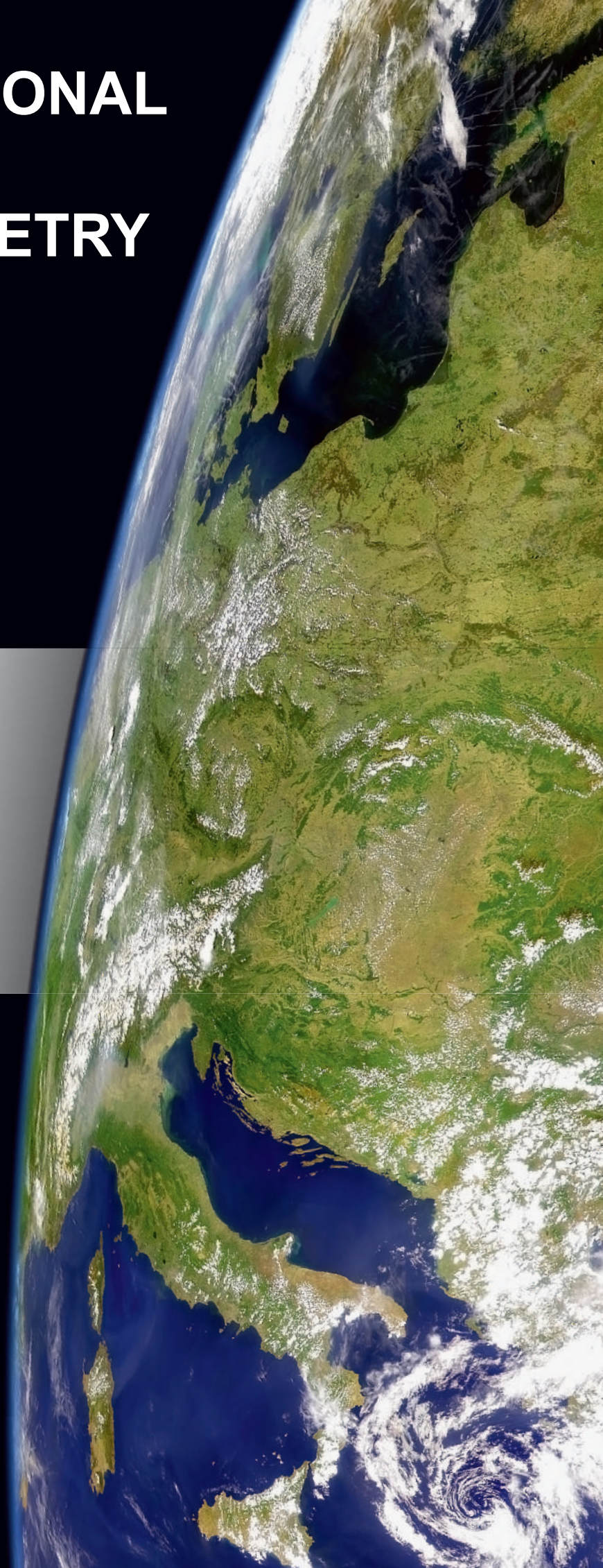


# THE INTERNATIONAL SOCIETY FOR PHOTOGRAMMETRY AND REMOTE SENSING



information from imagery

## 2014-15 Biennial Report



## ABOUT ISPRS - WWW.ISPRS.ORG

ISPRS is an international non-governmental organization that promotes international cooperation between the worldwide organizations with interests in the photogrammetry, remote sensing and spatial information sciences. Established in 1910, ISPRS is the oldest international umbrella organization in its field, which may be summarized as addressing “information from imagery”. ISPRS achieves its aims by:

- advancing knowledge in the areas of interest of ISPRS by encouraging and facilitating research and development, scientific networking and inter-disciplinary activities,
- facilitating education and training with particular emphasis on less developed countries,
- promoting public recognition of the contributions from the photogrammetry, remote sensing and spatial information sciences for the benefit of humankind and the sustainability of the environment.

## ISPRS MISSION

- To advance the photogrammetry, remote sensing and spatial information sciences through international cooperation in research, development and education for the benefit of society and for environmental sustainability.

## ISPRS VISION

- To be the foremost scientific organization in its field,
- to speak for all people working in the field,
- to provide the necessary resources to develop the field.

## XXIII ISPRS CONGRESS 2016

[WWW.ISPRS2016-PRAGUE.COM](http://WWW.ISPRS2016-PRAGUE.COM)

**LOCATION:** Prague, Czech Republic, 12 - 19 July 2016

**HOST:** Czech Society for Photogrammetry and Remote Sensing

**CONGRESS DIRECTOR:** Lena Halounová

Czech Technical University in Prague

INTERNATIONAL SOCIETY FOR  
PHOTOGRAMMETRY AND REMOTE SENSING

2014-15  
BIENNIAL REPORT

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## MESSAGE FROM THE PRESIDENT

At the very beginning of this four year term of office (2012-2016), ISPRS Council promised to do its best to provide a stronger scientific voice, to promote closer multi-disciplinary collaboration and to develop better services. I am now very pleased to inform you of some of the progress achieved since then.

First of all, ISPRS Council has prepared an overarching scientific vision and research agenda for the Society. It has been published in the ISPRS Journal of Photogrammetry and Remote Sensing as an original article entitled 'Information from Imagery: ISPRS Scientific Vision and Research Agenda' (accessible as a free-to-access, in-press article at: [dx.doi.org/10.1016/j.isprsjprs.2015.09.008](https://doi.org/10.1016/j.isprsjprs.2015.09.008) at the time of writing). This 19-page vision paper examines the significant challenges currently facing ISPRS and its communities, such as providing high-quality information, enabling advanced geospatial computing, and supporting collaborative problem solving. The state-of-the-art in ISPRS related research and development is reviewed and the trends and topics for future work are identified. By providing such an overarching scientific vision and research agenda, we hope to call on and mobilize all ISPRS scientists, practitioners and other stakeholders to continue improving our understanding and capacity on information from imagery and to deliver advanced geospatial knowledge that enables humankind to better deal with the challenges ahead, posed for example by global change, ubiquitous sensing, and a demand for real-time information generation. In addition, we hope this vision paper and other review/overview papers (to be published in the ISPRS Journal of Photogrammetry and Remote Sensing's theme issue on 'The state-of-the-art of Photogrammetry and Remote Sensing' in Spring 2016) will also provide guidance and support for the preparation of the 2016 Congress resolutions, Terms of Reference of Technical Commissions, and the formation of new working groups.

