

# NewsLetter

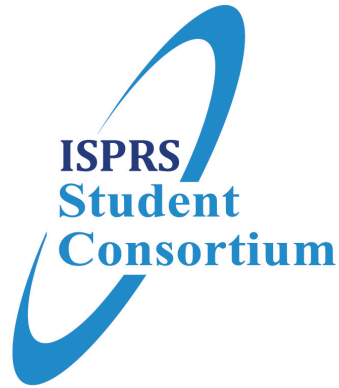
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**Interview with Dr. Liang-Chien Chen**  
**Taiwan - The Beautiful Island**  
**Environmental Monitoring**



# ISPRS SC NewsLetter



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Frontpage designed by Mitja Kroppe



Would you like to join SC Newsletter team? Do you want to make a difference? Want to learn new skills?

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,
- **English native speakers** for proof reading.

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

[info@isprs-studentconsortium.org](mailto:info@isprs-studentconsortium.org)

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 Follower,



The 6<sup>th</sup> ISPRS Summer School took place in North Carolina, the first SC Summer School in the North America Region. The highly international and regional participation in the event showed that the chosen topic drew attention of researchers and students from all around. In addition, there had been a great interaction between the participants and lecturers during the summer school as we had in previous schools. The synergy we have seen is one of the ultimate constant goals for ISPRS SC. We are glad to achieve this within the summer schools. The participations' evaluation survey results were full of positive thoughts and useful suggestions for the future events and we are glad to meet what was expected from us. You will find a report about the summer school in this issue. The digital teaching materials and more from the summer school can be downloaded from the website for the ones who hadn't had the chance to attend.

On the other side of the World, the preparations of the 7<sup>th</sup> ISPRS summer school in Jhongli, Taiwan are in the final stage. It is great to witness the interest in participating and organizing the summer schools from various communities of the society. The torch of science and education is travelling all around the world. You will find more about the region and the summer school in this issue.

In a short time, we will announce the Youth Activities during the ISPRS Congress Melbourne 2012 as we finalize the overall schedule with the Congress organising team. During this time you may think of your possible scientific and technical contributions to the Congress. I encourage you to submit an abstract of your technical research either as a digital poster or an oral paper application.

On Behalf of Student Consortium,  
Cemal Özgür KIVILCIM  
ISPRS SC Chair

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Let's Come Together  
to Make The World  
Smaller and Smaller,  
While Enlarging  
and  
Powering Our  
Student Consortium  
Network!!

**JOIN US!!!**

Interview

by Urša Kanjir

Dr. Liang-Chien Chen

**Liang-Chien Chen** is a professor in the Center for Space and Remote Sensing Research at National Central University. He has been with the Center for Space and Remote Sensing Research, National Central University, Jhongli, Taiwan, as an Associate Professor from 1986-1993 and full Professor from 1993 till now. He is currently in charge of the Satellite Ground Receiving Station, which is a major part of the satellite remote sensing infrastructure in Taiwan. His research activities are in the areas of digital photogrammetry, geometrical data processing for remotely sensed data, image feature extraction, three-dimensional object reconstruction, and cyber city modeling. He has received the distinguished professor award since 2006. Dr. Chen is the Chairman of the Academic Committee of the Chinese Taipei Society of Photogrammetry and Remote Sensing. He is member of editorial boards of photogrammetry and remote sensing related journals.

**Can you explain us what is your research field/professional work at the moment?**

I have been working on photogrammetry and geometric modeling for remotely sensed data for a quarter century. Images acquired from space, in air, and on the ground are in my interest. Lidar point clouds became my research target some ten years ago. Three dimensional reconstruction for terrain surface and building models belongs to my research core. Image corrections, including orthorectification and true orthorectification, are also included in my geometrical modeling. In addition, my recent research includes 3D change detection from multi-source remote sensing data for man-made buildings.

**Why did you decide for this profession in the first place (maybe you can tell us something more about your first steps)?**

I determined to devote to photogrammetry in my third year when I was a civil engineering student at National Chen Kung University (NCKU) of Taiwan. I recalled that my academic performances in “Photogrammetry-related” and “Structure-related” courses were very good and balanced. The background knowledge of these two different looking disciplines has one thing in common: geometry. Motivated by my professor, Dr. H.S. Shih, I made an important decision in terms of my profession

career. I’m really happy about what I decided decades ago. After graduation from NCKU, I worked as a surveying engineer for two years in a construction site of the first freeway in Taiwan. Then, I went to USA to pursue my academic career.

