NewsLetter

ISPRS Student Consortium

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Interview with
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Zamani Project
African Cultural Heritage Documantation

Geospatial Data Mining

isprs

ISPRS SC NewsLetter

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SC Newsletter is at a stage where getting broader and better demands more people to be involved in the process of it's formation. That's why SC Newsletter team is looking for the following volunteers:

- More **people who would be willing to prepare articles** for existing or new rubrics,
- Designers of Newsletter

If you can help us with any of the above, please let us know!

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And also...
If you **would like to publish your research work** in the SC Newsletter send us your abstract on email written above. We will soon contact you for further information.

Dear ISPRS SC Newsletter readers,

We are entering the season of Summer Schools. Although only the names of our main events will be summerlike, we will try to make them both as memorable as the sweetest summer memory. (Or we could defend the name and say that the average between southern hemisphere spring and northern hemisphere autumn could be called global summer). First, the 9th SC Summer School for students and young professionals will be held in Bali, Indonesia, from 25th to 30th of October, just after the 34th ACRS. Almost at the same time, the 10th SC Summer School will take place in Addis Ababa, Ethiopia, just before the Africa GIS conference, and will last from 29th of October to 2nd of November. The current number of registered participants is astonishing and again, both events will most probably be unique in program and style. In these two summer schools on two different continents, around 100 students will be listening to interesting classes led by well-known professors, going on field trips and technical visits, and attending social events; and we hope all will gain a lot of new acquaintances and connections.

Because this version of the SC Newsletter will be printed and distributed to people attending any of the above mentioned events, we have dedicated this issue to both happenings and will try to sum up some of the impressions from both regions. For all those readers who will not attend either of the two Summer Schools, we promise we will inform you about what is going on there as it happens via our social media platforms and we promise that all new material from both events will be waiting for you on our web page soon after the events finish. And for all those who will attend any of two summer schools - take the best from these events and do not forget they are organized for you! And most importantly: enjoy!

Urša Kanjir,
ISPRS SC Chair

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JOIN US!!!

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by Chao-Yuan Lo

Dr. Dewayany Sutrisno

Indonesian Society For Remote Sensing (ISRS/MAPIN) President/ ACRS 2013 Chairperson
The director of the 9th ISPRS Student Consortium & WG VI/5 Summer School

Could you briefly introduce your professional career path?

My name is Dewayany Sutrisno, PhD and I am a senior spatial information researcher. I studied remote sensing as an undergraduate at Bogor Agricultural University. After that I continued my remote sensing studies at the University of New South Wales, Australia, and then came back to my university to study marine management using remote sensing, GIS and modeling, which is the expertise that I share with students now. Beside my status as a researcher, I am also an invited lecturer at Bogor Agricultural University, where I can meet students and young professionals.

As the local organizers of Bali SS, could you give us some motivations based on your professions point of view?

I realized the importance of remote sensing the first time I looked at aerial photographs in an undergraduate class. The world is too big to observe and map just with a terrestrial approach. Through remote sensing, we can feel as if the world and its contents are in our hands. We can go around the world, getting to know each other through remote sensing. As an Indonesian scientist who lives in the archipelagic state and uses spatial information in my professional career, I think that remote sensing tools provide the best way to map, to learn, to exercise, to analyze and to give input to our decision makers for the development and planning that hopefully will give us a better life. These are things that I hope will be the same for the students. Remote sensing is a technology with which all of the earth sciences or any people who like nature will fall in love.

How important is it for students to take part in this international event?

Youth is our future. Remote sensing technology is also our future. We live in the world that is also our future. Inviting students to this international event will broaden their communication with other young professionals all around the world, advance their knowledge, and help them appreciate differences amongst themselves. Hopefully the similarity of interests that arise from this international socializing will make them live in harmony and manage the world better in the future.

What kind of achievements will you expect of Bali SS?

We hope through this SS:

- More young people will become interested in remote sensing
- More scientific innovation will be developed
- More friendship and cooperation will be formed
- And, last but not least, bring harmony into the world through the advance of friendships in remote sensing.

Interview
by Chao-Yuan Lo

Dr. Hussein Farah

Director General RCMRD
The director of the 10th ISPRS Student Consortium & WG VI/5 Summer School

Could you briefly introduce your professional career path?

I am a land surveyor by profession. I studied surveying, photogrammetry, geography and water resource survey using remote sensing at different universities in Kenya, Canada and the Netherlands. I worked with the Kenya National Mapping Agency as a senior surveyor for eight years, then joined Moi University in Kenya as a researcher and senior lecture for twelve years. I am currently the Director General of a regional mapping organization serving nineteen countries in Africa. I have been in this position for four years now.