Secondly, we have strengthened the collaboration with many other international and regional organizations. For instance, the final survey result of the mapping status in the world was released by ISPRS at the 2015 annual conference of UN-GGIM (the United Nations Global Geographic Information Management) in August, 2015. A representative of ISPRS, Mario Hernandez, has been appointed as a member of the Engagement Committee of Future Earth of the International Council for Science (ICSU). An international declaration on 'Supporting Future Earth with Geospatial Information' has been prepared by ISPRS, together with other sister organizations and will be released at the coming ISPRS Prague Congress. ISPRS has also been devoted to GEO (Group of Earth Observation) global land cover activities through the organization of workshops, the publication of a theme issue and the preparation of international cooperation initiatives.

Thirdly, several new services have been developed for ISPRS members and societies, including the organization of the biennial ISPRS Geospatial Week, the introduction of ISPRS Individual membership, the restructuring of ISPRS Technical Commissions and a new and open access academic

journal - the International Journal of Geo-Information. Recently, we began establishing an International Industrial Advisory Committee to encourage more geospatial companies and industrial players to join and benefit from ISPRS, the preparation of National Mapping and Space Agency Forums, to be held at the Prague Congress and we continue supporting the ISPRS Scientific Initiative.

These achievements would not happen without the strong support from ISPRS officers (Technical Commission Presidents, Working Group Chairs, Co-Chairs and secretaries, ISAC, IPAC, our journal editors, Regional Representatives) and ISPRS members (Ordinary Members, Associate Members, Regional Members, Sustaining Members, and Honorary Members and Fellows) and many others. I would like to take this opportunity to thank all of them!

I very much hope to see you soon at the ISPRS Prague Congress!

Chen Jun  
National Geomatics  
Center of China  
Beijing



## MESSAGE FROM THE SECRETARY GENERAL

During 2014 and 2015 a large number of activities were launched and further developed by ISPRS Headquarters. Some were directed to improve the internal structure of the society - most notably the discussion about new commissions. Throughout 2014, ISPRS members were invited to contribute their ideas and opinions on a suggestion to re-focus the ISPRS activities. Discussions were held at every of the eight Commission Symposia and a blog was opened to obtain additional input. A vote by postal ballot was then organised in early 2015, in which the ISPRS Ordinary Members accepted the new structure with an overwhelming majority. As a result, the bidding process to host a commission during 2016 - 2020 will deal with these five new commissions:

|                |                             |
|----------------|-----------------------------|
| Commission I   | Sensor Systems              |
| Commission II  | Photogrammetry              |
| Commission III | Remote Sensing              |
| Commission IV  | Spatial Information Science |
| Commission V   | Education and Outreach      |

Also the scientific meeting calendar was enhanced. With the aim to come to larger and more visible ISPRS meetings, the ISPRS Geospatial Week (GSW) was introduced. The GSW is a bundle of different workshops held at the same time and at the same place. It was first held in Antalya, Turkey, in Nov. 2013, the 2nd edition took place in La Grande Motte - Montpellier, France, in Sept./Oct. 2015. Both meetings attracted a large number of participants and provided high level scientific contributions. In the meantime, a bidding procedure similar to the one for the Congress and the Commissions was established; as a result of the first round, ISPRS GSW 2017 will be held in Wuhan, China, from Sept. 18-22, 2017.

It is worth mentioning that the proceedings of the ISPRS meetings, the Archives and the Annals are now both included in the Web of Science, giving the authors the credit they deserve for their valuable work. While the Archives have also been introduced into SCOPUS already, an application for the Annals is currently under review. In addition, both series have been submitted for EI, the well known Engineering Index.

Council has set aside a significant amount of financial resources during the last four years to fund projects under the newly established ISPRS Scientific Initiative. Following calls in 2014 and 2015, six and seven projects, respectively, were funded, spanning a range of subjects from curricular development to open source and benchmark activities. It is now planned to launch additional calls every two years.

I invite you to explore ISPRS activities further. The best opportunity will be to join the ISPRS Congress in Prague in July 2016 - see you there!

Christian Heipke  
Leibniz Universität  
Hannover



## MESSAGE FROM THE CONGRESS DIRECTOR

The year of 2014 was busy for all ISPRS members. Each Technical Commission organized its symposium and the Congress Director took part at seven of them. However, there were many non-ISPRS events, at which the presence of the Director was expected. Participation in these events was connected with the promotion of the scientific and commercial issues of the 2016 Congress.

Information on the Congress, the most important ISPRS event, was presented to scientists, researchers, students, commercial employees, and politicians at the United Nations Office of Outer Space Affairs meeting in Vienna, at the Conference of the American Society for Photogrammetry and Remote Sensing, at the Russian conference and exhibition GeoSiberia, at the Global Space Applications Conference (GLAC) of the International Astronautical Federation in Paris, at the International Meeting of Students of Geodesy IGSM, and at the Asian Conference of Remote Sensing in Myanmar. A large promotion campaign for the commercial world was organized by the ISPRS Secretary General and the Congress Director during the world's largest exhibition of photogrammetry – Intergeo. The Secretary General and the Congress Director presented ISPRS, its news, advances and plans, including important details about the Congress and were able to talk to many representatives of private companies. Similar activities took place at scientific events in the many other countries, incl. UAE, Turkey, Taiwan and China in 2015. An intensive effort was invested into the promotion of the Congress also by media partners, in newsletters and journals.