**In your opinion how important is participation of young people to international professional events like Summer schools, Congresses, workshops, etc? What do you think are the benefits of such activities to youth and to profession?**

I have never missed anyone of ISPRS Congresses since I first attended Kyoto Congress in 1988. In the six Congresses that I attended, I acquired the most direct, effective, complete, and the fastest information on field developments. Having had participated in many Inter-Congress Symposiums, I learned about the latest achievements and development trends from the research themes that I was interested in. Besides, I have never been absent from Asian Conference on Remote Sensing (ACRS) since I attended Manila ACRS in 1998. Furthermore, I had better understanding of the development of Asian Remote Sensing by hosting ACRS 2000 and ACRS2011.

In addition to ISPRS, I participated in many conferences which were held by IEEE, SPIE, and many others. In terms of knowledge acquirement and field

development perspective, participating in such congresses, conferences, summer schools, and workshops is much more efficient and effective than any other approaches. Meanwhile, we can know better about our professional prospect and development orientations in our fields accordingly.



**What advices would you give to students and young professionals regarding successful career?**

It is necessary to completely devote ourselves to the right direction. Here are some suggestions as follows:

- Passion is the main motive of lifelong learning which makes us enjoy working.
- Those engaged in Spatial Information should pay more attention to surroundings and environments, and should be keen observers.
- Solid learning foundation and strengthening basic abilities are helpful to lifelong learning.
- Try to equally activate both right and left parts of your brain to balance your logic thinking and creativity.

**“Passion is the main motive of lifelong learning which makes us enjoy working.”**

*See more on next page*

## Interview

**Can you tell us something about recent development of remote sensing and GIS in Asia? In which domain there is an emphasis at the moment?**

Asia is the world's largest and most populous continent. At the same time, Asia suffers the most serious and destructive natural disasters. Therefore, the disaster monitoring is the most important part of remote sensing and GIS to Asia. The multi-source remote sensing is indispensable for providing disaster monitoring in this region. Besides, of all global change issues, the remote sensing mission is a key point of monitoring environmental changes in Asian region. There are many advanced mega cities in Asia, which need smart technologies for their planning, design, construction, and management to build up a smart city. Of compositional elements of a smart city, the spatial information derived from photogrammetry, remote sensing and GIS is indispensable.

### Taiwan, The Beautiful Island

Taiwan, also called "Formosa" or "Beautiful Island" by the Portuguese in the 16th century, has numerous mountains, comfortable climate, and rich ecology. The relief of Taiwan is from 0 to 3,952 meters, and the top is Yushan Mountain. The forest coverage reaches 2/3 of this island and leads to beautiful natural scenes. So far, there are eight national parks such as the Taroko National Park, Yushan National Park, Shei-pa National Park, Yangmingshan National Park, Kenting National Park, Kinmen National Park, Dongsha Marine National Park, and Taijiang National Park. The diverse geographic surroundings also mean that Taiwan has a rich variety of plant and animal life, including some endangered and very special species that can be seen nowhere else.

Taiwan's multifaceted culture has a 5,000 years long history but has evolved into a distinct and democratic society. For enjoying the centennial history, the National Palace Museum, a well-known treasure trove of Chinese culture, is a good beginning. This museum has collected over 600,000 masterpieces of Chinese art and artifacts. You will experience a variety of local cultures like religious beliefs, folk festivals, and traditional skills. For example, the glove puppetry is one of the famous traditional Taiwanese performances and has been filmed to movies and serial programs.

The climate in Taiwan areas is variable because of the geographical location. During the past decades, many natural hazards have caused casualties, economic loss, landscape changes, etc. Therefore, environmental monitoring for hazard mitigation has become an important task. So far, we have integrated multi-sensor and multi-platform remote sensing data to achieve this objective. The most important sensor is the FORMOSAT-II satellite, which is capable of providing daily high-resolution and multi-spectral images for large-area monitoring. Moreover, there are also 7 airborne large-frame digital cameras and 6 airborne laser scanners in operation to extract detailed landscape and environmental information rapidly. One of the key components in Taiwan's Remote Sensing infrastructure is the Center for Space and Remote Sensing Research (CSPRS) in the National Central University (NCU). Not only does CSRSR receive and process multiple satellite data but also has accomplished many academic researches and applications since it was established in 1984. The National Central University is also honored to host the 7th ISPRS Student Consortium and WG VI/5 Summer School.