As the local organizers of Addis Ababa SS, could you give us some motivations based on your professions point of view?

The Summer school will help the participants to appreciate and be interested in the applications of remote sensing sciences to solving challenges facing the world and in particular Africa such as environmental degradation, food security and disasters. It will also help students from different backgrounds and countries to know each and form networks and communities that can share common interest and experiences.

According to your perspective, how important is the youths joining How important is it for students to take part in this international event?

Youth are the leaders of tomorrow who will lead science and the different professions. We must prepare, expose and excite students from environmental and earth science backgrounds about remote sensing science and its applications so that they can move forward and advance remote sensing sciences and the mapping profession in the next generations to come.

What kind of achievements of Addis Ababa SS will you expect?

There will a number of achievements. The most important one is to increase the number of future professionals who will work in the area of remote sensing and use it to solve practical problems facing our societies. Currently few students in Africa are studying remote sensing related and therefore every effort must be made to increase their numbers.

The Zamani initiative - an African Cultural Heritage Documentation Project

Prof. Heinz Ruther
Department of Geomatics, University of Cape Town

Many of Africa's cultural heritage sites are under threat from direct or indirect human impact in the form of uncontrolled development, civil unrest, climate change and unmanaged tourism, as well as environmental hazards and natural disasters. This is in addition to the natural aging processes of building materials, invading vegetation and the lack of funding for conservation and restoration.

Recent developments in spatial data acquisition instrumentation and methods have made it possible to spatially document cultural heritage sites with high precision and authenticity. Heritage sites can benefit from such documentation in the form of Geographic Information Systems, maps, diagrams, elevation and ground plans and especially geo-referenced 3D computer models of structures and terrain. The 3D models, in conjunction with freely available 3D viewing software, can be used by researchers and conservators as well as non-technical staff to visualize details of sites in 3D, plan conservation interventions or as interactive displays in tourist centres.

" 40 African Sites
100< Structures
15 Counties "

The African Cultural Heritage Sites and Landscapes Database, developed by the Zamani research group within the Geomatics Division of the University of Cape Town in South Africa, was created in response to these needs and aims to capture spatial information to create permanent records of African heritage sites for restoration and conservation purposes and to serve as a record for future generations. In addition the project seeks to provide material for education, research and site management and to increase international and national awareness of the importance of African heritage. The Zamani initiative was conceptualized by Professor Heinz Rüther in 2001.

To date, some 40 African sites with well over 100 structures in 15 Countries have been documented successfully by the team.

Among the documented sites are the Great Mosques of Djenne; the Djingareyber Mosque of Timbuktu and the rock hewn churches of Lalibela; rock shelters with rock art in Uganda and in the Drakensberg and Cederberg mountains in South Africa; the Swahili sites of Gede, Lamu, Kilwa and Songo Mnara; and the Musawwarat-es-Sufra temple complex in Sudan. All sites are scanned with a resolution of 1 – 3 cm for structures and 0.5 to 1 m for terrain. This results in huge datasets such as 7 billion surface points for the St Sebastian Fortress on Mozambique Island and the churches of Lalibela and close to 20 billion points for the structures and the terrain in Petra, Jordan. At the beginning of the project, sites were recorded with a few hundred setups while more recent projects are based on between 1000 and 2000 instrument set-ups. In response to the tendency to view archaeological and historical sites in the context of their environment, not only 3D models of buildings but also of the surrounding terrain are documented by fusing terrestrial scanning with DTM derived from aerial photography or airborne scanning. In a somewhat different application of the same technology, the entire Valley of the Queens in Luxor was documented by the Zamani team for the Getty Conservation Institute. The 3D model of the valley was required for the design of flood mitigation measures. Local conditions prohibited the use of aerial data acquisition method and the model of the valley was generated, in much detail, based on terrestrial scans only.

Textured 3D model of Al Kazneh-The Treasury- in Petra

Each of the documented sites is covered by numerous photographic panoramas, typically 50 to 100 and in some cases more, per site and these are combined into panorama tours. Flythrough videos of selected structures are rendered from the 3D models. These can be found on the website www.zamaniproject.org and on Youtube.com under the keyword "zamaniproject". Improved Structure-from-Motion software has recently added this technology to the toolbox of the Zamani team, where it is primarily used for texturing.

