For more information on the project please visit our website www.geocap.nl

http://www.worldbank.org/en/country/indonesia

http://www.adb.org/countries/indonesia/economy

Bali clean energy forum http://bceforum.org

http://prokum.esdm.go.id/perpres/2010/Perpres%204%202010.pdf

Ways to Use High Resolution Remote Sensing Technology to Improve Small-Scale Agriculture

Chiel Stroeven m.h.stroeven@utwente.nl

The STARS project has been looking for ways to use high resolution remote sensing technology to improve small-scale agriculture in Sub-Saharan Africa and South Asia. With support from the Bill & Melinda Gates Foundation, the project aims to develop information products that help improve decision-making around agricultural food production systems in these areas.

The ITC Faculty of the University of Twente in the Netherlands led a consortium of some of the world's best teams in agricultural remote sensing over a project period of 26 months. The consortium tested a number of hypotheses about the feasibility of agro-information products and assessed which types of information are most beneficial to stakeholders.

The consortium was made up of an international group of research institutes that further included:

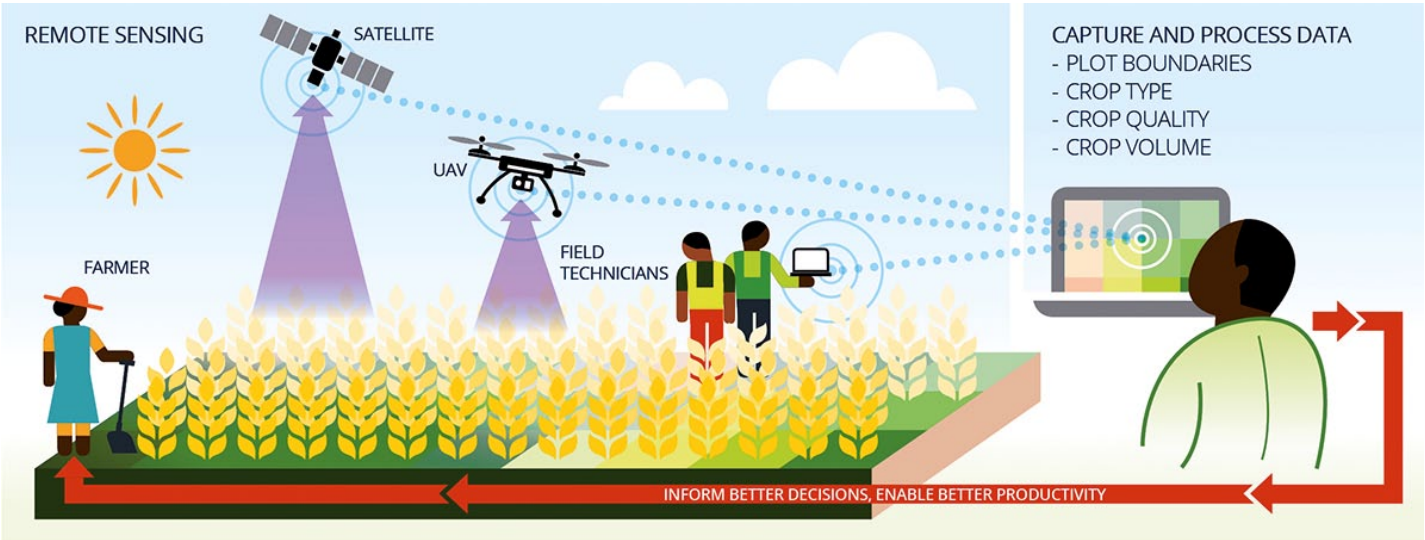
- CSIRO/Australia,
- ICRISAT/Mali, operating in Mali and Nigeria,
- University of Maryland/USA, operating in Tanzania and Uganda, and
- CIMMYT/Bangladesh, operating in Bangladesh and Mexico.

The latter three teams conducted regional use case experiments, and involved many local partners in that effort.

In West Africa, our activities were aimed at providing a sustainable, subscription-based rural land tenure information service, supported by very high-resolution satellite imagery. It became clear that due to the low volume of rural land transactions, the best way forward is to bundle such a service with other agronomic advisory services. STARS results were sufficiently compelling to trigger the emergence of a public-private partnership (PPP) joint-venture on digital agriculture, involving EO industry (for data), academia and NGOs (for knowledge) and input suppliers, insurers, agro-processors etc. (for services).

In East Africa, tools have been developed to support nation-wide Agriculture Monitoring for Food Security in Tanzania, which is now also emerging in Uganda. One of the main tools is a monthly national food security bulletin enabling the Tanzanian Ministry to make informed decisions. Several drafts were produced for internal evaluation by the National Food Security Division (NFSD) of the Ministry of Agriculture. This reporting mechanism is now gaining a foothold within the Ministry and we are confident that with the impact of the reports and a small continued effort by the STARS team next year, the Ministry will be able to sustain the work and that the reports will become a regular component in their decision-making processes.

The goal of our team in South Asia was to achieve a sustainable intensification of crop production in the southern delta of Bangladesh, through irrigation advisory systems in conjunction with integrated services. This has led to the development of a prototype of a field-specific irrigation scheduling smartphone app (Program for Advanced Numerical Irrigation, also known as PANI) that takes into account salinity and potential contribution of the water table to crop growth. The app informs farmers and irriga-



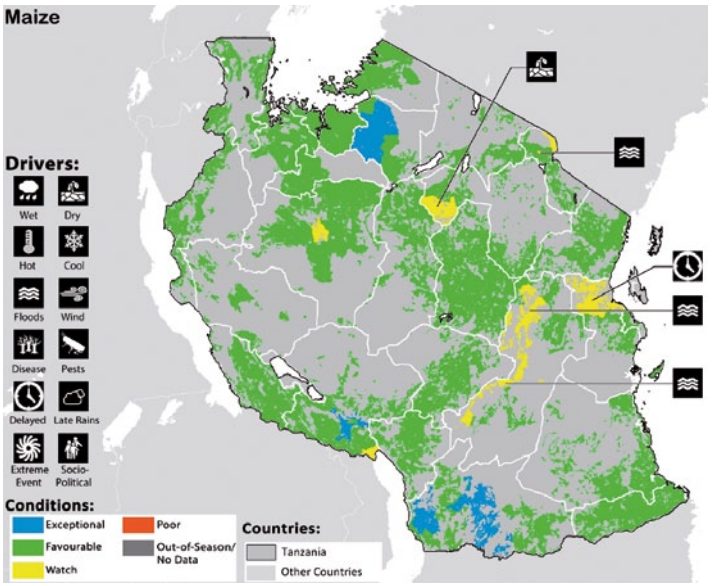
tion service providers on a weekly basis whether a field needs to be irrigated. Similar to the West African use case, a PPP along with bundling of services (credit, telecom, solar energy supplier for irrigation, etc.) will be the key strategy to promote PANI as a sustainable social business solution.

Besides these regional activities, STARS produced a number of information products to be made available to the general public. These global public goods are:

- A Landscaping Report. The STARS Landscaping Study developed guidance on how remote sensing can help to build more effective systems to support agricultural development and poverty alleviation. The study reviewed the systems context, reviewed recent advances in remote sensing and geo-spatial technologies, and identified ten areas of opportunity for remote sensing.
- A collection of image workflow and analysis algorithms that make it possible to work with remote sensing images for smallholder monitoring and support, and
- A collection of crop spectral and textural profiles, attributed with rich field data, that aims to support follow-up studies of crop (type/growth)
- A Knowledge Portal (KP) on the use of remote sensing in applications supporting smallholder farming. The KP is that part of the STARS website where general know-how as well as our project results are made available to the public, with the aim of establishing a reliable resource for the student of this emerging field. We will publish the global goods listed above in addition to other reports and papers, instruction videos and data sets.

STARS follow-up work continues on several fronts, of which the following are examples:

- Continued development of the irrigation scheduling app in Bangladesh;
- Engagement with Nigerian agro-service aggregator Babban Gona, to see to which extent they can benefit from STARS image workflow and its outcomes;
- A small continued effort to sustain the monthly national food security bulletin in Tanzania;
- Enriching the Knowledge Portal with the ambition of making it a first port of call for anyone wishing to learn more about the use of remote sensing technology in smallholder farming applications.



Program for Advanced Numerical Irrigation, PANI

A prototype of a field-specific irrigation scheduling smartphone app is developed

For more information please check:

Web: www.stars-project.org
Twitter: https://twitter.com/STARSprojectorg
Facebook: https://www.facebook.com/stars.project.org/
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via contact@stars-project.org

Going the Last Mile with 'Its4land'

Rohan Bennett r.m.bennett@utwente.nl

In land administration, the 'last mile' is often the longest and hardest to complete. Complex systems for creating information about people, land, and tenure flows can work rather well in places where capacity and capital are plentiful. However, creating systems that go the extra mile to deliver accessibility and availability, and ultimately tenure security, to the poorest and most marginalized in a community, is far more difficult. Accordingly, the 'last mile' is often forgotten, ignored, or simply put aside as 'too hard'.

In sub Saharan African countries, the 'last mile' for land administration looms large. The percentage of recorded land tenures can be as low as 3%. In Ethiopia, the majority of the population are rural dwellers (80M people): only 25% are likely to have some form of land record – and far less are spatially mapped. In Kenya, almost 10M pastoralists do not have a means for demonstrating legitimate land uses and holdings. Whilst Rwanda managed to recently map and record its 13M land parcels in around 4 years, several million records remain uncollected by smallholders. Moreover, crucial updates relating to land transactions are not always being recorded into official systems.

Its4land is a 4M EU research and innovation action funded under the European Commission's Horizon2020 programme that seeks to expedite sub Saharan Africa's land administration last mile. The central aim is to create seven new tools for making land rights mapping faster, cheaper, easier, and more responsible. Four tools build upon recent geospatial technology advances including UAVs, automatic feature extraction, cloud services,

Its4land is a 4M EU research and innovation action funded under the European Commission's Horizon2020 programme

We utilize our well-established local, national, and international partnership networks to reinforce strategic collaboration between the EU and East Africa

and smart sketchmaps. The other three focus on creating novel approaches for needs assessment, governance, and business opportunities.

The project kicked off in February 2016 and runs until 2020. It is coordinated by ITC and brings together 8 partners (University of Twente (ITC), KU Leuven, WWU Munster, INES Ruhengeri, Technical University of Kenya, Bahir Dar University, Hansa Luftbild, and ESRI Rwanda) from across 6 countries (Netherlands, Rwanda, Belgium, Kenya, Germany, Ethiopia) and 2 continents (Africa and Europe). The consortium is multi-sectorial, multi-national, and multidisciplinary: ITC brings its geospatial and administration expertize to the table. In addition, we utilize our well-established local, national, and international partnership networks to reinforce strategic collaboration between the EU and East Africa. Importantly, our program will incorporate gender sensitive analysis and design, use living labs thinking, and is embedded into local communities with localized pilots and demonstrations.