### The Contribution of Space Technologies to Environmental Monitoring

by Thanasis Moysiadis, University of Thessaly

The world is changing rapidly and the natural resources seem to deplete quickly. The use of space technology helps us monitor these changes, make predictions and even prevent them. It also helps us to use the natural resources in good effect, identify new resources and protect the existing ones from natural or human interference. Spatial information sciences cover the acquisition, integration, analysis, management and communication of spatial data to serve the needs of a social, economical and natural environment. A continuous, reliable and multidimensional monitoring of the earth surface, the oceans, the atmosphere and the environment, is required to acquire useful information.

By means of satellite remote sensing, environmental issues can be addressed to monitor regional and global changes, since data from inaccessible areas are collected. Since the launch of Landsat, a non-weather satellite, in 1972, to monitor the environment on earth, many satellite missions followed, to serve the same needs. Satellite imagery from both active and passive systems are used to monitor agricultural lands, predict and monitor physical disasters such as earthquakes, floods, pollution of the atmosphere and the oceans, snow distribution, water resources, land use and land cover. False colour images using the visible and infrared give differences of the environment being monitored. Amplifying these differences in order to be perceptible to the human eye, not only healthy from diseased vegetation is recorded, but also discrimination analysis of chlorophyll concentrations in plants and areas with different nutrient regimes. Synthetic Aperture Radar (SAR), as an active microwave sensor, it offers data regardless of the weather conditions or the time of the day. Crop fields are detected by pixel-based analysis, while, due to different polarization, crop fields and forest areas are easier to be distinguished. The strength of backscatter in a city area depends on the relationship between the buildings orientation with respect to the SAR microwave direction. Thus, strong reflections of buildings in city areas give accurate images of urban sprawl. Light detection and ranging (LIDAR), a form of active remote sensing, is often used to acquire topography information of inaccessible areas. It is also used to record forest lands in order to identify alien plant species by their canopies and the amount of ground plants that grow under them. Digital Surface Models (DSM) provides details of the surface of the earth, useful information of slides and other natural phenomena. Land cover change is on the most important application of remote sensing of the environment. Comparison of colour composites, classification maps, image of

differences and calculation of vegetation indices, give changes from forest to bare earth, changes in vegetation within a period of time, changes due to floods, land slides, drought as well as soil moisture and sea surface temperature.

Global initiatives such as the Global Monitoring for Environment and Security (GMES) and the Group on Earth Observations (GEO), supported by the European Commission, European National Institutions and international organisations, focus on coordinating international efforts to environmental monitoring. They provide solutions to the environmental monitoring and the management of natural resources, the climate change, the forest ecosystem, the marine environment and the human interference towards the natural environment.

GMES is a European Programme for the establishment of a European capacity for Earth Observation, a fully operational service programme to deliver information on the environment and the security which correspond to the user needs. Its services are based on Earth monitoring data, collected from space (satellites), air (airborne instruments, balloons to record stratosphere data, etc.), water (floats, shipboard instruments, etc.) or land (measuring stations, seismographs, etc.) to produce output information in the form of maps, datasets, reports and targeted alerts. GEO is a voluntary partnership of governments and international organizations, a Global Earth Observation System of Systems (GEOSS) to provide decision-support tools to a wide variety of users on the basis of a 10-Year Implementation Plan for the period 2005 to 2015. The Plan defines a vision statement for GEOSS, which addresses nine "Societal Benefit Areas" of critical importance to people and society. It aims to empower the international community, to protect itself against natural and human-induced disasters, understand the environmental sources of health hazards, manage energy resources, respond to climate change and its impacts, safeguard water resources, improve weather forecasts, manage ecosystems, promote sustainable agriculture and conserve biodiversity.

Environmental monitoring is essential for assessing the current state, the changes of the environment and its natural resources. The use of space technologies by means of satellite remote sensing, offers great potential towards this aim. If satellite imagery and derived information were more easily accessible and understandable to the general public, it would be a step further for environmental monitoring, from a local to a global level.