This year was also dedicated to the preparation of a brand new ISPRS reviewing system for full paper and abstract submissions for the Congress. It is a result of the mutual cooperation of the Congress International and Local Programme Committees, Presidents of the International Programme Committee, the Secretary General and the local organising staff. In the meantime nearly 2000 abstracts and full papers have been submitted.

We look forward to welcoming you in Prague at the 2016 ISPRS Congress!

<http://www.isprs2016-prague.com>

Lena Halounová  
Czech Technical  
University in Prague





## COMMISSION I - SENSORS AND PLATFORMS FOR REMOTE SENSING

Technical Commission I is primarily focused on primary data acquisition and processes, including remote sensing technologies, sensor platforms, geometric and radiometric sensor calibration, geo-referencing and sensor orientation, image and data standards, low-level sensor integration, and system design.

The ISPRS Technical Commission I Symposium, in conjunction with the Pecora 19 and IAG Commission 4 Symposium, was the most important event of the 2014-2015 period and was held from November 17–20, 2014, at the Renaissance Denver Hotel in Denver, Colorado, with great success for all involved and in attendance. The Symposium, titled *Sustaining Land Imaging: UAS to Satellites*, welcomed over 480 attendees from more than 25 countries around the globe, representing all the six continents, for a unique and thought provoking two and a half days of technical sessions. In 35 sessions, presentations ranged in topic from “UAS and Data Analysis” to “Landsat and Sentinel”, “Land Cover Change”, “Mobile Mapping Technologies” and many more.



From the 102 submissions to ISPRS TC I track, 62 were accepted for oral presentation, including three young authors whose travel was supported by the ISPRS Foundation, and from the 20 full-paper submissions, ten passed the double-blind peer-review. The manuscripts in both the ISPRS Annals and Archives cover a broad range of topics related to remote sensing platforms and sensing technologies, providing an excellent review on recent developments in the state-of-the-art sensing techniques and methods of photogrammetry, remote sensing and engineering geomatics, as well as their applications to mapping and Earth sciences. On the platform side, UAS and small satellite



constellations have shown remarkable developments, generating unprecedented interest, and prompting sensor providers to better accommodate these remote sensing platforms. In particular, advancements in LiDAR technologies are noteworthy, as miniaturized laser sensors are in high demand. Research to exploit the new sensors and sensing capabilities offered by cooperating sensor platforms is rapidly increasing.

There were several meetings organized and co-organized by various TC I Working Groups, and below are listed a few important ones. The ISPRS PIA+HRIGI 2015 workshop on *Photogrammetric Image Analysis (PIA) and High-Resolution Earth Imaging for Geospatial Information (HRIGI)*, hosted by the Technical University of Munich, was held from March 25 - 27, 2015, organized in cooperation with WGs I/2, I/4 with II/4, IV/2 and VII/2, and attracted contributions from 25 countries. The UAV-g 2015 International Conference of Unmanned Aerial Vehicles in Geomatics with the theme of *Small Unmanned Aerial Systems (sUAS): A Disruptive Technology for Geomatics* was organized by ICWG I/5b at York University, Toronto, Canada from August 30 - Sept. 2, 2015. It attracted 260 participants from 34 countries. The conference included two workshops, three plenary sessions, fourteen technical sessions, one poster session, a two day exhibition and a sUAS technology demonstration day at Markham Airport, located about 30 km northeast of York University. The workshop on *Passive and Active Electro-Optical Sensors for Aerial & Space Imaging* was co-organized by WG I/2, I/4 and I/5 in Auckland, New Zealand. The 9<sup>th</sup> *International Symposium on Mobile Mapping Technology (MMT 2015)*, jointly organized by TC I, WG I/3 and ICWG I/Va, was held at UNSW, Sydney, Australia, December 9-11, 2015, attracting 293 participants from 34 countries. The program included three keynotes, panel discussion, invited papers, oral and poster presentations in 29 sessions. Out of the 266 submissions, 156 were full papers for peer review and the best papers will be published in a special issue of the Journal of Surveying Engineering, Journal of LBS, PE&RS.

WG I/2 provided the implementation of the ISPRS Scientific Initiative “Benchmark on High Density Image Matching”, which has the thematic link to the ICWG I/Vb initiative “A new benchmark dataset for multi-platform very high resolution photogrammetry.”

TC I puts a high priority on education, and actively supported three summer schools in 2014-2015, including the 2<sup>nd</sup> International Summer School on Mobile Mapping Technology, Tainan, Taiwan, June 9–13, 2014; IEEE/ISPRS International Summer School, Curitiba, Brazil, Oct. 28–30, 2015; and the 3<sup>rd</sup> International Summer School on Mobile Mapping Technology, Xiamen University, Xiamen, China, April 26-28, 2015.

The publication activity in TC I made significant progress recently, indicated by organizing and contributing to several special journal issues, and, most importantly, by the growing trend of peer-reviewed paper submission to TC I WG meetings, which are increasingly published in the ISPRS Annals. TC I has also been actively cooperating with various sister societies, including IAG, IEEE, FIG, ION, etc.



Charles Toth, Ohio State University, Columbus

## COMMISSION II - THEORY AND CONCEPTS OF SPATIAL INFORMATION SCIENCE

Commission II continues its role in advancing the research, technology and applications of spatial information science, which faces a number of important challenges. One is to develop representation and modeling that are more suited for multi-scale, multi-dimensional and multi-temporal data for better support to spatial decision making. A second one is to develop effective methods, tools and algorithms for integrating, mining and visualizing existing and newly created multi-resolution spatio-temporal sensor data. A third one is to implement robust quality control assessment of spatial data and analysis at multiple scales using existing and new approaches to uncertainty modeling including multivariate statistics, crowdsourcing and citizen science. In addition, an emerging challenge is geo-computing infrastructures, specially the development of server, web and mobile frameworks to enable high performance computing (e.g., grid and cloud computing) for big geospatial data processing, modeling and simulation.