The completed models are used to produce sections, diagrams and ground plans and a GIS for each site combines the various data types. Extensive metadata with information about the technical details of individual scans, panoramas, photographs and GPS reference points are incorporated into the data base.

Un-textured model of a Swahili Palace in Gede, Kenya

The Zamani project owns the Leica HDS 3000, one of the early time-of-flight scanThe Zamani project owns a Leica HDS 3000, one of the early time-of-flight scanners, which after eight years of flawless operation is still fully functional and provides excellent results. However, technological advances in scanning technology have resulted in the group turning to the new generation of fast scanners. Over the past eight years, Leica Geosystems, Trimble, Faro and Z+F have generously provided scanners on short loans for individual documentation projects. Evidence of the dramatic advance in scanning technology becomes obvious when comparing the field performances of the early time-of-flight instrument with the latest phase based Z+F scanner, the Imager 5010C. In 2005 the team completed an average of 10 to 12 full dome scans per day with a resolution of 2cm over 20 m. Recently the same team acquired 80 scans in a day of scanning under similar conditions with the same or higher resolution including full HDR photography. On a complex site which required set ups at close distances, a new daily "team record" of 161 full dome scans was achieved and only empty batteries prevented an even higher record. However, this was without taking photography.

Similar developments can be noted in data processing. During the first years of scanning, a day in the field required five to ten days of subsequent processing. Now the introduction of automated registration has reduced the processing time. During the recent documentation of one of the castles of the UNESCO world heritage site listed as "Forts and Castles, Volta, Greater Accra, Central and Western Regions" in Ghana, it took only one day to scan a significant part of the castle from 130 scan positions and create a preliminary textured model based on automated registration and HDR software. However, completion of the models still requires fine registration and significant time is required for cleaning unwanted objects from the scans.

During the Ghana project, first experiments with a multi-rotor unmanned aerial vehicle for the acquisition of aerial images were also carried out. It is intended to use this UAV platform as a means of acquiring detailed aerial imagery for modelling roof detail in regions where terrestrial data acquisition is not feasible.

One of the most challenging projects undertaken by Zamani is the documentation of the UNESCO World Heritage site of Petra. The rockhewn tombs, tricliniums and dwellings of Petra, as well as its freestanding palaces, colonnades and temples have already been partly destroyed by catastrophic earthquakes and floods. Natural weathering causes further slow destruction and the more than 2000 tourists visiting Petra on average every day add a further destructive element. This makes documentation essential and the UCT team was tasked with scanning and photogrammetrically recording the 1.2 km long access canyon to Petra as well as the most important architectural structures in Wadi Musa and Wadi Farasa, the two principal valleys. This resulted in the largest point cloud and the most complex model generated by the project to date. The data will be used for a variety of applications, such as slope stabilisation and for a virtual tour through Petra.

One of Zamani's field campaigns planned for early 2014 focusses on Timbuktu and Gao in Mali. Mali's heritage is under severe threat and some irreplaceable tombs and documents have already been completely destroyed or damaged as a result of recent war, invasions and terrorism. The only remaining records of these sites exist in the form of photographs and verbal descriptions. The Zamani project therefore took the initiative to solicit funding for documentation work in Mali and it is intended to scan and document the Sangkore mosque in Timbuktu, the Tomb of Askia in Gao and whatever other historically relevant buildings can be recorded in the region within the limitations of the budget. It is also intended to create a Mali Heritage GIS for a risk assessment.

Besides the creation of geo-spatial data Zamani also contributes to capacity build-

ing in Africa through the presentation of workshops and by inviting local students to participate in field campaigns.

3D Model of Ashanti Shrine near Kumasi, Ghana

The Zamani initiative was first funded through a number of sequential grants from the Andrew W. Mellon Foundation. The project developed out of a long history of heritage documentation in the Geomatics Division reaching from conventional mapping of archaeological sites in the early stages of the project to advanced digital modelling of complex sites in its present phase. Currently the project is funded through the independent "Zamani African Cultural Heritage Sites Trust", which was established by a philanthropist when Mellon funding was exhausted. Documentation projects are also funded through the research grants of individual archaeologists and historians from institutions such as Rice University, York University, Toronto, Humboldt University, Berlin, Bowdoin College, and the University of Toronto. This not-for-profit group also works on projects for UNESCO, the World Monuments Fund and the Getty Conservation Institute. There are still numerous African heritage sites which are in desperate need of documentation and attempts are underway to solicit further funding to allow the group's work to continue.