#### References:

1. Environment Agency, UK, <http://www.environment-agency.gov.uk>
2. Global Monitoring for Environment and Security (GMES), <http://www.gmes.info>
3. Group on Earth Observations (GEO), <http://www.earthobservations.org>
4. Jensen J. R., 2006. Remote Sensing of the Environment: An Earth Resource Perspective

### The 6<sup>th</sup> ISPRS SC Summer School

by Devin Bourland

The 6<sup>th</sup> ISPRS WG VI/5 and SC Summer School “Advanced LiDAR Processing and Applications” was held at Fayetteville State University from July 30 to August 6, 2011. Fifty three participants from 20 countries and 20 from US states attended this student-focused conference. This was the first ISPRS SC Summer School held in the United States.

Such ISPRS Summer Schools promote spatial sciences by providing an intensive week of training and other educational activities for students and young researchers in geospatial fields. In addition to learning theoretical concepts in lectures, the aim of summer schools is to demonstrate to its participants the practical and laboratory aspects of the science. Equally important is the social context of such meetings as they facilitate the exchange of ideas and provide a base for further international cooperation. During the summer school, the students travelled to Myrtle Beach, South Carolina for a day trip. It was a welcome break for everyone to leave the lecture hall behind and interact on a more personal level. The week-long event was packed with sessions and presentations from leaders in this field who came from Europe, Canada, and the United States. A special “thank you” goes out to the educational lecturers Dr. Norbert Pfeifer and Dr. Gottfried Mandlbauer (Vienna University of Technology), Dr. Nicholas Coops (University of British Columbia), Dr. Thomas Allen (East Carolina University), and Dr. Marguerite Madden (The University of Georgia) who collectively conducted 7 lectures and 3 lab exercise sessions. In addition to learning about the theory/application and working on laboratory exercises on LiDAR, students also had the opportunity to interact with industry specialists from Optech Incorporated, Tuck Mapping Solutions Inc., Leica Geosystems Inc., RiegI USA, Inc., and Esri.

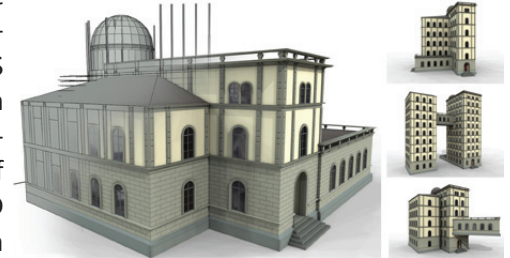


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Website: <http://usa2011.isprs-sc.org/>

### CityEngine – Smart 3D Cities

CityEngine is a standalone software that provides professional users in entertainment, architecture, urban planning, GIS and general 3D content production with a unique conceptual design and modeling solution for the efficient creation of 3D cities and buildings from typical 2D data at any resolution. The next plan of Esri is to integrate CityEngine into ArcGIS, allowing ArcGIS users to create and design 3D urban environments leveraging their existing GIS data to create high-quality 3D content.



Source: [http://www.esri.com/software/landing\\_pages/arcgis/city-engine.html](http://www.esri.com/software/landing_pages/arcgis/city-engine.html)

### SOCET SET v5.6

SOCET SET, BAE Systems’ digital mapping software application, is used for precision photogrammetry and geospatial analysis. The software is renowned for its unequaled depth, performance, and ability to ingest data from numerous government and commercial image sources. SOCET SET works with the latest airborne digital sensors and includes innovative point-matching algorithms for multi-sensor triangulation. It offers powerful functionality for triangulation, DEM extraction, orthorectification, mosaicking, and feature collection. SOCET SET v5.6.0 is now available with support for Esri ArcGIS 10 when using the SOCET for ArcGIS module. More than 300 enhancements have been implemented since the previous version in 2009. Customers worldwide use SOCET SET to create accurate, high resolution digital terrain and surface models, image maps, 3-D visualizations, GIS databases, and more.



Source: <http://www.socetgxp.com/content/products/socet-set/>

## STUDIES AND PRACTICAL WORK

**Università degli Studi della Tuscia** (Italy) is seeking a **researcher** to produce phytopathological thematic maps and to perform geostatistical analysis. Phytopathological data collection is related to incidence and severity of Chestnut Yellow in the areas of the Gran Sasso Monti della Laga National Park and to incidence and severity of Forest Decline in the Palo Laziale Forest. Application deadline: **October 16th**, 2011.