The Commission has paid more attention on big geospatial data handling, which involves linked data, geosocial media data, crowdsourcing data, open data development, etc. to facilitate scientific dialogues and further investigations on whether the traditional GIS theory, concepts and methods are sufficient to process these new datasets. Some efforts include:

- ISPRS Tracking and Imaging Challenge 2014: co-organized by WG II/8 and WG III/3, the Challenge encouraged applications using and integrating both imagery data and trajectory data;
- ISPRS Open Data Challenge 2015: organized by WG II/7, the Challenge aimed at promoting research and creative ideas on open data – using over one million transaction records from smart card data;
- Collective preparation of the TC II Position Paper on “Geospatial Big Data Handling Theory and Methods: A Review and Research Challenges”, published in *ISPRS Journal of Photogrammetry and Remote Sensing*;
- Organizing Theme Sessions on “Location-based Social Media Data”, “Linked Geospatial Data”, “Open Data Development”, “Perceptual and Cognitive Experiments with Imagery and 3D Models” and “Smart Cities”, and Tutorials on “Usability Methods and Eye Movement Analysis for Understanding the Use of Remotely Sensed Imagery, 3D Geovisualizations and Virtual Reality” in 2016 ISPRS Congress.

From the beginning of 2014 to the end of 2015, the major activity of the Commission was to organize its Midterm Symposium, held in October 2014 in Toronto, Canada, which was joined by the 2014 Spatial Data Handling Symposium. The working groups of the Commission have organized or co-organized several conferences and workshops, including:

- ISPRS International Conference on Geospatial Information Research, 15-17 November 2014, Tehran, Iran (WG II/1, WG II/4, ICWG II/IV)

- ISPRS & ACM SIGSPATIAL CHINA Joint Workshop on Spatial Big Data Mining & Visualization, 14 December 2014, Shenzhen (WG II/7)
- ISPRS Workshop on Trust in Spatial Data and Validation of Global Land Cover Mapping, 5-7 June 2015, Shanghai (WG II/4, ICWG IV/II/VIII)
- Spatial Statistics Conference, 9-12 June 2015, Avignon (WG II/4)
- 4th International Workshop on Web Mapping, Geoprocessing and Services, 1-3 July 2015, Cagliari (WG II/6, II/7, ICWG IV/II, Co-sponsors)
- 18th ICA Workshop on Generalization and Multiple Representation, 21 August 2015, Rio de Janeiro (WG II/2, Co-organizer)
- International Workshop on GeoVIS 2015: Rendering and Cognition with Images and Hybrid Visualizations, Geospatial Week, 1-2 October, 2015, La Grande Motte (WG II/6, Co-organizer)
- ISPRS Session – Massive Mobility Data Analysis and Mining, during 9th Symposium of the International Society for Digital Earth, 5-9 October, 2015, Halifax (WG II/3)
- ISPRS Workshop during 2015 Joint International Geoinformation Conference, 28-30 October 2015, Kuala Lumpur (WG II/2)
- International Workshop on Mobility and Land Cover Change Mapping, 5-6 December 2015, Changsha (WG II/8, ICWG IV/II/VIII)

In addition, the Commission, together with its WGs, has also edited several special journal issues on 1) "Multi-dimensional Modeling, Analysis and Visualization" in *ISPRS Journal of Photogrammetry and Remote Sensing*, 2) "Selected Papers from the ISPRS Tracking and Imaging Challenge 2014", "Borderlands Modeling and Analysis", "Bridging the Gap between Geospatial Theory and Technology", "Multi-Dimensional Spatial Data Modeling", "Advances in Spatio-Temporal Data Analysis and Mining" in *ISPRS International Journal of Geo-Information*, 3) "Geovisual Analytics: Design and Implementation" and "Geovisual Analytics: Human Factors" in *International Journal of Digital Earth*, and 4) "Advances in Geospatial Statistical Modeling, Analysis, and Data Mining" in *Geomatica*.

Some of the more recent research topics addressed through the above activities include geodesign, geospatial big data, geosocial media data, mobility data for land-cover change detection, generalization for on-demand mapping, and trust and degree of trust in spatial data and modeling. For example, the concept "trust in spatial data" has led to the development of a framework that consists of trust measurement, modeling and controlling.

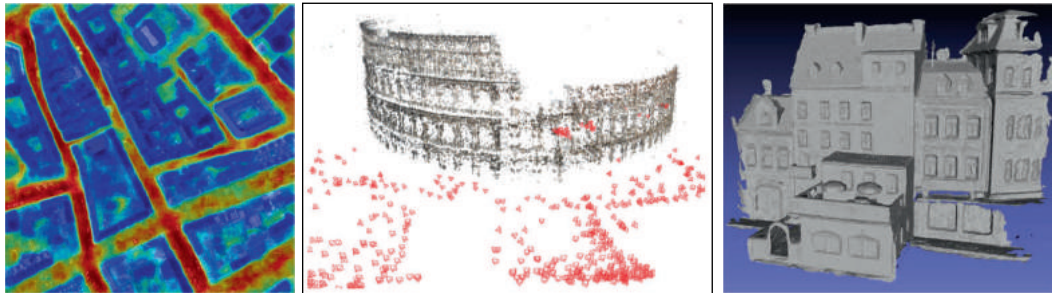
It is anticipated that continued attention will be paid to the role of the citizens (volunteered geographic information) and social networks, the use of pervasive geographic information (e.g., geosocial media data), dynamic geospatial computing for real-time monitoring and analysis, the use of new computing paradigms for handling of large, heterogeneous data streams, and the importance of temporal dimension and uncertainty issues.