The Zamani team is comprised of the Principal Investigator, three Scientific Officers and six to eight international interns who join the team every year for six-month periods. International and local postgraduate student also participate in the Zamani project and international academics regularly visit the group. **Students interested in joining the team as interns can contact Heinz.ruther@uct.ac.za**.

Blue Diamond on the Plateau Remembering of field experiments at Qinghai Lake

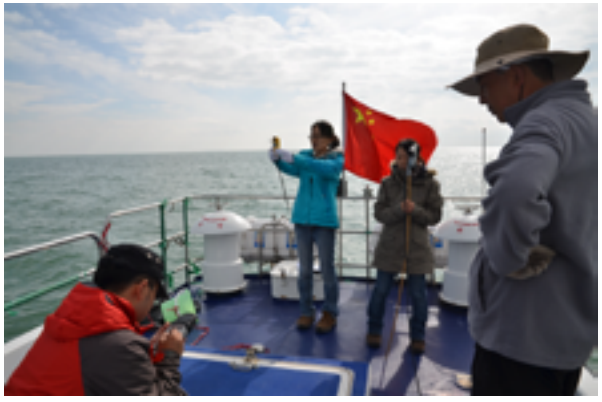
Heng-Qian Zhao

Qinghai Lake, the biggest salt lake in China, has always been a dream which is too far away for me to reach. In my mind, it is very big, and bicycle enthusiasts enjoy cycling around it. This summer, due to the needs of research, I got the chance to go to this dream place for six days of field experiments at Qinghai Lake. Although the schedule was very tight, and we had to carry out the experiment for at least five whole days, I was still very excited to see the big lake.

First we arrived at Xining, which is the provincial capital city of Qinghai. When the plane took off from Beijing, the outdoor temperature was around 36 ^{o}C, where I felt like a roast duck. But when I stepped out of the plane, a cold breeze hit me, and I shivered in spite of myself. As the altitude of Xining is above 2700m, the temperature there is much lower than the east of China - no wonder it is called the Summer Paradise! I was worried about altitude sickness, but this fear seemed unfounded, because I had a really sound sleep the first night at Qinghai.

After purchasing some materials, we set out for Qinghai Lake the next morning. It took around three hours to get to our destination, but I didn't close my eyes for a second, because the scenery along the trip was so beautiful! Growing up in a big city, I had never seen such vast land in my life! Fresh air, clear streams, grasslands to the edge of sky - I felt like a free bird flying in the sky! Our driver was a local person who proudly introduced the places we passed, and we enjoyed listening to his vivid stories.

"Look, there it is!" the driver pointed out the left window. Under the golden sunlight, the big lake was shining and fused together with the blue sky! Seeing that rape flowers were yellowing the fields, we shouted to get out of the car to take pictures! The driver laughed, calmed us down, and promised us a bigger surprise. Then he drove us halfway up the mountain, and when we looked out of the window, we were dumbfounded by what we saw. The surface of Qinghai Lake was as smooth as a mirror, its blue color was crystal and charming, and only one thing in the world could compare with it - the blue diamond on a crown, such as Heart of the Ocean in "Titanic"! Closing my eyes, I was utterly ravished in the breeze…



In the following days, we fought with the big waves on the lake, went on long expeditions with heavy spectrometers on our back, organized large quantities of data until late at night, and endured difficulty in breathing and poor sleep due to altitude sickness…But I never regretted joining this experimental trip. If you never go out and stay indoors all the time, you cannot imagine what splendid scenery you might have missed.

The sight of this blue diamond will never fade in my mind.

Report on Aerospace Futures 2013

by John Furness

Aerospace Futures 2013 was held in Adelaide, Australia in early July. The annual national event of the Australian Youth Aerospace Association hosted nearly one hundred delegates from across the nation and featured a comprehensive speaker program of presentations from around the world. Aerospace Futures has been running for four years and has been hosted in Australian cities such as Brisbane, Sydney, and Melbourne. The conference is aimed at undergraduates and young professionals and aims to give delegates an insight into local and international developments in the aerospace industry and facilitate networking amongst delegates and speakers.

Aerospace Futures was planned during a myriad of other space activities taking place in Adelaide, including the Australian Space Development Conference, which focuses on policy and commercial development. Other public events included presentations regarding the exciting Scramspace scramjet project and the Space Industry Association of Australia's Inaugural Distinguished Lecture featuring Dr. Yasushi Horikawa, Chair of UNCOPUOS. The conference is also surrounded by social and networking events such as the Official Launch Night and an industry sponsored cocktail event.