Its4land closely aligns with the 'last mile' thinking embedded in ITC's new Vision2020 strategy. In essence, for ITC, the last mile is about creating technology solutions that respond to, and reach, end-user communities. Our project's work packages, deliverables, communications, dissemination, and valorization are all tailored to respond to the demands of a diverse range of groups. These include:
1. communities, local NGOs, and governments in Eastern Africa;
2. international investors, donors, and organizations;
3. the geospatial technology sector;
4. emerging not-for-profit innovators; and
5. the research community. Each group is embedded into the project's lifespan, and hopefully beyond, through collaborative activities in the needs assessment, piloting and prototyping, advisory board membership, and valorization panels.

Its4land sees ICT as part of the solution for the 'last mile' in land administration. Whilst the work is in essence a research project, the hope is that the overarching impact will be the dissemination and scaled utilization of the suite of technologies that ultimately improves livelihoods, land governance and the delivery of sustainable development. ■

For more information of Its4Land

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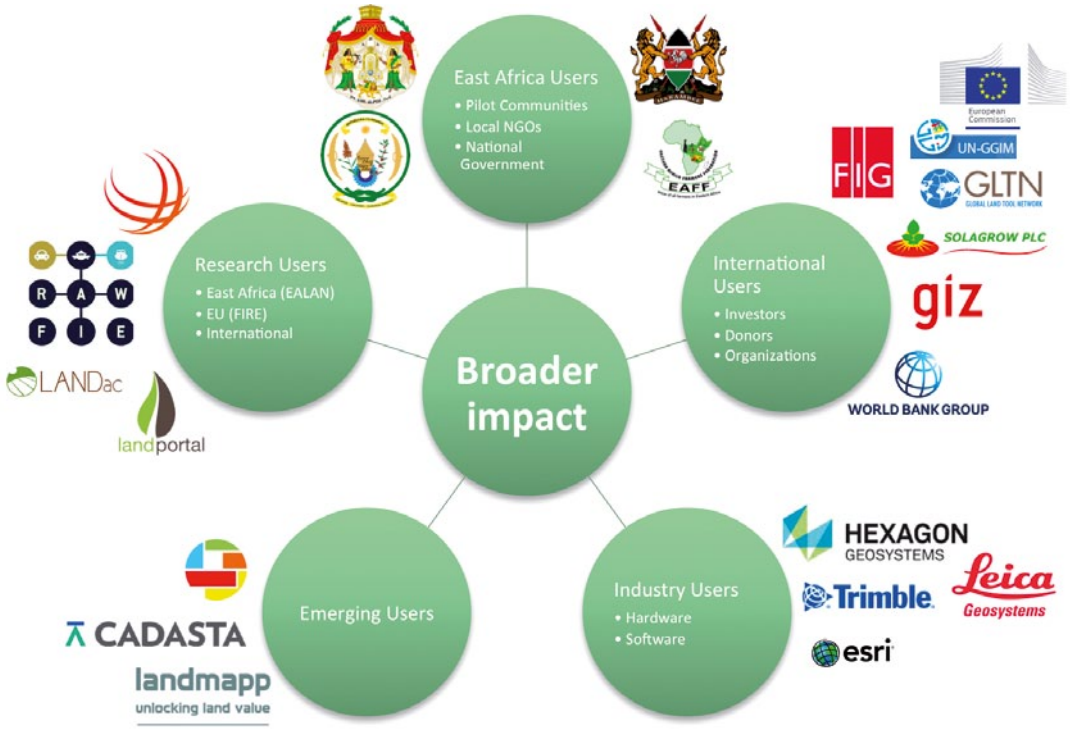
Francesco Nex (left) and Rohan Bennett (right) with Twin DT-18s from Delair-Tech



Special Section

Entrepreneurs

In the strategic vision of ITC (ITC 2020: More Space for Global Development) it is mentioned that "ITC considers its alumni to be it most important "product". They are our proud ambassadors and preferred partners in many projects. ITC will continue to consult and access its alumni network to achieve its mission and its goals."
The strategic vision also states that "entrepreneurship and innovation will be specifically targeted in our new capacity development activities and education programs" and that "ITC wants to develop its entrepreneurial core value, and intends to engage with the private sector to take the role of gateway organization. In this issues several ITC entrepreneurs will introduce themselves to the ITC community. Feel free to contact the entrepreneurs personally if you are interested in their story!

A Long Journey to Map Together a Better World

Javier Carranza Tresoldi Javier.carranza@geocensos.com

I still remember that March morning when I nostalgically left Enschede after completion of my MSc degree. I experienced many difficult things afterwards, but would never realize until now how the long the road ahead actually was. One of the visions I cherish the most from the Dutch experience, was the growing importance of the sociotechnical advances in the geo-spatial and geo-sciences disciplines. With this vision in my mind and together with other geo-geeks from Chile, Colombia and Guatemala I managed to start up GeoCensos, a social enterprise project to support the adequate use of geo-information in all kinds of organizations, especially at National Statistics Offices.

When we started we were just a bunch of geo-enthusiasts posting online geo-tech news from our desktop computers at home. Nowadays we can count over 60 members working in eight countries, having developed together more than 27 geo apps over the course of five national census processes and advocating for the good use of open geo data within a United Nations-sponsored organization: the Global Partnership for Sustainable Development Data.

GeoCensos

The road was not easy; just after graduation I briefly lived in Chile as a research assistant and survived professionally in Argentina, but it was not until I traveled to Colombia for a short consultancy that suddenly the magic began to happen for GeoCensos, eight years ago:

- My group and I wrote 647 papers, among articles, blogs and posts for 12 newspapers and media in the region, reporting on geotechnologies and geodata in several studies from 2010 to 2016.
- In small groups we contributed as back office to support Earthquake disaster information needs in Guatemala in 2012 for CONRED, National Coordination Agency for Natural Disasters.
- We organized a self-funded Road Show called GeoCensos Mesoamerica RS in 7 cities in 5 Mesoamerican countries for evangelization with geo data tools for universities, NGOs, Government and business chambers.

- We provided sponsorship and logistics to the Space Apps Challenge allied with the NASA Aerospatial Agency in 2013 in Bogotá, Panama City, Santa Marta, and Valencia, Venezuela and in San Salvador, El Salvador in 2014.
- We represented the Latin American civil society at the International Open Data Conference in Ottawa in June 2015, participated at the SoTM United States in New York in July 2015 and participated at the 8th meeting of the Statistical Conference of the America / ECLAC in November of 2015 in Quito.
- Organized Mapps Hackathon I and II in Bogota, Guatemala City, Medellin, Panama City, Quito, Santa Marta, San Salvador, Soacha and Neiva between 2013 and 2014.
- We joined the eDiplomacy US State Dept program presenting a GeoData speed geek at several Techcamp events in San Salvador, Bogotá and Cali in Colombia.
- Portrayed in July 25 updated results from the Stats Up project and benchmarked other Openstreetmap evangelization experiences at State of the Map US Conference in Seattle . Also, we demonstrated that project within the Global Partnership for Sustainable Development Data workshops run in Kenya and Tanzania Nairobi and Dar es Salam in 2016 to portray collaboration on census data from civil society and academia.
- Signed the Joint Declaration on Harnessing the Data Revolution for Climate Resilience of cities along with 20 countries, six cities, Google and the World Bank.
- Just recently, we participated as part of the civil sector in the the high level seminar on the 2020 round of censuses and the 2030 Agenda with the Montevideo consensus in November of 2016 in Panama.

As the universal athlete and inspirator Muhammad Ali once said: "Wars of nations are fought to change maps. But wars of poverty are fought to map change". This quote inspires us every day to keep on walking the road ahead and together mapping a better world. ■

GeoCensos
STATS·UP
MAPPING SUSTAINABLE DEVELOPMENT
@geocensos

For more information about our projects or interested in our work please contact Javier Carranza Tresoldi (javier.carranza@geocensos.com) or check our website http://www.geocensos.com/

> "Wars of nations are fought to change maps. But wars of poverty are fought to map change"
>
> *Muhammad Ali*

Geodata Consultans Limited

Rwehangira Stephen Pancras steven@geodatatz.com

The company was founded by Charles B. Buberwa and Stephen P. Rwehangira. Charles Buberwa completed his MSc degree in Geomatics at the University of Applied Sciences of Karlsruhe, Germany. At ITC in the Netherlands, he specialized in digital photogrammetry and remote sensing – in addition to overall quality management of Geo-information provision organizations, which he specialized in during his second semester at Karlsruhe.
Stephen P. Rwehangira completed his MSc in Cartography Visualization at ITC the Netherlands and later studied for a Postgraduate Diploma at University of Applied Science (TFH) Berlin in Germany where he specialized in GIS.
He has served for more than twenty years as a lecturer at the Ardhi University, specialized in the application of GIS in various fields.

GeoData Consultants Limited is a consultancy agency in Geomatics Engineering, Information and Communication Technology (ICT) and Entrepreneurship Development; we offer (among other services) the following:

- Geographic Information System (GIS),
- Remotely sensed data processing (RS),
- Urban Information Management,
- Digital Mapping,
- Management Information System (MIS)
- Database design and development,
- System and Software development,
- Website design and development,
- GIS, Remote Sensing Training.
- Sales and technical support of GIS based equipment
- Geodata also focuses on providing a comprehensive approach for specialized and high quality services aimed at enabling local communities both in rural and urban areas to effectively assess opportunities and participate profitably in utilization of local resources.
- Geodata facilitates the availability and use of reliable IT equipment for the Mapping Geographic Information System (GIS).

Our Mission

To offer reliable, accurate and timely spatial data / information with state-of-the-technology IT-related products, with qualified, motivated and competent staff.

Our Vision

Provision of professional services and products by experienced, responsible and committed staff in Geospatial sciences and Entrepreneurship development with the aim of accelerating poverty eradication efforts and hastening sustainable development.

Our Focus and Goals

GeoData Consultants Limited is a for-profit company whose activities and products are customer-oriented. Our focus and goals are aimed at contributing to sustainable land use, natural resources and environmental management by providing services and products using the latest technologies.

Our Experience In Consultancy

GeoData Consultants limited has worked with a number of organizations in providing services in different specialized areas. We have worked with the Ministry of Natural Resources and Tourism, WaterAid Tanzania, Concern Worldwide, SNV – Netherlands Development Organization and Ingenieria Sin Fronteras (ISF) of Spain in mapping the Improved Community Waterpoints, in the context of which a geospatial database containing spatial and non-spatial data information has been developed that is still being used by the organizations. GeoData has also worked with United Nations Children's Fund (UNICEF) in the School Mapping Project with the main aim of preparing maps showing the geographical location of schools, accessibility, status (number of students, teachers, and books) as well as the school service level.