Songnian Li  
Ryerson University  
Toronto





## COMMISSION III - PHOTOGRAMMETRIC COMPUTER VISION AND IMAGE ANALYSIS



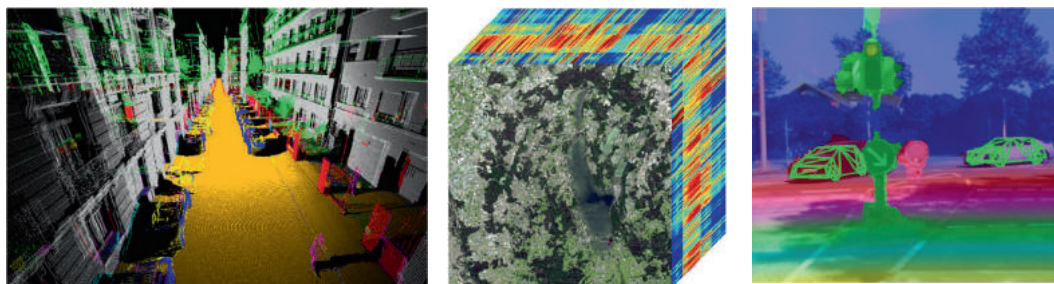
TC III is the “theory and algorithms commission” of ISPRS – our mission is to design, develop and evaluate mathematical models and automatic methods for geometric reconstruction and semantic interpretation from image and range data. This includes, in particular, calibration and image orientation, as well as surface reconstruction, processing and analysis of laser scans and range data, image and point cloud interpretation, and the analysis of dynamic scenes based on image sequences. Emphasis is given to geometric, semantic, and statistical models of the data as well as the observed objects and events. TC III also serves as a link to the neighbouring disciplines of computer vision, computer graphics, pattern recognition and machine learning.

Recent trends we observe in these fields are, among others: routine use of large image collections with thousands of pictures even in comparatively small close-range projects; widespread commercial use of micro UAVs; an increasing focus on semantic data analysis through supervised machine learning; the move to true 3D surface modelling; rising interest in image sequences and dynamic scenes.

The 2014-2015 period started with the preparation of one of the commission’s main events, the Midterm Symposium “Photogrammetric Computer Vision”, held this time in Zürich, in conjunction with the European Conference on Computer Vision. Beyond that, the commission has been very active in (co-)organising further scientific meetings, both in the frame of ISPRS events and with sister societies, including

- TC III Midterm Symposium Photogrammetric Computer Vision 2014
- Pattern Recognition in Remote Sensing 2014 at the IAPR Int’l Conference for Pattern Recognition; ICWG III/VII co-chair Jie Shan also serves as co-chair of the IAPR technical commission on remote sensing
- EuroSDR/ISPRS Workshop on National Scale 3D Models 2014, with strong participation from national mapping agencies
- the workshops Multisensor Fusion 2014, Multisensor Fusion 2015, and EarthVision 2015 at the annual IEEE Computer Vision and Pattern Recognition Conference
- the first joint edition of Photogrammetric Image Analysis (PIA) and High-Resolution Earth Imaging for Geospatial Information 2015
- Unmanned Aerial Vehicles in Geomatics (UAV-g) 2015





- Laser Scanning 2015, City Models, Roads & Traffic (CMRT) 2015, Image Sequence Analysis 2015 within the 2nd ISPRS Geospatial Week
- the Workshop on Photogrammetry for Surveillance, Biometrics and Biomedicine 2015.

Moreover, several working groups continued to develop open datasets and benchmarks, one of the focus topics of the current working period. Activities in this direction include

- the completion of the large-scale ISPRS Urban Classification Benchmark by WG III/4, with two completely labelled high-resolution datasets from the German cities of Vaihingen and Potsdam. The extensive effort to generate manually annotated groundtruth was supported by the ISPRS scientific initiative.
- contributions from WG III/1 to the 2014 update of the popular Middlebury Stereo Benchmark, with more and more difficult stereo pairs.
- the Tracking and Imaging Challenge for image sequence analysis, co-organised by WG III/3 and WG II/8, held as a special session of the TC III Midterm Symposium. The challenge was supported by the ISPRS scientific initiative.
- The EnMAP contest for hyperspectral land use labelling, with strong participation from ICWG III/VII.
- Participation of WG III/3 in the upcoming extension of the popular KITTI Benchmark for automotive vision (to be launched in 2016).

TC III members also served as editors for a number of journal special issues, both in the society's flagship publication, the ISPRS Journal of Photogrammetry and Remote Sensing and in other journals of our field:

- a special section of the ISPRS Journal with extended versions of the award-winning papers from the Midterm Symposium (2015)
- a special issue of the ISPRS Journal on Multi-temporal Remote Sensing Data Analysis (2015)
- a special issue of the IEEE Journal on Selected Topics in Applied Earth Observations and System Letters, with selected papers from the MSF and EarthVision Workshops (to appear 2016)
- a special issue of Remote Sensing journal on airborne laser scanning (to appear 2016).

For further information, please visit <http://www2.isprs.org/commissions/comm3.html>.



Konrad Schindler  
ETH Zurich

## COMMISSION IV - GEOSPATIAL DATABASES AND LOCATION BASED SERVICES

In the past two years, Commission IV and its ten working groups (including two inter-commission working groups with TC II and TC VIII, respectively) made significant efforts by organizing conferences and publishing research papers. Below we report on the major activities.