The three day speaker program was rich, exciting, and included five speakers via teleconference. Presentations covered off-Earth mining, remote sensing, telecommunications, aircraft structures & maintenance, commercial spaceflight, purchase of Australia's new air combat capability, real air crash investigations, unmanned aerial vehicles, opportunities in postgraduate research, and more. Most topical was discussion regarding the recent release of Australia's Satellite Utilisation Policy (http://www.space.gov.au/SpacePolicyUnit).

Aerospace Futures is an unparalleled opportunity for young people and prospective leaders making their way into the aerospace industry. Why not check it out and find out more?

Dr. Horikawa presenting to delegates

Ayaa.com.au
Facebook.com/AeroFutures

Geospatial Data Mining and its Contribution to Spatial Information Sciences

by Thanasis Moysiadis
Department of Planning and Regional Development, University of Thessaly

The term "Data Mining", (sometimes known as "Knowledge Discovery"), appeared around 1990 in the database community and although it is a relatively new term, this is not the case with the technology it describes. It has become an active area of research since it combines methodologies from database management, statistics, machine learning, high-performance computing and information retrieval [1], [2]. The goal of data mining is the process of analysing data from different perspectives in order to extract useful information, patterns and trends that were previously unknown and then transform it into an understandable structure for further use [3].

From a technical point of view, data mining is the process of finding correlations or patterns among many fields in large relational databases. Apart from the raw analysis step, it involves database and data management aspects, data pre-processing, model and inference considerations, complexity considerations, post-processing of discovered structures, visualisation and online updating [4]. The actual data mining task is the automatic or semi-automatic analysis of large quantities of data to extract previously unknown interesting patterns such as groups of data records (cluster analysis), unusual records (anomaly detection), and dependencies (association rule mining).

Geospatial data mining is a subcategory of data mining aimed at discovering patterns in geospatial databases. This typically requires powerful software with a number of analytical tools with respect to the geospatial application. It allows users to analyse data from many different dimensions or angles, categorize it and summarize the relationships identified. Typical geospatial operations include: length, area, overlap and intersection. Spatial Information Sciences such as the GIS have employed relational database management systems for years and more recently they have begun to use object-relational database management systems [2].

Traditional data mining techniques applied to geospatial data can result in patterns that are biased or that do not fit the data. Moreover, geospatial datasets are large and the data mining techniques may be quite complex. Chawla and Shekhar [5] highlight three reasons that geospatial data pose new challenges to data mining tasks. Classical data mining deals with numerical and categorical variables, whereas spatial data is more complex and includes extended objects such as points, lines and polygons. Another difference is that classical data mining works with explicit inputs, whereas spatial predicates (e.g. overlap) are often implicit. The third reason is that classical data mining treats each input as independent of other inputs, whereas spatial patterns often exhibit continuity and high autocorrelation with nearby features.

According to Gunopulos [1], there are two different modes of interaction in data mining. The "Exploratory Data Mining" includes the forming and testing of a hypothesis, the data query and the understanding of the data structure, whereas the "Batched Data Mining" includes such goals of the data mining process as clustering, classification outlier detection, feature similarity, spatial association rules and trend detection. Four of the most common geospatial data mining tasks are: clustering, classification, association rules and outlier detection [2].

"Clustering" attempts to identify natural clusters in a dataset. It does this by partitioning the entities in the data such that each partition consists of entities that are close (or similar), according to some distance (similarity) function based on entity attributes. Whereas clustering is based on analysis of similarities and differences among entities, "classification" constructs a model based on inferences drawn from data on available entities and uses it to make predictions about other entities. Various classification methods have been developed in machine learning, statistics, databases and neural networks; one of the most successful is decision trees. "Association rules" attempt to find correlations (actually, frequent co-occurrences) among data. Spatial association rules include spatial predicates such as topological, distance, or directional relations in the precedent or antecedent [6]. "Outlier detection" involves identifying data items that are non typical or unusua. The representation of the geospatial data in the outlier analysis remains a difficult problem.