GeoData has been supplying and supporting GIS-based equipment and software to different organizations including supplying Juno ST GPS sets to the National Bureau of Statistics, Concern Worldwide, MTL consulting company and TPDF.
We are currently developing a geospatial data gateway for Tanzania: a tool for disseminating digital spatial data through the Internet. The client for this project is GeoData Consultants Limited. The main aim of this project is to provide digital-spatial data over the internet, with the fastest and most reliable technology.

In our 'entrepreneurship wing', we are currently providing training to farmers in Nigerian LGAs on how to increase value chains for their crops. With this training and hands-on projects we are able to identify famers on their exact location, with their farms and their attributes. This way, GIS is applied in this entrepreneurship wing. ■

GEODATA
CONSULTANTS LIMITED
GIS, ICT & ENTREPRENEURSHIP SERVICE PROVIDER

Check www.geodatatz.com for more information.

Applying GIS- and Remote Sensing-Based Solutions in Solving Human Problems

GeoNAREM info@geonarem.org

GeoNAREM, which stands for Geo-information for Natural Resources and Environmental Management is a multi-national initiative which was co-founded by four MSc students during their studies in the Natural Resources Management domain from 2014 to 2016 at the Faculty of Geo-Information and Earth Observation, ITC-University of Twente. Conceived in the Netherlands, GeoNAREM is in various stages of establishing itself in the respective countries of the team members, namely **Ghana**, **Kenya**, **Tanzania**, **Papua New Guinea**, and most recently, **Rwanda**.

A major selling point of GeoNAREM is the diverse background of team members, each offering a wealth of expertise and experience in fields of application including Forestry, Agriculture, Geography, Environment Management, Geology and, of course, GIS and Remote Sensing.

The main aim of GeoNAREM is to apply GIS- and Remote sensing-based solutions in solving human problems. We hope to bridge the gap between development of spatial tools and on-the-ground application to solve real-life problems.

In addition to donor-funded projects in Tanzania, we are providing technical support to various organizations in Ghana and Kenya. We have already contributed to achieving outputs of projects on ecosystem conservation, resource management, and disaster response mapping. Our team members continue to be active in various levels of multi-stakeholder decision and policy formulation through their engagement with research and academic institutes, civil society organisations, state agencies, and the private sector.

A key hurdle arising from our set-up and establishment in several locations is the need to collaborate and synchronize our work while keeping in touch on a near-real-time basis. To address this, we apply smart remote, collaboration and modern communication tools such as social media, cloud-based computing and networked planning.

In each of these countries, GeoNAREM is working towards integrating remote sensing and GIS technology and natural resource management to find smart solutions for sustainable use of the natural resources for a better livelihood.

GeoNAREM is in its emergent stage, with promising potential and a positive outlook of the future. For the coming years, we

envisage an increased role and importance in national (and eventually global) problem solving. We will achieve this through strategic institutional partnerships as well as design and execution of relevant, innovative solutions… and of course, the hard work of a strong, talented team. We are look forward to working and collaborating on projects and programs with emerging and existing organizations. We strongly believe that our kind of expertise will be very critical to address current and emerging problems of climate change within Africa, Asia Pacific and beyond. GeoNAREM will endeavour to work in closer collaboration with research and academic institutions, NGOs and Government organisations, private sector and other stakeholders with a vision to improving livelihoods by delivering high-standard outputs. ■

GeoNAREM Members

The co-founders of GeoNAREM include:

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For more information on our activities please check our website www.geonarem.org or send an email to info@geonarem.org

Ambient Sensing

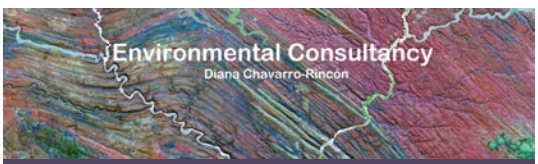
Diana Chavarro-Rincon info@ambient.sensing.com

I was born in Colombia where I obtained a BSc degree in civil engineering and specialized in water resources management. While in Colombia, I worked as a consultant on several projects mainly in agricultural development before joining ITC as an international student in the year 2000.
Once there, I obtained a MSc degree in Geo-information for Water Management and later a PhD in Eco-hydrology from the University of Twente. After graduating, I worked as an associate researcher at the University of Twente and at Princeton University in the USA.

My wide experience in Latin-America, Africa and Europe motivated me to begin working as a freelance international consultant and later I ventured into the fascinating world of entrepreneurship. To that purpose I founded **Ambient Sensing** in 2013. My one-person-company, which is based in the Netherlands, offers services in education, project consultancy and research in the fields of water management, flood modelling, catchment hydrology and GIS/RS applications.

Starting a company is always challenging and can be risky, even more so if you need to learn the tax regulations for entrepreneurs in a foreign country while keeping an eye on current and potential clients mainly based abroad. Having said that, I must add that entrepreneurship is exciting as it gives new professional perspectives and allows room for creativity.

With **Ambient Sensing**, I have had the opportunity to work with well-known Educational Organizations such as ITC-Twente University, UNESCO-IHE and TU-Berlin, international cooperation agencies such as GIZ and have been invited to participate in projects in Latin America. Exciting! ■



For more information: www.ambientsensing.com or contact info@ambient.sensing.com

https://www.facebook.com/ambientsensing/

AMBIENT SENSING
ENVIRONMENTAL CONSULTANCY

Learn all About Earth Without Leaving Home

Geo-Information Science and Earth Observation: a Systems-based Approach

Janneke Kalf j.kalf@utwente.nl

Would you like to take a course in Geo-Information Science and Earth Observation, which is an integral part of a full MSc programme, without having to spend any time away from home?
Faculty ITC (University of Twente) offers for the first time this opportunity, with a brand-new distance course starting this February entitled "Geo-Information Science and Earth Observation: A Systems-based Approach"

Depending on your circumstances, this could be a convenient first step towards taking the remainder of the ITC Master's programme in a face-to-face setting, or simply a smart and affordable way of getting a taste of the full programme. You could also use this distance course to, e.g., acquire a more in-depth understanding of the subject matter or see how your current knowledge level measures up to academic standards. The course consists of three separate but connected 5 EC modules:

Module 1: Geo-Information Science and Modelling (5 EC)
This module will deal with geo-information science covering a range of techniques for data modelling, data collection, data storage, analysis and visualization of spatial-temporal data using Geographic Information Systems (GIS).

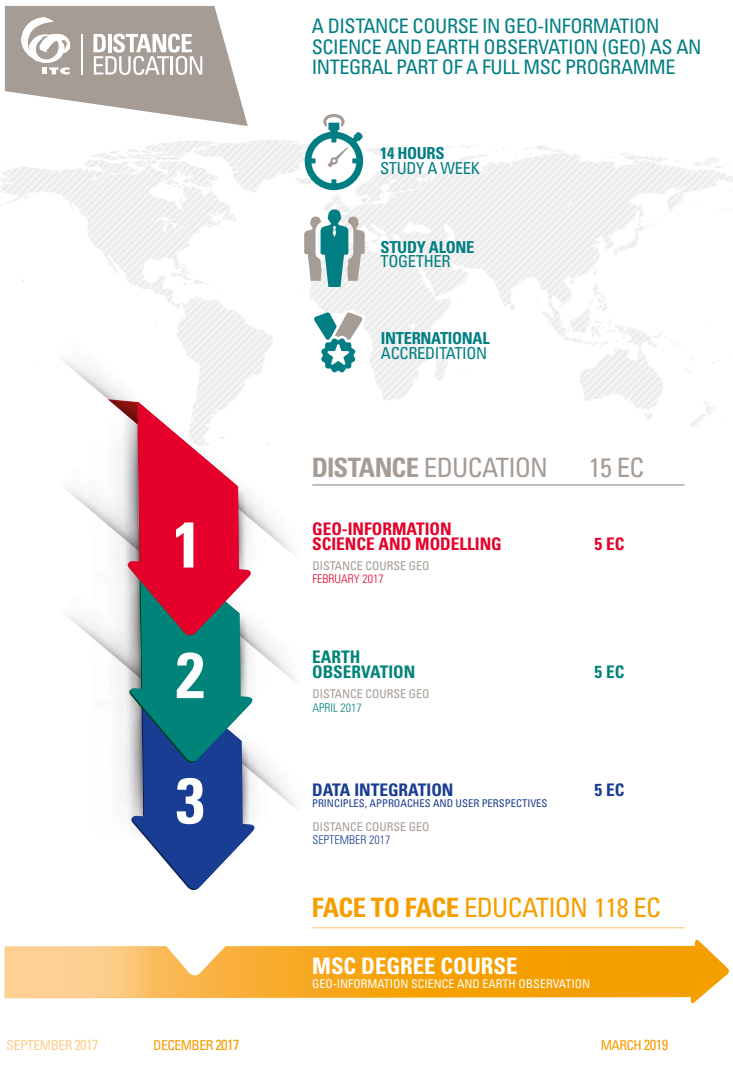
Module 2: Earth Observation (5 EC)
This module will cover the complete process from the specification of image data acquisition requirements, through image enhancement to image analysis and classification.

Module 3: Data integration: Principles, approaches and user perspectives (5 EC)

Module 3 includes three main topics offered through lectures, practical sessions, guided discussions and a project related assignment which are:

- System Earth
- Use and Users, SDI and Geo-Portals
- Data Integration

Each module takes 10 weeks (as opposed to 3 weeks each in full-time face-to-face education). This means that on average you'll need to dedicate 14 hours a week to studying, 2 of which are compulsory hours spent in virtual classroom sessions. You will achieve the same learning outcomes as in face-to-face educa-



tion. As to the educational quality – again, as in face-to-face – you'll be studying under the guidance of highly qualified and thoroughly committed staff, at an accredited and internationally acclaimed faculty.

Added benefits

Make no mistake: even though you'll be studying part-time for about 14 hours a week, this distance course constitutes quite a challenge. That being said, it should leave you with enough time for working a job, parenting or other activities. While there is no physical interaction, the digital learning environment encourages you to interact with your fellow students anywhere, anytime. The course is designed to keep you on track, and you stand to gain important additional skills such as studying independently in a virtual environment. Instead of taking the entire course you can also choose to take one or two separate modules. This could be right for you if for some reason you're particularly interested in (a) specific field(s) covered by the separate modules. Each module is credited in itself.