### The Mid-term Symposium:

The TC IV Symposium on “Geospatial Database and Location Based Services” was held from 14-16 May, 2014, in Suzhou, China. There were 320 registered participants from 17 countries and regions taking part in the symposium, including 42 ISPRS officers. A total of 83 full papers were published in ISPRS Archives and Annals. Nineteen oral sessions and 2 poster sessions were organized. Three keynote speeches were delivered: ‘Street View Maps based LBS’ by Deren Li, ‘Service-oriented Cartography and Location-based Services’ by George Gartner and ‘The Art of Creating 1:1 Scale Full Body Photo Mosaics of Whales’ by Bryant Austin. The ISPRS TC IV business meeting was held and technical exhibitions and social events were organized. The symposium was a great success. The quality of papers and the presentations was quite high. The symposium provided good opportunities for scientists, researchers and practitioners to discuss cutting-edge technologies, exchange research ideas, and promote international collaboration.



### Workshops:

- WG IV/1 (Methods for the Update and Verification of Geospatial Databases) acted as co-organizers of the workshop on Photogrammetric Image Analysis and High-Resolution Earth Imaging for Geospatial Information (PIA15 + HRIGI15) in Munich, from 25-27 March 2015, jointly with other 6 WGs.
- WG IV/2 (Global Status of Mapping and Geospatial Database Updating) organised the 2<sup>nd</sup> workshop on “Global Geospatial Information and High Resolution Global Land Cover/Land Use Mapping” during the Interexpo Geo-Siberia-2015 in Novosibirsk, from 20-22 April, 2015.
- WG IV/3 (Global DEM Interoperability) have planned the Workshop on “Advances in Global DEMs and Tools for Assessing their Quality, Usability and Interoperability”, to be held on 14-16 March, 2016, in Taiwan, China.

- WG IV/4 (Geospatial Data Infrastructure) organized the Workshop on "The Role of Land Professionals and Spatial Data Infrastructure in Disaster Risk Reduction in the Context of Post 2015 Nepal Earthquake" from 25-27 November, 2015, at Kathmandu, Nepal, jointly with FIG Commission 2 (Professional Education). They also organized a joint session at the TC VIII Symposium in Hyderabad.
  - WG IV/5 (Web and Cloud Based Geospatial Services and Applications) organized the 4th International Workshop on "Web Mapping and Geoprocessing Services and Applications (WebMGS 2015)" from 1-3 July 2015 in Cagliari, Italy, jointly with another 3 WGs and a joint session "Web/cloud Based Mapping" at the 27th ICC & the 16th General Assembly of ICA in Rio de Janeiro, Brazil, from 23–28 August 2015.
  - WG IV/7 (3D Indoor Modelling and Navigation) organised the workshop on "Indoor Modelling, Mapping and Navigation" from 21-22 May, 2015, in Tokyo, Japan and organized sessions and workshops at the Geospatial Week, UDMS, ACRS 2014 and OGC events.
  - WG IV/8 (Planetary Mapping and Spatial Databases) organized a workshop on "Planetary Mapping and Spatial Databases" from 24-25 September, 2015, in Berlin, Germany.
- ICWG IV/II (Computing Optimization for Spatial Databases and Location Based Services) organized the workshop on "Spatiotemporal Computing" from 13-15 July, 2015, in Fairfax, VA, USA and organized sessions at the AAG 2014 and 2015 annual meetings.

#### **Publications:**

Papers from all workshops have been published in ISPRS Annals or Archives. Some are published in special issues, including:

- IJ for Digital Earth: Analytical Geospatial Digital Earth, by WG IV/5.
- IJGI: 3D Indoor Modelling and Navigation, by WG IV/7
- Sensors: Sensors for Indoor Mapping and Navigation, by WG IV/7

A book *Spatial Cloud Computing - A Practical Approach* written by Chaowei Yang, from ICWG IV/II, has been published. More special issues are in preparation and to be published in early 2016, by WG VI/1 and ICWG IV/II.

#### **Others:**

- Research on "Global Status of Land Cover Mapping and Geospatial Database Updating" received the 2015 funding as an ISPRS Scientific Initiative.

Jiang Jie  
National Geomatics Center of China  
Beijing



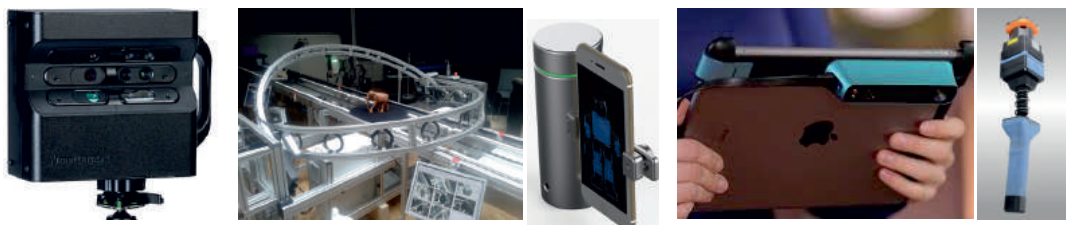
## COMMISSION V - CLOSE-RANGE IMAGING, ANALYSIS AND APPLICATIONS

The ISPRS Technical Commission V deals with close-range imaging sensors and applications in the field of industrial metrology, cultural heritage, architecture, biomedical and geosciences ([www.commission5.isprs.org](http://www.commission5.isprs.org)). Close-range photogrammetry is nowadays based on professional and consumer grade digital cameras, as well as active sensors such as terrestrial laser scanners, range cameras, gaming or stripe projection systems. These sensors are investigated, combined and used for 3D representations and the analysis of static and dynamic objects or scenes. Systems and algorithms for real-time imaging, mobile mapping applications and 3D modelling issues are also considered and developed.

The ISPRS Commission V scientific activities are organised through 5 Working Groups:

- Vision Metrology
- Cultural Heritage Data Acquisition and Processing
- Terrestrial 3D Imaging and Sensors
- Terrestrial 3D Modelling: Algorithms and Methods
- Close-range Measurements for Biomedical Sciences and Geosciences and two Inter-Commission Working Groups jointly coordinated with Technical Commission I:
  - Mobile Scanning and Imaging Systems for 3D Surveying and Mapping
  - Unmanned Vehicle Systems: Sensors and Applications.