In all, data mining is quite a difficult and complex field of research. With reference to geospatial data especially, it is almost impossible to say with certainty that a particular technique will always be effective in problem solving. A high level of expertise and experience is required to analyse and interpret the vast amount of geospatial data being captured, in order to reach a reliable and validated outcome.

credits:http://www.educationaldatamining.org

References

1. Gunopulos, D. Data Mining Techniques for Geospatial Applications, White paper, prepared for a Committee of the Computer Science and Telecommunications Board.
2. Committee on Intersections Between Geospatial Information and Information Technology, National Research Council, 2003. IT Roadmap to a Geospatial Future, Chapter 3, Geospatial Databases and Data Mining, National Academies Press, 136 pages.
3. Hand, D., Mannila, H. and Smyth, P., 2001. Principles of Data Mining. MIT Press, Cambridge, 584 pages.
4. Knowledge Discovery in Data Special Interest Group/SIG of the Association for Computing Machinery, http://www.sigkdd.org
5. Chawla, S. and Shekhar, S. 2001. Modeling Spatial Dependencies for Mining Geospatial Data: An Introduction, Geographic data mining and Knowledge Discovery (GKD) Conference.
6. Miller, H.J., and Han, J, (eds.), 2001. Geographic Data Mining and Knowledge Discovery, Taylor & Francis, London.

The first Satellite Imagery contest for ISPRS Student Consortium Members

by Elena Lobo

This year, ISPRS SC held its first Satellite Imagery contest, through which Student Consortium members sent their proposals for use of satellite imagery in different applications and had a chance to receive satellite images from DMCii to use in their research.

High quality proposals were submitted by ISPRS SC members, with a wide range of applications for DMCii imagery. After careful evaluation of all submitted proposals, the following winners were selected:

- Riccardo Tortini from Michigan Technological University is using DMCii and Landsat imagery to detect and quantify harvesting of forests in the Western Upper Peninsula of Michigan (USA).
- Fabian Enβle from the University of Freiburg is using DMCii and Landsat images to detect changes in forest cover in the Democratic Republic of Congo (DRC) within the EU funded ReCover project.
- Shridhar D Jawak from the National Centre for Antarctic and Ocean Research is working on mapping Polar Regions to gain a better understanding of the dynamic processes of seasonal snow cover and assess its response to global warming.
- Ram Avtar from the United Nations University in Japan is using DMCii satellite images of Sri Lanka to monitor changes in vegetation as an indicator of changes in its groundwater, which plays a critical role in agricultural production.
- Kuan-Hsun Cho from the National Chiao Tung University in Taiwan is looking at cloud detection over Taiwan. DMC satellites' very wide 650km imaging area allow the whole of Taiwan to be imaged in just one pass. By compiling a sequence of images of the same location over a short period of time, the project will detect and remove cloud cover to compile a complete, cloudless image of the island.

The contest winners have received all the requested images and are now hard at work on their projects. We hope this will be the first of a series of similar contests, and we are looking forward to seeing the results of the ground-breaking work that ISPRS SC members are developing.

The Indirect Path

by Adam Benjamin

The geospatial sciences are very much a discovered career path in the United States. Geospatial professional is not an occupation that is at the forefront of young students' minds when selecting an undergraduate college major or picking courses based on future employment opportunities. Students gravitate towards medicine, law and business. This trend toward high paying, rewarding careers is natural. However, there are many people, especially here in the United States, who would enjoy a career as a photogrammetrist, remote sensing specialist, surveyor, or GIS professional but who have never been or never will be exposed to these rewarding professions. Fortunately for myself, after a very circuitous route, I was able to find the geospatial sciences.

As an undergraduate student, I graduated with a degree in mathematics and a minor in economics from Elon University in North Carolina. I was set on joining the ranks of the mathematical finance profession. Shortly before entering graduate school for this career path, I had a change of heart. I returned to my native Rhode Island and was intent on getting into the real estate profession. I tried my hand as both a real estate buyer's agent and a mortgage office assistant in South Florida. Both opportunities came to a screeching halt when repeated hurricanes slammed the state of Florida in the fall of 2005.

I returned to Rhode Island to regroup and find my next opportunity. I was fortunate to find this opportunity at a small civil engineering and surveying firm where my job was a mix of office and field work. Searching chain of title at the town halls, mapping coastal parcels for land development, and designing sewage treatment systems for our clients was a rewarding endeavor that I wanted to continue to pursue. The Great Recession of 2009 led to a slowdown at the office but it also delivered an opportunity to attend graduate school in my found career path, geospatial science.

Given that the United States has limited educational venues in surveying and mapping, I felt very fortunate to receive an assistantship for a Master of Science degree in Geomatics at the University of Florida in Gainesville, Florida, especially in light of the economic times. My graduate assistantship provided hands-on experience with a variety of topics including LiDAR, inertial navigation, mobile mapping, unmanned aerial vehicles, and photogrammetry that I had only previously read about in trade publications. I knew that this was the profession for me.