A smart way to start the full Master's programme

The distance course produces the same learning outcomes and has similar content to the face-to-face course that starts off ITC's Master's programme in Geo-Information Science and Earth Observation. Distance education also takes place in a similarly international (albeit virtual) environment. Consequently, this could be a head start of a full MSc or a sensible way for you to get a taste of the full face-to-face programme, and determine whether you're up to it. The distance course will finish by 3 November 2017, which is one month before the start of the remainder of the regular face-to-face Master's programme (4 December 2017). This could give you the time you need to make arrangements for your transfer into the regular programme, if that is what you want at that moment. If, for whatever reason, you want or need to be back home later on in the programme, you always have the option of working on your thesis there instead of in the Netherlands. Upon completing the distance course you can also choose to postpone enrolling in the rest of the Master's programme. As module exam results remain valid for 6 years, after completing your first distance module you'll have up to 6 years to complete the remainder of the full Master's programme. ■

MORE INFORMATION

More information and application for the distance course: Geo-Information Science and Earth Observation: a Systems-based Approach can be found at www.itc.nl/distance

Instead of taking the entire course you can also choose to take one or two separate modules. This could apply if for some reason you're particularly interested in (a) specific field(s) covered by the separate modules. Each module is credited in itself.

ITC gave Short Course to Geology Community at IGC

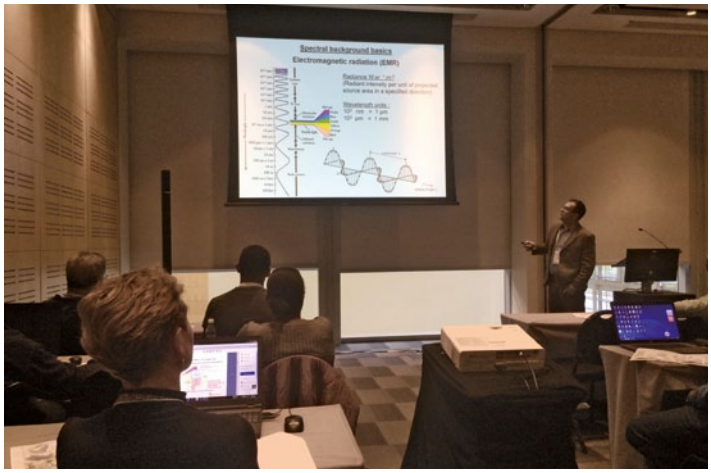
Chris Hecker c.a.hecker@utwente.nl

The International Geological Congress (IGC) is one of the leading global geological conferences, held every four years as part of the International Union of Geological Sciences (IUGS). This August-September, approximately 4000 geologists descended on Cape Town, South Africa for a week of geology talks and workshops (http://www.35igc.org/). ITC's Department of Earth Systems Analysis (ITC-ESA) organized a one-day short course on *"Remote sensing for mineral exploration"*.

The course was specifically designed to expose exploration geologists with little or no background in remote sensing to this modern exploration tool. The participants received an overview of what remote sensing can do for the exploration stage of the minerals value chain. Chris and Rob took them through the entire workflow, from searching appropriate images with the web based data providers, to processing the images and generating follow-up targets for ground investigations. The key essential background knowledge on mineral spectroscopy, geological remote sensing and its caveats were also presented. The overall focus of the workshop, however, was on generating affordable geological map products from accessible multi-spectral satellite imagery. Free software solutions were provided to allow participants to practice with real data during the course, as well as continue working with supplied remote sensing data at their offices after the course.

The course attracted over 20 participants from different geological backgrounds and countries as variable as Nigeria, South Sudan, Iceland, Germany and of course South Africa. It included representatives from the exploration industry, government organizations and universities. Since the end of the course, several course participants have been proactive in keeping in close contact with the instructing team to discuss and seek assistance on data and processing issues. We hope to continue the work with them and to welcome some of them for a follow-up course at ITC in Enschede in the future. ■

ASTER "regolith ratios" *(sourcedata: JPL/NASA)*



The participants received an overview of what remote sensing can do for the exploration stage of the minerals value chain

"GIS Technology Has Become a Major Tool for Many of Us Trying to Conserve Wildlife"

Dr Jane Goodall, founder of the Jane Goodall Institute

Yiwen Sun y.sun@utwente.nl

With the exponential growth of human populations over the past centuries, and the consequent demand on natural resources, the Earth is being transformed from large expanses of natural vegetation into a patchwork of natural, modified and man-made ecosystems. Wildlife species have suffered severe decline and range contraction worldwide, and many have become threatened with extinction due to ongoing threats from habitat loss and anthropogenic disturbance. As these changes occur over vast areas, within time frames beyond everyday human perception, and at places with difficult access, measuring and monitoring on the ground is laborious and limited.

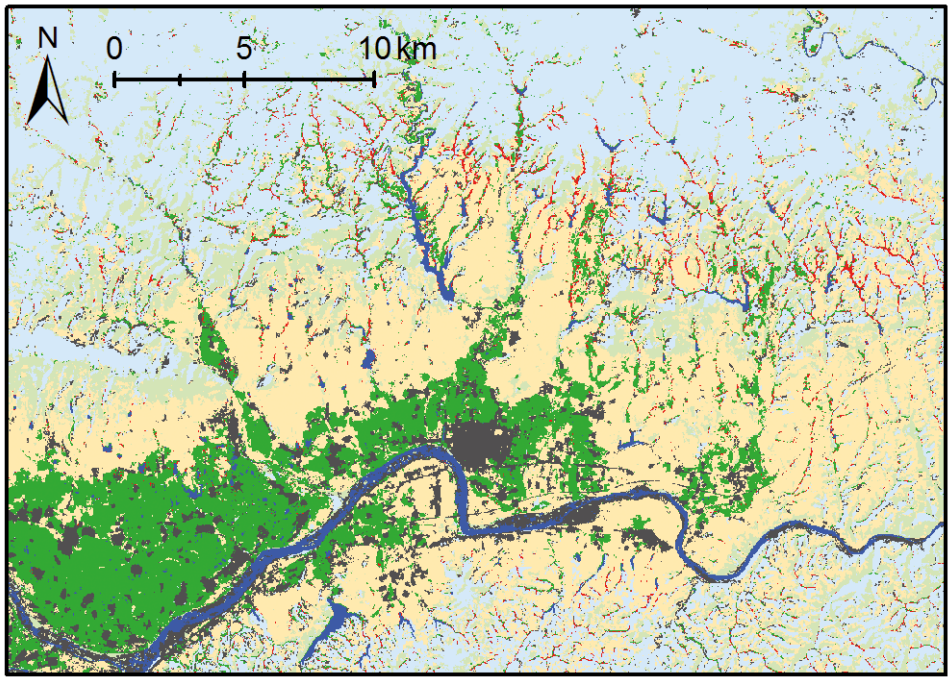
As one of the most evolutionarily distinct and globally endangered birds, the Asian crested ibis *Nipponia nippon* was originally widespread in East Asia. Unfortunately, its population declined severely in the mid-twentieth century due to the combined influence of habitat loss (due to changing farming practices) and the high risk of human-induced mortality, leading to extirpations throughout almost all of its former range. The last seven individuals were discovered in 1981, in a remote village on the southern slopes of the Qinling Mountains of China. Thanks to an intensive conservation effort during the last 30 years, the relict population has been increasing in size and expanding its geographical range. However, knowledge about this species and its habitat is still too limited for a comprehensive landscape-scale conservation plan.

On 22 June 2016, ITC PhD student Yiwen Sun successfully defended her PhD thesis

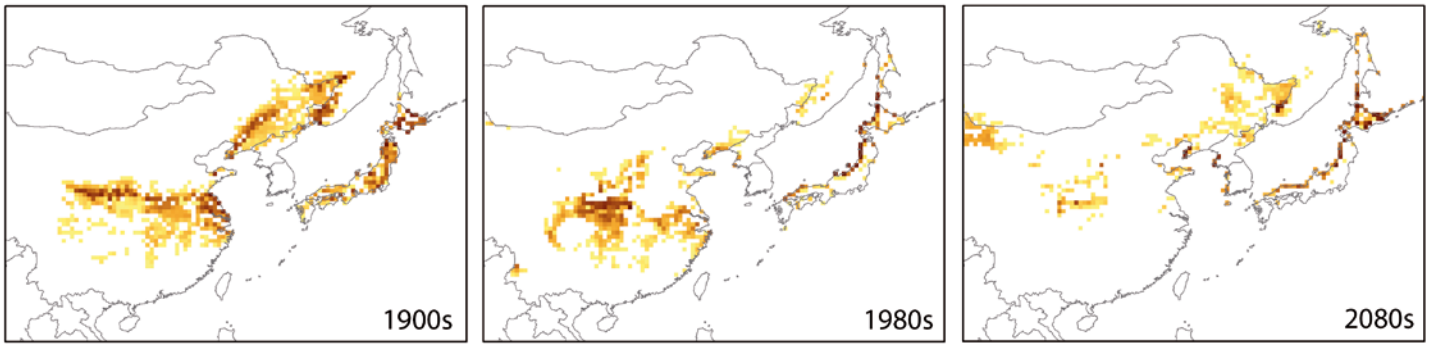
Dr Yiwen Sun (left) receiving her degree certificate from Prof Andrew Skidmore

For most endangered species, their chance of recovery depends on whether their critical habitat is identified and protected and/or restored. Analyses of multi-temporal satellite data were performed to monitor the spatio-temporal change of traditional winter-flooded rice fields – the critical habitat for crested ibis – over the past decades. Integrated remote sensing and GIS techniques yielded precise spatial information on the distribution of scattered winter-flooded rice fields in the mountainous topography. Unexpectedly, the habitat was found to have continuously reduced

A breeding pair of crested ibis *(photo:Yange Yong)*



Satellite-derived land cover/use map (key habitat in red) across the current range of crested ibis



Predicted suitable areas for breeding crested ibis in the past, present and future under climate and land cover/use change

across the current range of crested ibis even under protection, which is likely to pose a threat to the population recovery of crested ibis in the local area. On the other hand, the analysis of spatial patterns in species and habitat distribution showed that the dependence of crested ibis on the winter-flooded rice fields varied spatially and decreased over the years, with the recent return of crested ibis to more varied habitats.

Species distribution modelling with satellite-derived environmental predictors offered insight into habitat preferences of crested ibis and the availability of potential suitable areas. Integrating the species-environment relationship into an individual-based model allows for a combination of analysis of spatial landscapes and knowledge of animal behaviour and population dynamics. Given the current strict conservation combined with higher public awareness, the hybrid range dynamic model predicted that the crested ibis population would increase in size and expand its range in the next 50 years, and recolonize parts of the former range. Among the life-history trait parameters that affect the range dynamics of crested ibis, adult survival probability and the proportion of long-distance dispersal events showed the strongest effects.