Commission V is now also investigating the increasingly mature nature of non-contact active and passive optical 3D measurement systems. New devices are available mobile or static, with real-time or offline 3D measurement capabilities. Drones are everywhere and mobile mapping is reaching the market with many hand-held solutions. Automated data processing is quickly evolving and bringing successful stories even if there are still many research issues to be solved in the image- and range-based 3D reconstruction domains.



In the past two years, there were many activities related to Commission V. Foremost, the Midterm Symposium which was held in Riva del Garda (Italy) from 23 to 25 June, 2014 (<http://isprs-commission5.fbk.eu>). The Symposium featured three days with plenary and parallel sessions, almost 300 participants, 160 articles in the proceedings, five invited speakers, seven



best paper awards, three workshops of EU projects, two tutorials and a special session, dedicated to the 25<sup>th</sup> anniversary of the Japanese ARIDA association.



WG officers have been involved in the organization of many other meetings and scientific activities:

- SPIE Optical Metrology Conference "Videometrics, Range Imaging and Applications XIII", 22-25 June, 2015, Munich (Germany)
- Indoor-outdoor Seamless Modelling, Mapping and Navigation, 21- 22 May, 2015, Tokyo (Japan)
- 3rd International Summer School on Mobile Mapping Technology, 26-30 April, 2015, Xiamen (China)
- European Geosciences Union General Assembly 2015, 12-17 April, 2015, Vienna, (Austria)
- 6th International ISPRS Workshop 3D-ARCH'2015, 25-27 Feb, 2015, Avila (Spain)
- ISPRS / CIPA workshop "Underwater 3D Recording and Modelling", 16-17 April, 2015, Piano di Sorrento (Italy)
- Innsbruck Summer School of Alpine Research 2015 - Close Range Sensing Techniques in Alpine Terrain, 5-11 July, 2015, Obergurgl (Austria)
- 25th International CIPA Symposium, 30 Aug. - 5 Sept., 2015, Taipei (Taiwan)
- UAV-g 2015 Conference - International Conference on Unmanned Aerial Vehicles in Geomatics, 30 August - 2 September, 2015 Toronto, Ontario (Canada)
- EPMC European Portable Metrology Conference, 9-11 November, 2015, Manchester (UK)
- 9<sup>th</sup> International Symposium on Mobile Mapping Technology, 9-11 December, 2015, Sydney (Australia).



Fabio Remondino  
FBK Trento



## COMMISSION VI - EDUCATION, TECHNOLOGY TRANSFER AND CAPACITY DEVELOPMENT

Technical Commission VI presently focuses on education, technology transfer and capacity building. Its current goal is to support, promote, and stimulate Geoinformatics education and training, computer-assisted distance learning, methodology and curriculum development, technology transfer and capacity development, and promotion of the profession to young people. Most of these have been achieved with success. These goals were accomplished by six working groups.

A series of productive activities have been conducted on Geoinformatics education. Examples of new and significant developments include summer schools, workshops, free satellite data distribution, new curriculum development and web-based resource sharing. Some activities continue the very successful tradition started by the Student Consortium in 2004 and the 3S-Summer Students Seminar in 2010. These are explained below.

### **Symposium, Summer Schools and Workshops**

The first major event was the Midterm ISPRS Technical Commission VI Symposium on “Data, Information, and Knowledge Sharing for Geo-Education”, which was held in Wuhan, China, from May 19 to 21, 2014. It was organized jointly by the State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing (LIESMARS), ISPRS TC VI, and the International Cartographic Association Commission on Education and Training. Over 300 participants from 22 countries, including more than 60 conference representatives and over 200 students from the 2014 Geoinformatics Summer Camp & 11th ISPRS Summer School and 5th ISPRS 3S–Summer Students Seminar attended the symposium. In the three day symposium, a diverse range of papers related to Geo-Education in ISPRS and ICA areas of interests were presented.

TC VI was also involved in the organization of several workshops:

- The organisation of the 10th Education in GIS workshop held in Potsdam, Germany (12-13 June, 2014)
- A joint session at the ISPRS TC VIII Midterm Symposium (9-12 December, 2014) in Hyderabad, India
- Two Interexpo GEO-siberia events in Novosibirsk, Russia (May, 2014 and April, 2015)
- The workshop ‘Advances in Web-based Education Services’ (18-19 June, 2015) Berlin, Germany
- A Summer School at Dehradun (India) from 6-10 July, 2015, on the following three themes: 1) Online Sharing of Geospatial Data, Algorithm & Model, 2) Open Source GIS, and 3) Research and Teaching Methodologies. A total of 81 students, researchers and professionals participated in the three courses.

- The ISPRS Caravan Workshop on “Innovative Geospatial Technologies” in Nanchang, from 21-22 June, 2015, and in Hong Kong, on 7 December, 2015.
- A GlobeLand30 Theme Session (and paper competition) at the 2016 ISPRS Congress.

Commission VI continued its effort on nurturing the young generation by organizing student-specific events and other actions that integrate youth more effectively into ISPRS. One of the significant events was the 11th ISPRS Student Consortium and WG VI/5 Summer School which was held jointly with the 2014 Geoinformatics Summer Camp and the 5th 3S-Summer Students Seminar at Wuhan University, Wuhan, China, from 23-27 May, 2014. The 12th ISPRS Student Consortium and WG VI/5 Summer School were held at the University of Forestry, Nay Pyi Taw, Myanmar from 1-5 November, 2014. The 13th ISPRS Student Consortium and WG VI/5 Summer School were successfully held in Quezon City, Philippines (24-28 October, 2015).