More at: <http://www.nature.com/naturejobs/science/jobs/210669-Development-of-GIS-phytopathological-thematic-maps-and-geostatistics-elaboration>

The **University of Uppsala** (Sweden) is offering a **Post-doc fellowship**. The duties include research and planning of research in geophysics with special emphasis on reflection seismic methods. The post-doc will participate in field work, data processing and interpretation activities in conjunction with externally financed projects. Focus will be on projects related to CO2 storage, mineral prospecting and development of seismic processing methods. This is a research position, but teaching up to 20% may be part of the duties. Application deadline: **October 31st**, 2011. More at: <http://www.earthworks-jobs.com/geoscience/uppsala11082.html>

The **Biogeoscience Group in Earth and Ocean Sciences at NUI Galway** (Ireland) seeks a **PhD student** to expand its research in marine geoscience. The research programme targets national priorities of providing added-value geoscience research based on databases at the Geological Survey of Ireland (GSI) and the Marine Institute (MI) in support of the optimum use of natural resources. The group is now in a position to recruit a person for a 4-year structured funded PhD programmes in the following area: "Quantitative Estimation of Seafloor Surface Physical Properties from Inversions of Multibeam Swath Acoustic Data". The objective of this PhD project is to utilise the outputs from existing parallelised C++ code to develop practical neural network or non-linear inversions of observed multibeam acoustic data. Application deadline: **October 28th**, 2011. More at: <http://www.earthworks-jobs.com/rsgis/nuig11082.html>

A fully funded **four-year Ph.D. position** is available at the **Department of Earth and Ecosystem science, Lund University**, Sweden. The proposed PhD project comprises collection of high temporal resolution palynological data sets, especially detailed mapping of the dinoflagellate cyst assemblages, retrieved from coastal sedimentary archives. Together with terrestrial records of land-use changes these datasets will be used to estimate and spatially map changes in eutrophication, surface salinity and temperature during the last two millennia of the coastal Baltic Sea. The project will be carried out within the framework of Managing Multiple Stressors in the Baltic Sea, which is a 5-year Strong Research Environment funded by the Swedish Research Council for the Environment (Formas). Application deadline: **October 14th**, 2011.

More at: <http://www.earthworks-jobs.com/environs/lund11081.html>

The **RBUCE-UP, 'Research Based University Chairs of Excellence - Universities of Paris'** (co-financed by Marie Curie COFUND) offers incoming Fellowships in France for **postdocs**. The programme offers funding for research stays of two years at one of the five Universities in the region of Paris, France. The call is open to proposals from all fields of research. The fellowships are open for non-french researchers of all further nationalities. Researchers must not have resided or carried out their main activity in France for more than 12 months in the three years prior to the deadline. More at: <http://www.rbuce-up.eu/>

## FUTURE ISPRS RELATED EVENTS

**WG VIII/6, VIII/8 & ISRS Joint International Workshop  
"Earth Observation for Terrestrial Ecosystems"**

Bhopal, India, 8 November 2011

More at: [www.commission8.isprs.org/wg6/](http://www.commission8.isprs.org/wg6/)

**International Geographic Union (UGI) 2011**

Santiago, Chile, 14-18 November 2011

More at: [www.ugi2011.cl/](http://www.ugi2011.cl/)

**WG V/5 Special Session about 3D Object Recognition & Tracking**

Berlin, Germany, 8-9 December 2011

More at: [www2.informatik.hu-berlin.de/cv/isprs/index.html](http://www2.informatik.hu-berlin.de/cv/isprs/index.html)

## INTERESTING LINKS

**CARIS LOTS freeware version**

[www.caris.com/products/lots-browser/](http://www.caris.com/products/lots-browser/)

**Open Source Observatory and Repository**

[www.osor.eu/](http://www.osor.eu/)

**Johns Hopkins University – Online Certificate in GIS**

[advanced.jhu.edu/academic/environmental/gis/](http://advanced.jhu.edu/academic/environmental/gis/)

**WeoGeo**

[www.weogeo.com/](http://www.weogeo.com/)

**GIS Acronyms**

[gislounge.com/gis-acronyms/](http://gislounge.com/gis-acronyms/)

**Open Source MATLAB Hyperspectral Toolbox**

[sourceforge.net/apps/mediawiki/matlabhyperspec/](http://sourceforge.net/apps/mediawiki/matlabhyperspec/)

**Vector1 Media**

[vector1media.com/resources/newsletter.html](http://vector1media.com/resources/newsletter.html)