Using historical data and future projections, ensemble species distribution modelling and ordination techniques were applied to establish baseline information on the geographical and ecological distributions of crested ibis at a broad scale, and to explore the impact of climate and land cover/use changes on its distribution. The crested ibis was found to occupy similar niches between seasons and over time. In the face of future climate and land cover/use change, the potential suitable areas for crested ibis were predicted to shrink and shift northward.

In summary, the advanced application of geo-information and geospatial technologies provides us with a simultaneous understanding of patterns and processes of landscape change as well as detailed responses of species to these modifications over geographical space and time. This research has proven the value of developing and applying geo-information technologies for biodiversity monitoring and conservation. These findings enable prioritization of conservation efforts, and provide timely and accurate information for conservation biologists and governing authorities to implement proactive strategies for *in-situ* conservation and reintroduction of crested ibis. ■

ITC Alumni Join Forces in Cropmon Project

Mila Luleva mila.luleva@soilcaresresearch.com

Cropmon is a three year project, funded by the Geodata for Agriculture and Water (G4AW) facility. This project aims to develop and make available an affordable information service, that provides farmers - including smallholders - with information that helps them to make improved farm management decisions during the growing season.

When crop growth is non-optimal, farmers receive alert messages based on near real-time satellite imagery. Using a variety of spatial data layers such as actual weather data, soil analysis data and farm data, the most likely factors that could limit crop growth are determined. This information is then used to make comprehensible, farm and crop specific recommendations for farmer practices, which are returned to the farmers via SMS and/or a mobile app.

The project focuses on farmers and their crops of coffee, maize, grass and sugarcane in the southwestern part of Kenya. The goal is to reach 150,000 farmers after the first three years of the project, but we will definitely not stop there. The aimed results for the farmer are 10% yield improvement, 10% more efficient use of fertilizer, and/or 10% income growth.

Once successfully established for these target crops and areas, the information service will be implemented for other crop types, as well as in other counties in the years following the project period.

The partnership consists of project coordinator SoilCares Research BV, Dutch partners Springg BV, NEO BV, Weather Impact BV, and Kenyan partners Cereal Growers Association (CGA), Coffee Manamgent Services Ltd (CMS), Equity Group Foundation (EGF), Sugar Research Institute (KALRO) and SoilCares Ltd. Having a rich pool of scientific knowledge for development of the technology as well as a solid basis for the rollout and implementation of the service in the field, the Cropmon partnership is capable to deliver an information service that will improve livelihoods of farmers across Kenya.

Cropmon

Mila Luleva

Researcher - SoilCares
MSc GEM 2005-2007
PhD ESA 2007-2013

Mila Luleva

I work for SoilCares Research, the project leader in the consortium. Our mission is to be able to take the farmer by the hand and help him secure his livelihood and the food on his family's table. We help him analyze his soil, give him affordable technology, and guide him through the best crop management practices. Crompon is a very exciting project, where specialists with different background and expertise come together to ensure that Kenyan crops are taken good care of. It is great to see that our wide ITC alumni network sees no borders. After many years, we yet again manage to find each other and work together for a wonderful cause.

Betty Mulianga

Centre Director – KALRO Sugar Research Institute
Master GIM 2003 – 2004
MSc GEM 2007 – 2009

SRI in partnership with SoilCares research is piloting crop monitoring program across the Western region of Kenya for sugarcane farmers. The SRI project coordinator, Dr Betty Mulianga, an expert in Remote Sensing is utilizing the expertise of SRI agronomists, extensionists and the sugar factory agriculture managers and factory extensionists to ensure the objective of Cropmon project is realized. Currently, the team led by Dr. Mulianga is collecting agricultural land information using the GeoODK application. GeoODK electronic data collection application was developed by Spring Company, one of the collaborating partners in the project. This application was aimed at enabling extension officers to encode field boundaries that would facilitate acquisition of crop information from satellite images. It is this extracted crop information from respective fields that informs crop monitoring by the Cropmon project experts. During this training on use of the GeoODK application, field data collection was targeted on sugarcane farms in Kakamega County. Each participant required a Smartphone to facilitate this activity.

These efforts by SRI are focused on linking field data collected by extension officers from representative sites with quantitative satellite data on vegetation conditions to create a data portal from which timely and representative data on sugarcane crop conditions can be compiled and disseminated to farmers to inform agricultural and policy decisions and agricultural development initiatives for the region.

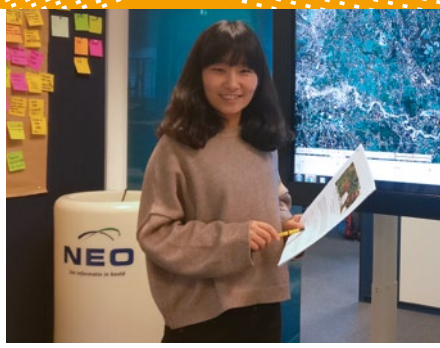
Betty Mulianga and Peter Mwangi

Peter Mwangi

Spatial analyst / Modeller
MSc NRM 2008-2010

Working with Cropmon Project, SoilCares Research.
This one took me by surprise thanks to Mila (my long lost ITC friend and then PHd student during my Msc. NRM from 2008 to 2010) but I enjoy every moment working for Cropmon. My task at hand in the Cropmon project is trying to bridge the knowledge gap on Geo-information technology with the farmers and farmer's associates. The Cropmon interactive tool through mobile phone short messages (sms) will be used by farmers to optimize their cash crop growth and yield to the ever demanding market in Kenya and beyond.

Pictures speak a thousand words; probably maps speak 10 thousand words. This was definitely my take home message after I presented about remote sensing to coffee farmers in a rural part of Kenya. The epic moment of it was when the farmers could actually identify their coffee farms from a high resolution imagery map that I had compiled for my presentation. It immediately makes the audience connect with Geo-information technology and start realizing its benefits.



Fang Fang

Fang Fang,

Geo-information and Remote Sensing Specialist - NEO BV.
MSc GEM 2013 - 2015

I now work as a geoinformation specialist at NEO B.V., a Dutch company specialized in earth observation and geo-information solutions in Amersfoort. Currently, I work on the Kenya Cropmon project together with Mila. I feel really excited to work on such project, as it is really nice to see how scientific research is transformed to tackle problems and to be useful in practical cases. It is also meaningful to work on this project as earth observation techniques will potentially help Kenyan farmers implement better farming practice to improve the yields.

My work on this project is to develop and automize the processing workflow of deriving vegetation indices for agricultural parcels using satellite imagery from different sensors. This is very important for providing most up-to-date valuable information in time for analyzing and monitoring the crop growing status, so that this information based alert or farming advice could be sent to Kenyan farmers timely.

Dennis Ojwang

GIS Specialist - CIFOR
MSc NRM 2013-2015

I am Dennis Ojwang, a Kenyan MSc graduate from ITC (NRM, March 2015). I currently work as a GIS specialist at Center for International Forestry Research (CIFOR), Nairobi hub. CIFOR is a non-profit, scientific facility that conducts research on the most pressing challenges of forest and landscape management around the world. I am involved in mapping forest cover changes, modelling trends and dynamics through a multidisciplinary approach including skills and techniques I learnt from ITC such as GIS, Remote Sensing and Statistics in Research.

I got to know about Cropmon in March 2016 when I was contacted by Researcher Mila Luleva from Cropmon regarding some techniques and data I used in my MSc thesis. She came across my thesis document through ITC online library and she was interested about knowing and using some of the techniques in the thesis document to develop crop and grass monitoring models. I provided her help and an insight about applications of hyper-temporal NDVI data in developing rangeland monitoring models. I am happy to hear that the information I provided was very useful to her in developing grass monitoring tool for Cropmon.

ANNOUNCEMENTS

Library Books in the Clouds

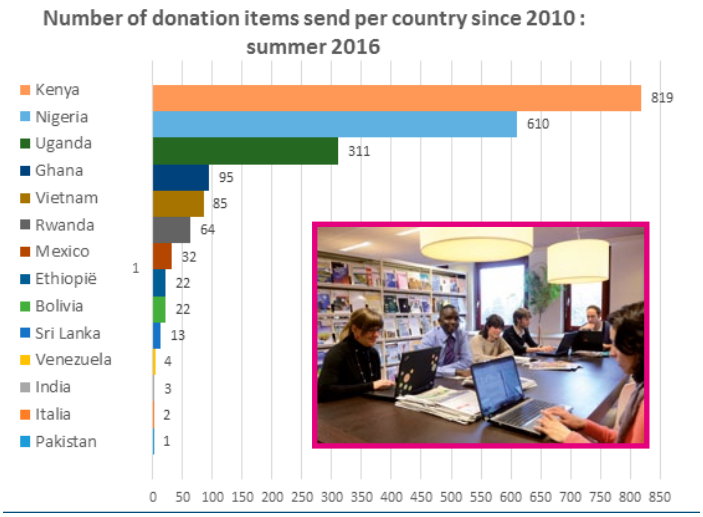
ITC Donation programme

Carla Gerritsen c.m.gerritsen@utwente.nl

In response to two of our latest orders, we are sending out another two shipments with DHL in connection with the ITC Library donation programme – to Uganda and Vietnam this time. A total of 69 books are flying across the world to two ITC sister libraries. In Uganda, our contact in the Faculty of Agriculture library is an ITC alumnus and in Vietnam the NICHE-vnm-106 Program is the linking pin to the library donation programme. Most of our relationships with other university or faculty libraries run through our alumni – thanks for that!

For those who are unfamiliar with our programme: in May 2010 we started our own webshop – www.donationprogram.nl – in which we offer printed books and journals to libraries of institutions ITC has connections with in any shape or form, whether through a joint educational programme or a research project. Libraries that have ties with ITC and a need for printed resources can request them from our webshop free of charge.

The stats below show how many titles have been requested and sent through our programme since the start in 2010 ,and where they have landed.



All content of this programme comes to us in the form of donations. By ITC staff that are emptying rooms or retiring, or former staff moving house and finally deciding they have to part with several metres' worth of books, the contents of which we carefully scan to ensure the material is still relevant.

One of the larger contributors to our collection was the ITC bookshop when it closed its doors in 2011. We took their entire book inventory and made it available via our webshop. From the Twente University Library journal archives we selected titles on ITC subjects when digital access surpassed printed journal editions.

A great new development is the donation of new printed books from external institutions. In April 2014 we received a very sizeable donation from the Faculty of Architecture and the Built Environment, CITG, dept. OTB from Delft University and in June of 2016 the Law institute of the University of Leiden, the Vollenhove institute, donated five major titles straight from the printers belonging to their Land Administration collection, almost 200 copies of these books on Land governance and Land use practices are now available from the webshop.