Since graduation in 2011, my journey has taken me to the University of Florida Fort Lauderdale Research and Education Center about five hours' drive away from the main campus in Gainesville. As the Geomatics Specialist, I teach Geomatics courses, collaborate on geospatial research, advise students, develop Geomatics distance education curriculum, and promote the geospatial profession through community outreach. My research interests continue to evolve as my current PhD program research emphasizes the use of LiDAR in coastal science. My affinity for the ocean has been combined with the rapidly evolving technologies of our profession.

As a fellow student member of the ISPRS Student Consortium, I attended the ISPRS Summer School in Fayetteville, North Carolina in the summer of 2011. At the 2011 summer school, I was glad to be invited to participate in the ASPRS Student Advisory Council. For two years, I had the privilege of working with a great group of students from the U.S. and Canada as the Deputy Chair and then Chair of the National ASPRS Student Advisory Council. I have met an extraordinary group of people through my activities over this just concluded position. I would encourage anyone who has the opportunity to volunteer at a conference, to participate on a council, or to form a geospatial student group to do so. The rewards from your efforts will more than offset the time spent on these activities.

Like many of you, my career trajectory has been a very indirect path. However, I would not change the experiences along the way as they have helped me appreciate where I have come from and where I may be going next.

Exchange Story from Florida's Sunshine City St. Petersburg

By Mustafa Ustuner
Yildiz Technical University, Turkey

I'm a master student working as a research/teaching assistant in the Geomatic Engineering Department at Yildiz Technical University in Turkey since 2011. Last year, one of my colleagues informed me of a scholarship given by the Turkish Government to graduate students working as research assistants at Turkish universities/colleges to conduct research as part of their master's thesis. While I was deciding which university to apply to, professor Dr.Ayazli from Cumhuriyet University suggested that I conduct research in the USA. So I made a list of professors in the USA who had a research laboratory where they could host me and the projects I could be involved in. They were from different departments and backgrounds such as electronics, geomatics, computer sciences, urban planning, geography, biology and environmental sciences. I wanted to choose the one best matching my research and interests. The topic I am currently interested in is the different applications of machine learning algorithms to remote sensing data (optical, SAR, LIDAR, etc.) analysis in many domains such as environmental and economical issues. Therefore I applied to the University of South Florida, St. Petersburg (USFSP) to study with Professor Dixon. I was accepted there as a visiting scholar at USFSP's Geospatial Analytics Lab from May to June 2013. Now, I can easily say that I made the right choice.

In this laboratory, there is a research group comprised of research assistants and graduate students coming from different perspectives and different countries. They work regularly with key government agencies such as U.S. Geological Survey, the Florida Marine Research Institute, and others, in data gathering and analysis pertaining to key environmental issues in their region. Furthermore, they have completed many research projects with NASA, EPA and USGS, such as prediction of ground water vulnerability, soil moisture mapping, different applications of machine learning algorithms and much more. I concentrated my research on the analysis of machine learning tools for classification of remotely sensed data. This helped me to enhance my thesis. Furthermore, this research enriched my academic skills and helped me understand different points of view while doing research and writing a scientific paper.

Imagine vast, endless beaches where you can swim almost every day. What city would have these beautiful beaches and palm trees? Yes, this is St. Petersburg, FL! When you first hear the name of this city, it is quite normal to guess it is in Russia. However, it is in the Sunshine State of Florida, in the southeastern region of the USA. It is known as "Florida's Sunshine City" and is famous for the "St.Pete Beaches". I'm sure that Miami first came to your mind when you think of Florida since that city is famous for nightlife and its beaches as well.

Can you imagine I got the opportunity to study in such a place? This is why I would like to share my research experience at University of South Florida, St. Petersburg (USFSP). It was such a long flight from Istanbul to Florida, about sixteen hours. The USFSP has a spectacular campus nestled on the waterfront in the city center. It was like a small family welcoming you with its friendly and helpful students and staff. Perhaps because of the balmy weather or the relaxing city atmosphere, the people living there are mostly smiling and happy. This city is also one of the most bicycle friendly cities of the USA, which is why I usually biked to school. This sunshine city gave me the opportunity of meeting new people with different perspectives and learning something new about their culture and lifestyle.