And our biggest selling item? The ITC Core book. Never long on the shelves, sometime even on request until an extra copy comes in. Did you know that it is available online? You can find it here (read online only): www.itc.nl/Pub/Home/library/Academic_output/ITC-GIS-and-Remote-Sensing-Textbooks.html

Since our first article on the donation programme in the ITC News 2011-4, our inventory has been shipped off and restocked, again and again, so with our five year anniversary online we are happy to say that we can keep up our research support for library collections worldwide. ■

One thing that has changed
is our e-mail address, donex-itc@utwente.nl is the new e-mail address that came with our UT connection. Please send us an e-mail if you have any questions regarding the ITC faculty library donation programme or want to make use of the online shop. *We look forward to hearing from you.*

ITC alumna Dr Xuanmei Fan Winner of IAEG Richard Wolters Prize

Niek Rengers rengers@itc.nl

Dr Xuanmei Fan obtained her PhD degree from the ITC Earth Systems Analysis Department in September 2013. After her PhD she was employed for one year by the United Nations Institute for Training and Research (UNITAR) in Geneva as a disaster risk reduction training expert. In 2015, she started working for her home university, the Chengdu University of Technology in China. Here she was promoted to a professor position in 2016.

In August of this year, Dr Xuanmei Fan was awarded the Richard Wolters Prize by the International Association for Engineering Geology and the Environment (IAEG) during the 35th International Geological Congress in Cape Town, South Africa. This prize has been awarded biannually since 1986 to outstanding young scientists in the engineering geology and geoscience profession, in order to commemorate the life and work of Dr Richard Wolters.
Dr Xuanmei Fan is the first female scientist from China to obtain this award. Xuanmei's PhD supervisor, Dr Cees van Westen, won this prize 20 years ago. In her award ceremony speech, she acknowledged the great support of her supervisors Dr Cees van Westen, Dr Qiang Xu and Dr Runqiu Huang, as well as the quality of the education she received both at ITC and at her home university.

Dr Xuanmei Fan's research focuses on the disaster chain effect: earthquake→landslides→landslide dams→dam-break flooding→post-earthquake debris flows→long-term effect of increased sediment transport.

Due to her important scientific achievements, she has already been awarded many national and provincial prizes: "The First Prize for National Science and Technology Achievements" in China in 2014; the Gudezhen Outstanding Young Engineering Geologist Technology Award from the Chinese IAEG National Group in the Geological Society of China; the Sichuan Province Youth Science and Technology Award; and was picked up by the Recruitment Program of Global Experts. She received research grants amounting to a total sum of more than 6 million RMB. This year Dr Fan successfully applied for the National Science Fund for Outstanding Young Scholars of China, which is China's highest level grant for young researchers. ■

Photograph of the award presentation by the Executive Committee of the International Association for Engineering Geology and the Environment (IAEG) taken during the International Geological Congress (IGC) in Cape Town, South Africa, August 2016)

Third Recognition "Top Rated Programme"

In the latest edition of the Keuzegids Masters, ITC's master programme Geo-information Science & Earth Observation was given the quality seal 'top rated programme' for the third time in a row. A great recognition for our efforts.

De Keuzegids compliments the organization of the educational programme, with ITC being open and clear about requirements and rules. Also, facilities as the library and other study rooms are rated highly.

How we rated

In the Keuzegids, programmes are awarded scores between 20 and 100, and if they score 76 or more, they are awarded the designation 'top rated programmes'. The Geo-information Science & Earth Observation programme received a rating of 82, six more than last year. It is the highest score of all master courses of the University of Twente. Besides the ITC master, Applied Physics, Chemical Engineering, Sustainable Energy Technology and Technical Medicine are all 'top rated programme'. ■

Third place in Copernicus Masters 'Sustainable Living Challenge'

Communication department newsmagazine-itc@utwente.nl

A team from ITC, including MSc alumni Mr Yismaw Abera (Ethiopia), Dr Mila Koeva, and Dr Rohan Bennett, claimed 3rd place in the European Commission's (EC) and European Space Agency's (ESA) Copernicus Masters 'Sustainable Living Challenge'.

The awards were handed out at a ceremony on the 25th October 2016 in Madrid. The placement means the team was also invited to take part in an Accelerator Bootcamp from 24-26 October in Madrid, Spain – as well as an 8-month coaching programme.

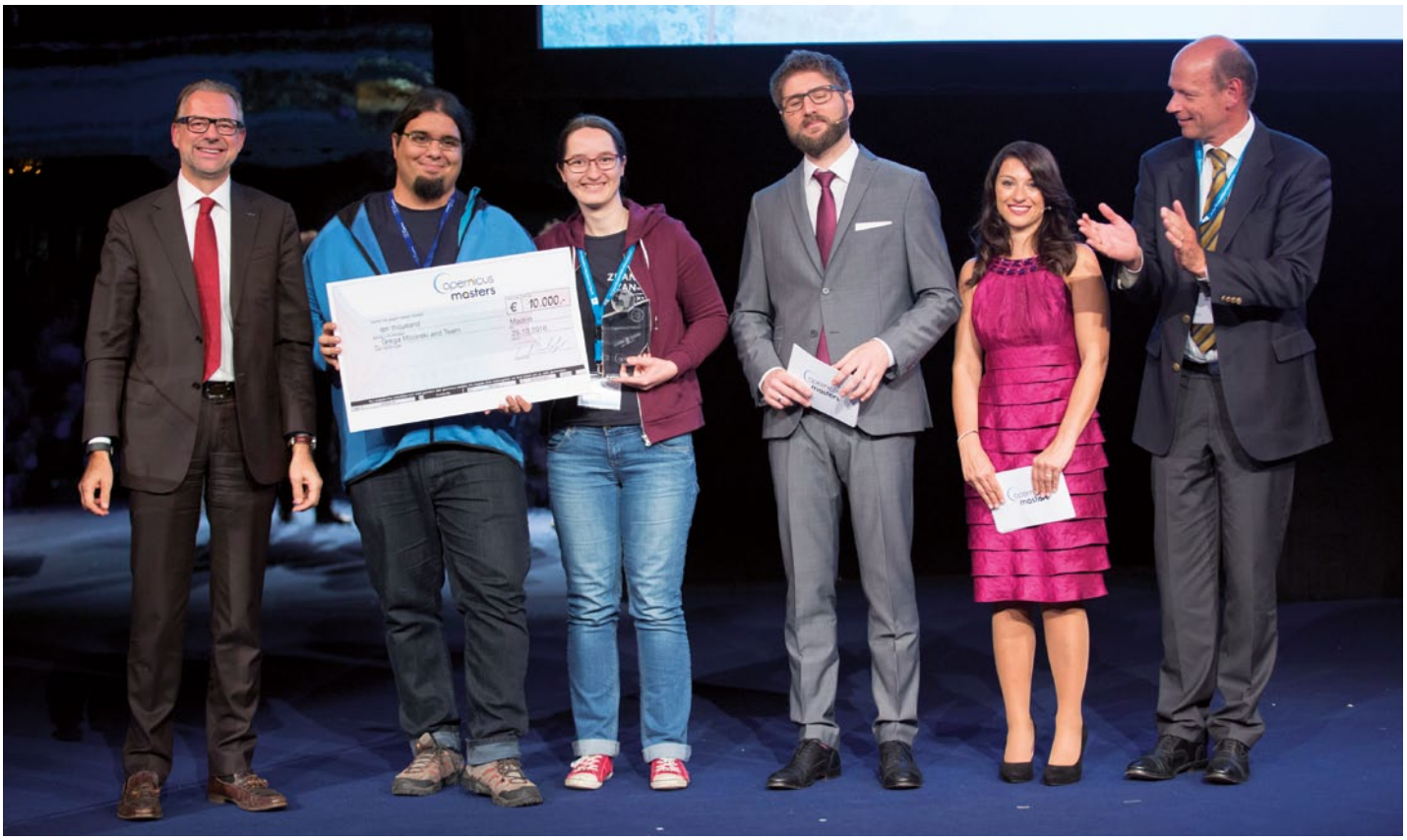
Copernicus programme

The Copernicus programme focuses on supporting entrepreneurship and business development around the use of earth observation data. Receiving more than 900 submissions from nearly 70 countries over the past five years, the organizers selected and rewarded 40 winners from among the masses. The awards are sponsored by: the European Space Agency (ESA), the German Aerospace Centre (DLR), T-Systems International GmbH, Satellite Applications Catapult Ltd., the German Federal Ministry of Transport and Digital Infrastructure (BMVI), and Stevenson Astrosat Ltd.

Broader suite

The ITC team's concept is part of a broader suite of automated cadastral boundary extraction projects collaboratively being undertaken by the PGM and EOS departments at ITC – including Sophie Crommelinck's work in its4land (its4land.com) and the post-doc work of Dr Divyani Kohli. The pitch of Yismaw, Mila and Rohan focused on using high-resolution satellite imagery and readily available feature extraction tools and software to support faster and cheaper mapping of the millions of unrecorded land interests in sub Saharan African countries. Spatial documentation of land rights is known to be a key component in supporting delivery of sustainable development.

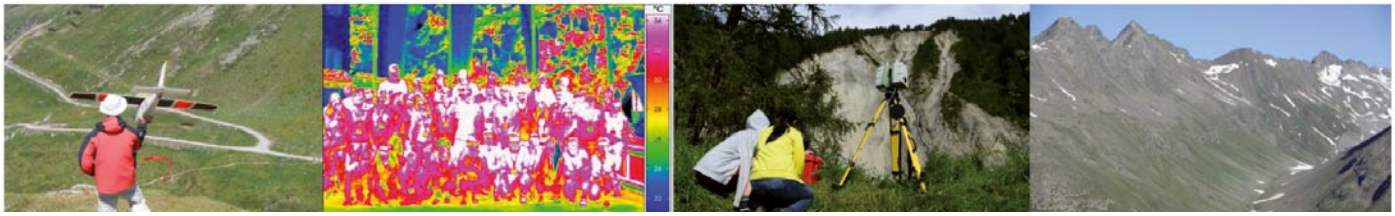
The Accelerator Bootcamp and subsequent coaching programme provides the team with an industry mentor that is to work with the team over an 8-month period in converting the promising idea into a plan for market and achieving measurable results. ■



Innsbruck Summer School of Alpine Research 2017

Close Range Sensing Techniques in Alpine Terrain

Obergurgl (Austria), 16.07. - 22.07.2017



University of Innsbruck, Faculty of Geo- and Atmospheric Sciences
International Society for Photogrammetry and Remote Sensing (ISPRS)
Austrian Academy of Sciences, Institute for Interdisciplinary Mountain Research

Greetings from…

NAME:

Daniel Njoroge Githira

JOB DESCRIPTION:

International Intern at ESRI under the Facilities Management Team in the department of Professional Services

ACTIVITIES

My day to day project work focuses on developing GIS solutions for Facilities Management, ranging from mapping their interiors, visualizing them in 3D and enabling their indoor routing in web applications..

Project Activities

At Esri, I am working with a team dedicated to the development of a GIS framework for Facilities Management – throughout the entire life cycle. My tasks involve enabling automated migration of CAD data to the GIS environment, aligning associated data for storage in relational databases, and developing WebApps such as Campus Viewer and routing applications.

This position has allowed me to interact with a wealth of spatial mapping technologies within the ArcGIS platform, most of which I barely recognized prior to my internship. Examples of these include ArcGIS for Server, AppStudio for ArcGIS, ESRI CityEngine, ArcGIS Pro and numerous geoprocessing tools. Every now and then, a task will come up that will demand a tool outside the custom toolbox, and brainstorming for solutions with clients and workgroups has tremendously enhanced my consulting capacity.

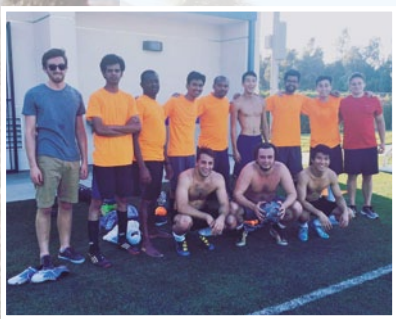
Training and Networking

My internship started with a training opportunity where I took a mix of 10 Esri classroom and online instructor-led courses. Because of the sturdy training I got at ITC, my start at Esri was relaxed. So far, I have trained in Geoprocessing-scripting in Python, deploying multi-user databases version 10.4, and sharing contents on the Web among others. Every new lesson comes with a new instructor and new students, who are often from diverse backgrounds, and this makes interaction very enlightening.

Additionally, working with Esri has expanded my interaction with GIS professionals from all over the world. In San Diego, at the 2016 Esri User Conference, I was delighted to meet Facilities Management team leaders, ITC Alumni, lead GIS users from my home region (Eastern Africa), and developers of popular applications such as Drone2Map and Insights for ArcGIS.

Living in Redlands

With Esri taking so many summer interns, getting a team to explore California's landscape has not been hard. Hiking the mountains of California is fun but tiring, so being an urban planner, I have preferred exploring the townscapes of San Diego, Los Angeles, Hollywood and San Monica, which are a little more than an hour's drive from Redlands.



Even within Redlands, there is a lot to do. This not-so-big town offers a convivial environment for all visitors, with festivals, concerts and many private events. Every Thursday comes with a Market Night, an outdoor farmers market, graced with charming outdoor performances. Most Wednesdays I join the interns' football team while other days I play tennis with friends or go to the gym.

Conclusion:

The learning that this internship has exposed me to is enormous, particularly in the IT field, which I was only comfortable treading along the edges of. Now my ability to read and write code for desktop and web applications has greatly improved, so it might as well be fun. The fact that I have been able to set my network right within the GIS profession stands tall among other achievements. Of course experiencing life in the US – business culture, food, measure units, politics – has been fun and memorable too. I am grateful to Esri and ITC for facilitating my internship. ■

Greetings from…

NAME:

James Varghese

JOB DESCRIPTION:

Intern at Public Safety - Industry Marketing department within Esri.

PRODUCTS

Support GIS Analysts, who in turn help first responders manage Disasters more effectively and efficiently.

Projects

My day-to-day activities involve creating Disaster Web Maps, constructing and designing a Time Enabled Web Mapping Application template, building Esri Story Maps, updating documentations for Public Information Maps, researching Web GIS applications in Emergency Management, Law Enforcement, National/Homeland Security, Wildfires and of course keeping myself up-to-date with the ever evolving ArcGIS technology. Additionally, I have been attending Esri Online training classes, which is part of the internship. Participating in the larger than life Esri International User Conference 2016 in San Diego left me dumbfounded by the way Esri managed this event so efficiently.

The Disaster Response Program (DRP) is the flagship of the Public Safety department, therefore my priority shifts from my day-to-day tasks whenever an Organization requests for assistance in the context of a Disaster/Emergency event. I had the opportunity to be on-site to witness and learn how Geospatial Analysts help Public Information Officers and first responders manage a Wildfire disaster in Southern California. It was inspiring to watch how the first responders put their lives at risk to save people and property and put out the raging wildfires that are common during the summers in Southern California. It is indeed a dream come true to find an internship where the work I do matches closely with my educational and professional background. Since my MSc degree in Applied Earth Sciences at ITC had a specialization in Natural Hazards and Disaster Risk Management, I couldn't have asked for a better Department to undertake the internship.

Social Activities

Weekends are incredibly exciting as I get to visit so many exquisite locations. So far I have been around Redlands, San Diego, Santa Monica and plan to visit some more places like the San Francisco Bay Area during Thanksgiving public holiday. Visiting open Market Nights, restaurants or even walking in a nature park are welcoming experiences. Lunch with members of the Public Safety team is another activity which I have had the opportunity to be part of. Usually some of the most interesting conversations I had with people have been around lunches and dinners. It is humbling to participate and share in the common activities that people engage in both within and outside of Esri. The nice thing about participating in social events is the possibility to meet new people and make friends.

Reflections

For a person like me who hails from South Asia, visiting Europe and America within two years is like taking a dip in the east-west melting pot of cultural diversity. This has very clearly amplified my outlook towards life itself and essentially broadened my career perspectives. I have realized that it is imperative to enjoy every moment of my life no matter where I go; however, remaining down-to-earth while relishing these moments is what adds value to the overall experience. I will indeed cherish this internship experience for a lifetime. I would like to thank ITC for presenting me with this invaluable internship opportunity and I feel grateful to Esri for considering me worthy enough to be part of their team. ■

LIFE AFTER

"It's Amazing! That's it, End of Story!"

John Ray Bergado j.r.bergado@utwente.nl

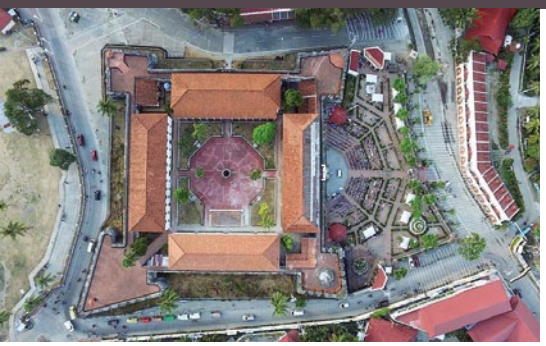
It was a mix of emotions I felt when boarding that plane to fly from Manila to Abu Dhabi, the first of the two flights I had to take to go to ITC, the Netherlands, where I was starting my Master of Science (MSc) degree program. I felt excited, free, and optimistic; but at the same time anxious, afraid, and skeptical. It was my first time boarding a plane and also my first time to leave my country, so I guess I had enough reasons to be terrified. But thankfully, the curious and adventurous part of me kept me motivated (or, should I say, distracted) enough to neutralize the anxiety I felt during the whole trip. Taking that trip was a "big leap" or so I thought, unaware of the "bigger leaps" I had to take during my MSc degree.

But how did I actually end up taking my MSc at ITC? Well, as far as I remember, it all started with a random dinner night with one of my friends. He was my senior in high school, one year ahead of me and in an equivalent section. He is an Erasmus Mundus (EM) scholarship recipient; and was, at that time, bound to start his EM-funded MSc program at three different European universities. We had a nice chat and he suggested that I apply for the scholarship as well. I was hesitant about his suggestion. Would I even qualify for such a competitive scholarship? Would I be able to survive in Europe?

To suppress my hesitation, I started searching the web for information about the scholarship. I found two programmes related to my undergrad degree and another two that were unrelated but still interesting for me to pursue, given the chance. The good thing is, before deciding on which programme to apply for, I had a chance to meet my former teacher in undergrad who was, at the time, on a short holiday from his PhD studies at ITC. During this meeting I discovered that the MSc programmes offered by ITC are far more closely related to my field of study than the programmes I had been looking at. So I decided to apply for the MSc Geoinformatics programme at ITC, with EM funding. Fortunately, I made it through the cut and was accepted as one of the EM grantees. Reading the email from the EM consortium confirming I was awarded the scholarship was pure ecstasy! From then on, I was ready to start another chapter of my life in uncharted territories.

So much for my backstory; let me now share my MSc experience at ITC. If I had to capture such a once-in-a-lifetime experience in one sentence, I would just have to say: "It's amazing!". That's it. End of story. But let me elaborate a little on how amazing the experience has been for me. I met and was taught by some of the brilliant minds in the field of Geoinformation Science and Earth observation. I made awesome friends from different countries, cultures, and backgrounds. I was challenged throughout and have learned a lot: not only from my lecturers and professors, but also from my peers and classmates. That's why I, having always valued personal independence and freedom, love how the University of Twente and ITC implements a very student-centered style of learning. And although most of my friends in the MSc programme would disagree, I personally like the modular system of ITC as well. It allows the student to focus on one thing at a time, while stretching students' limits on how quickly they can absorb the concepts of the module.