To sum up, everything was totally awesome during the time I spent at USFSP and I am glad to have had such kind company during my two months there. I strongly encourage anyone to see or visit this city and university .My special appreciations go to my supervisors Dr. Sanli and Dr. Dixon for their guidance throughout my research; my friends Dr. Kazar from Oracle and Dr. Akkus from University of Memphis, and Veronica, Paula, and Kat for their help regarding some issues in the USA. Furthermore I would also like to thank my friends Dr. Unal, Zeynep, Kadife, Michele, Camielle, Jordan, Mark, Steven, Christa and Jason from USFSP for their warm welcome and good company.

Indonesia - Bali

Bali is one of more than 17,000 islands in the Indonesian archipelago, also known as The Island of the Gods. It is also called as the 'Last Paradise on Earth' and is the most popular tourist destination in the world. Spectacular beaches with great surfing and diving, varied landscape of hills and mountains, deeply spiritual and unique culture with combination of friendly and hospitable people 80% of Bali's economy depends on tourism.

Indonesia is a Muslim country, but the main religion in Bali is Hinduism and it is considered one of the largest outpost of Hindus outside of India. Be prepared to see temples everywhere you turn your head. In Bali they also have a different calendar that has its origins in the Hindu religion which consists of 10 weeks made of 10 days that has only 210 days.

Don't miss:

- Visit the incredibly stunning black volcanic sand beaches
- Eat Babi Guling - (traditional food) a local version of suckling pig
- Try some tropical fruits - snake fruit, pineapples, strawberry, apples, bananas of different grades, tangerines, papaya, wood apple, passion fruit, jackfruit
- Visit Mount Agung - highest mountain in Bali and the mother temple of Besakih which is also an active volcano and is believed to be the dwelling place of the Hindu gods
- Visit Bukit Peninsula - the southernmost tip of Bali, with world class surfing, great beaches, and the can't-miss cliff-hanging Uluwatu Temple
- Watch traditional dances - Barong or "lion dance", Calonarang, Kecak or "monkey dance", Legong Keraton
- Join a festival - There are an estimated 20,000 temples (pura) on the island, each of which holds festivals (odalan) at least twice yearly
- Try Kopi Luwak - coffee beans which have been eaten by the Asian Palm Civet, and then passed through its digestive system. It is the worlds most expansive coffee.

Enjoy Bali with its sunshine shining throughout the year, with pleasant day temperatures.

Ethiopia - Addis Ababa

Do you remember your childhood when your parents open up a book and began to read 'once upon a time ...', while you were tucked up in bed? You were taken to deserts made of gold, castles made out of crystal, places where women wore plates for jewelery, hynenas begging for titbits from the hands of men, emperars turning soil rock into churches, a queen known as Sheba seduced a king named Solomon... All those fairy tales took place in Ethiopia where our next summer school will be held.

This magical country is home to more than 80 million people speaking more than 80 languages. As the second-most populous nation in this continent, it is also the oldest independent country in Africa and the second-oldest official Christian nation in the world. Historians believe that Ethiopia may well be the beginning of mankind. The fossils of the oldest living mankind or "Lucy" was discovered in the the northern section of Ethiopia. Lucy, who is estimated to have lived 3.2 million years ago.

Addis Ababa is mentioned among the top 10 cities to visit by lonely planet. While in Addis Ababa don't miss:

- Ethiopian National Museum - a world-class museum with the replica of Lucy
- Red Terror Museum - learn about the horrors of the Derg that led to the well known famine of the 1990's
- Mercato - the largest outdoor market in the world (Don't forget to bargain)
- Shiromeda Market - Nicer alternative to mercato
- Eat injera - (traditional food) at least once. it is yeast-risen flat bread with a unique, slightly spongy texture
- Drink tej - the national drink of Ethiopia brewed from honey
- Drink tela - Ethiopian beer
- Drink & buy coffee - Ethiopia is where Coffea arabica, the coffee plant, originates.

Be careful while preparing your luggage for Addis Ababa. Everybody thinks that Africa is hot, but it's not always what people think of. Even though Addis Ababa was voted as the city with the best and the most stable weather in the world, be prepared for day and night time differences in temperatures.

If you have a few more days to stay in Ethiopia consider Lalibela (home to 11 astonishing rock-hewn churches), Aksum (home of ancient tombs and stelae fields), Gondar (some of East Africa's only castles), Simien mountains national park, Churches of Tigray, Lower Omo Valley and Harrar to see your childhood fairytales.

Referances: lonelyplanet, wikitravel and http://blog.villa-bali.com/2013/03/8-fun-facts-bali

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