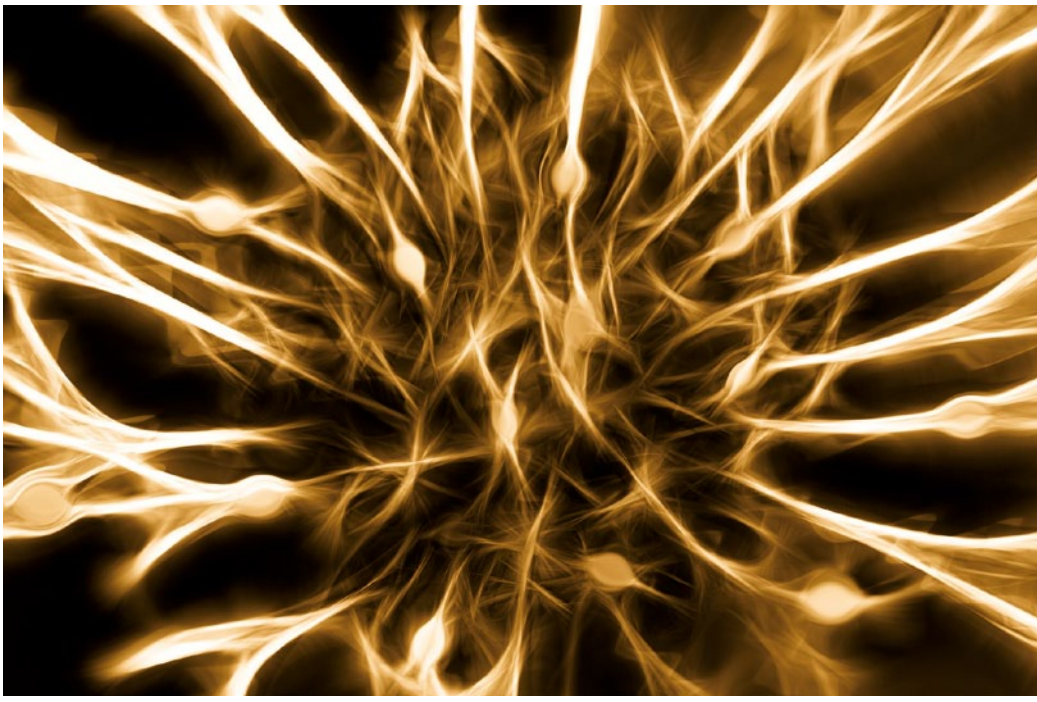
The struggle with the modules was a great learning experience through which I've grown both personally and academically. But what I enjoyed the most is that I get to research an area I'm really interested in: machine/statistical learning (ML). I'm very fond of of automating things; and ML takes automation to a different level. Instead of specifying (and programming) fixed rules on how to solve a problem, ML tries to automatically construct these rules based on relevant data. It sounds like black magic at the start but it's actually just maths at work. Obviously, ML methods will be useful for problems where there are infinitely many scenarios, each of which is



The research work will generally be about developing predictive models for wildfire hazards and risks

supposed to be captured by a corresponding rule – in other words, problems we don't actually know how to write the rules for. Moreover, ML is particularly suited for problems with abundant data. This abundance of relevant data, series of satellite observations, geotagged images, geolocated environmental sensors, laser point measurements, etc., is very common in the Geoinformatics domain.

My MSc work revolved around the investigation of deep learning methods for classification of urban land covers in sub-decimeter resolution aerial images. Deep learning puts another dimension of automation on top of ML. Deep learning provides a way to automatically "learn" representations of the data such that better rules can be constructed based on these representations. Over the course of my MSc work, I had a chance to collaborate with two supervisors and one PhD advisor. They were all easy to work with and I have learned a lot from them. My first supervisor wanted to continue the work we started in my MSc and has recommended me to one of the professors in our department who has an available PhD staff (AiO) position. The research work will generally be about developing predictive models for wildfire hazards and risks. After meeting and discussing with my first supervisor and the professor, consulting with my family and friends, and personally reflecting on the opportunity at hand – I decided to take a "bigger leap" and start my PhD studies, now in a more familiar environment. Still, in the end, it is still research. And research often, if not always, requires us to roam and plunge into the unknown! ■



Deep learning of nerve cells

John Bergado

Alumni Meet San Diego - Esri User Conference

Lyande Eelderink l.eelderink@utwente.nl

A delegation from ITC attended the Esri User Conference. As usual, the Conference provided an outstanding platform to meet with ITC's clients, relations and alumni. ITC was present with a booth at the Tuesday-Thursday exhibition and at the Monday evening academic fair (both courtesy of Esri).

This year's ESRI User Conference theme was: "GIS – Enabling a smarter world." During the plenary session on Monday morning, Jack Dangermond, the President of Esri Inc., explained the following to the audience of some 15,000 GIS practitioners:

"In the last decade, the technology industry has been putting forth a vision of creating a smarter world with technologies and systems that help people and organizations become more efficient and effective. A smarter world will mean a world where decisions and actions are enabled with real time data, analytics and automation applications that improve efficiency and decision making. As GIS integrates smart technologies, such as the 'Internet of Things' and big data analytics, GIS professionals will increasingly be asked to use their capabilities to build systems that support real-time problem applications such as energy usage, emergency management, environmental management and applications that drive efficiency in fields of logistics, task force capabilities and faster response."

On Wednesday evening, the traditional ITC alumni reception was held, attended by some 50 alumni and further ITC business relations. During the reception, Jack Dangermond paid us a visit with his guests from various American geospatial organizations. This was very much appreciated by the ITC alumni and ITC staff. We obviously did not miss out on the photo opportunity thus given. ■

Prof Tom Veldkamp (Dean ITC) and Jack Dangermond (ESRI)
Photo: Jan Willem van Eck

ITC alumni meetings 2016

ALUMNI MEETS AROUND THE WORLD

2016 was a fruitful year for the ITC Alumni network. A total of 16 events around the world where organized. Some only open for ITC alumni others open to all Dutch alumni organized by Nuffic or the local Dutch Embassy. Next to these 'official' meets many informal meets were realized as well. Through social media many photos and selfies were posted to show the strength of the ITC alumni network. Below you can see the spread of the ITC Alumni meets in 2016… As I do not have enough space to publish all the stories of the events two of them are described in detail. Is your country not on the list of 2016, please contact me and we might be able to organize something in 2017!

For more information:
alumni-itc@utwente.nl

- **ITC** Alumni Meet Windhoek (Namibia) 12-feb
- **ITC** Alumni Meet Dhaka (Bangladesh) 4-mrt
- **Holland** alumni Meet Teheran (Iran) 12-apr
- **UT-ITC** Alumni Meet Beijing (China) 13-apr
- **ITC** Alumni Meet Nairobi (Kenya) 8-jun
- **ITC** Alumni Meet San Diego (USA) 29-jun
- **ITC** Alumni Meet Prague (Czech Republic) 17-jul
- **Global** Dutch Alumni Café Quito (Ecuador) 20-okt
- **ITC** Alumni Meet Kampala (Uganda) 25-okt

- **ITC** Alumni Meet Kigali (Rwanda) 5-nov
- **Holland** Alumni Meet Lagos (Nigeria) 9-nov
- **Holland** Alumni Meet Jakarta (Indonesia) 22-nov
- **ITC** Alumni Meet Pretoria (South Africa) 24-nov
- **Holland** Alumni Meet Bogota (Colombia) 24-nov
- **Holland** Alumni Event Mumbai (India) 25-nov
- **NFP/NICHE** Alumni Event Havana (Cuba) 8-dec

Cutting-edge Education for alumni: The Use of Sentinel-2 for Mapping Essential Biodiversity Variables

Roshanak Darvishzadeh r.darvish@utwente.nl

Biodiversity conservation and management of natural resources is a major concern in Africa where population growth is high and is also a major source of income for the country if properly utilized. The new generation of satellite images such as Sentinel- 2 images are crucial for monitoring vegetation traits particularly those, which have been recognized as essential biodiversity variables. A Nuffic refresher course on "mapping and monitoring vegetation using Sentinel 2 images" involving 20 participants from 10 different African countries was held in November 2016 at CSIR, South Africa.

The course provided an opportunity for learning, discussion, practical field experiments and exercises, on vegetation and their essential parameters in South Africa with the use of Sentinel-2 images.
The course focused on the analysis and interpretation of plant essential biodiversity variables using different retrieval methods from these images. The course participants attended a field work where they were trained to plan the sampling design, sampling of vegetation traits and collect relevant field data for validation of Sentinel data. The course further, promoted the public awareness on biodiversity conservation and further strengthened protected area management in the African region.

The refresher course which elaborated the utilization of the Sentinel-2 images for mapping and monitoring vegetation and their essential parameters had improved the alumni capacity in using new images, protocols and methodologies for sustainable natural resource management, biodiversity conservation, food production assessment and environmental studies in the region.

Coinciding with the refresher course, we had the pleasure in inviting ITC alumni to attend an informal alumni gathering to get the opportunity to meet old friends and make contact with new friends and fellow ITC alumni. The ITC Alumni gathering was held on Thursday 23 November 2016. The gathering was organized at The Blue Crane Restaurant, a cozy cafe in Pretoria, South Africa.

Apart from exchanging pleasantries, the alumni discussed the various issues regarding further interactions and future cooperation such as contributing in the Sentinel validation team activities.

The first secretary of the Dutch embassy in South Africa, Mr. Jan Huesken joined this gathering and gave a speech.
Jan Huesken is an ITC alumni himself. This was very interesting and nice for the African alumni community to know. The CSIR was represented by Dr. Moses Cho and Dr. Abel Ramoelo and ITC was represented by Dr. Roshanak Darvishzadeh, Prof. Andrew Skidmore and Dr. Tiejun Wang. ■

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- ✔ Cartography
- ✔ Climate Change
- ✔ Computing in the Cloud
- ✔ Crime Mapping/ Modelling
- ✔ Data Capture/Collection
- ✔ DEM- Digital Elevation Model
- ✔ DGPS - Differential GPS
- ✔ Digital City Models
- ✔ Digital Mapping
- ✔ Digital Rights Management
- ✔ Disaster Management/ Monitoring
- ✔ DSM - Digital Surface Model
- ✔ DTM - Digital Terrain Model
- ✔ Dynamic Mapping
- ✔ Earth Observation
- ✔ Emergency Services
- ✔ ENC - Electronic Navigation Chart
- ✔ Environmental Monitoring
- ✔ Galileo
- ✔ Geo-ICT
- ✔ Geodesy
- ✔ Georeferencing
- ✔ Geosciences
- ✔ Geospatial Image Processing
- ✔ GIS
- ✔ GIS in Agriculture & Forestry
- ✔ GLONASS
- ✔ GMES
- ✔ GNSS
- ✔ GPS
- ✔ GSDI
- ✔ Hardware
- ✔ Hydrography
- ✔ Hyperspectral Imaging
- ✔ Image Analysis
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- ✔ Integration
- ✔ Interoperability & Open Standards
- ✔ Land Information Systems
- ✔ Laser Scanning
- ✔ LBS
- ✔ LiDAR
- ✔ Mapping Software
- ✔ Marine Tracking & Navigation
- ✔ Mobile GIS/Mapping
- ✔ Municipal GIS
- ✔ Navigation
- ✔ Network Topology
- ✔ NSDI
- ✔ Open GIS
- ✔ Photogrammetric
- ✔ Photogrammetry
- ✔ Point Clouds
- ✔ Property Information Systems
- ✔ Radio Navigation
- ✔ Remote Sensing
- ✔ Risk Management
- ✔ RTK (Real Time Kinematic) Surveying
- ✔ Satellite Imagery/Navigation
- ✔ Scanning Technology
- ✔ SDI - Spatial Data Infrastructures
- ✔ Smart Grids
- ✔ Software
- ✔ Surveying Instrumentation
- ✔ Surveying Technology Sensor
- ✔ Telematics
- ✔ Topographic Mapping
- ✔ Total Station
- ✔ Tracking & Route Planning
- ✔ Transport
- ✔ Utilities GIS
- ✔ Vehicle Tracking & Navigation
- ✔ VRS - Virtual Reference Station
- ✔ Web Mapping

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