The 14th ISPRS Student Consortium and WG VI/5 Summer School has also been planned to be held before the 2016 ISPRS Congress in Prague, Czech Republic. WG VI/5, the Student Consortium, and the Congress organizers are jointly undertaking the organization and preparation of this event. In addition, WG VI/5 and the Student Consortium also published 8 issues of ISPRS SC Newsletter between 2014 and 2015.

WG VI/3 worked with students of the University of Cassino and the University of Cluj-Napoca to carry out activities of surveying inside an archaeological site in Antiqua Aquinum for the excavation of a medieval church. An Erasmus project has been activated for mobility of teachers and students between the University of Cassino and Southern Lazio and the University of Cluj-Napoca for courses, workshops and the training of students in Geomatics.

WG VI/4 organized the 6th 3S-Summer Students Seminar in Moscow State University of Geodesy and Cartography from 17-21 Aug 2015. Tongji University (Shanghai, China) becomes the fourth member of the 3S-Summer Students Seminar, and the 7th 3S-Summer Students Seminar will be held there in 2016.

WG VI/6 organized a series of White Elephant sessions in the ISPRS Commission VI Symposium (2014), ISPRS Commission VII Symposium (2014), ACRS 2014, and ACRS 2015.

The 2015 Geoinformatics Summer School was jointly organized by ISPRS Commission VI, IEEE GRSS Earth Science Informatics Technical Committee and Wuhan University in Wuhan, China (4-14 June, 2015).

### **Curriculum Design and Development**

To develop new theories, methodologies and advanced technologies to be used more broadly, new curricula were designed by the Commission.

- One course is the “Geospatial Service Platform for Education and Research”, which was developed by WG VI/1 and taught during the 2014 Geoinformatics Summer School, sharing cutting-edge achievements of

a geospatial service platform and online tools from the platform for geospatial data processing and scientific research.

- In 2015, the Commission released another course, “Spatial-Temporal Big Data Analytics and Data Science”, during the 2015 Geoinformatics Summer School, which provides an introduction to the data science and some technologies and approaches.
- WG VI/6 developed a new curriculum, “GIS and Data Acquisition for Heritage Documentation”, to help document African heritage sites using GIS technologies. WG VI/6 also developed a new MSc program in Pristina, Kosovo, with Balkan partners, sponsored by the EU TEMPUS program in 2014.

### Free Satellite Data Distribution

A Free FORMOSAT-2 Data Initiative was launched in Feb 2014, to grant winners with up to 10 free FORMOSAT-2 images, which have a unique daily-revisiting capability to acquire images at a nominal ground resolution of 2 meters (panchromatic) or 8 meters (multispectral). This project was initiated by WG VI/5 and sponsored by the National Space Organization, National Applied Research Laboratories and jointly supported by the Chinese Taipei Society of Photogrammetry and Remote Sensing and the Center for Space and Remote Sensing Research, National Central University of Taiwan.

### Projects

Two projects by Commission VI were funded by ISPRS Scientific Initiatives in the past two years.

- The “Curriculum Development for the African Geospatial Sciences Institute” project, involving ISPRS Working Group VI/3, ISPRS Regional Members, cognate societies and local organization, have developed a framework for the curriculum and identified a draft set of modules and a number of issues.
- Working Group VI/2 is working on another project on “Assessment of Learning Pedagogy in Geoinformatics”, aimed to emphasize on assessing various theories and methods of evaluation (rating) of learning through education, system and structure in Geoinformatics.



Jianya Gong  
Wuhan University

## COMMISSION VII - THEMATIC PROCESSING, MODELING AND ANALYSIS OF REMOTELY SENSED DATA

The aim of the technical commission is to promote remote sensing in general and information extraction in particular.

### **Accomplishments of TC VII**

- Organization of a Special 'ISPRS Session' at the INTERGEO EURASIA Trade Fair and Conference, Istanbul, April, 2014.
- TC VII Midterm Symposium 2014 was held at the Istanbul Technical University, Istanbul - Turkey, from 29 September to 2nd October, 2014 and addressed diverse topics related to methodologies and technologies, keeping participants up to date with the latest advances in remote sensing applicable to various disciplines. A total of 58 papers were presented and 3 tutorials were organized.
- Participation at the 2014 TC IV Midterm Symposium in Suzhou, China and 2014 TC I Midterm Symposium in Denver, USA.
- Participation at the ISPRS Workshop on Trust in Spatial Data and Validation of Global Land Cover Mapping, June 2015, in Shanghai and International Workshop on Supporting Future Earth with Geo-information, June 2015, in Beijing, China.
- A review paper titled 'Time Series Analysis of InSAR Data: Methods and Trends' has been accepted for publication in the theme issue of the ISPRS Journal of Photogrammetry and Remote Sensing.

### **Accomplishments of the TC VII Working Groups**

#### **WG VII/1: Physical Modelling and Signatures in Remote Sensing**

The WG was a co-organizer of the joint AARS (Asian Association of Remote Sensing) and ISPRS special session entitled 'Interlinking from Asia on Global Climate Change and its Impacts – Bridging Asia and Global Communities' at ACRS 2015, Manila, Philippines.

#### **WG VII/2: DEM Generation and Surface Deformation Monitoring from SAR Data**

- Co-organizer of the joint Workshop (3D & URS) at the 34th EARSeL Conference, Warsaw, June 2014.
- Co-organizer of the joint ISPRS Workshop PIA15 + HRIGI15 in Munich in March, 2015.
- Continuation of the 'DEM Validation' project.

#### **WG VII/3: Information Extraction from Hyperspectral Data**

- The GeoHyper15 - Image Spectroscopy – Concepts, Algorithms, and Applications workshop was organized at the ISPRS Geospatial Week 2015.
- Continuation of the 'A Vicarious Calibration Project using SVC Method from Space', funded partially by ISPRS and ASI. The results of this project were presented at the GRSG 2015 meeting in Frascati, Italy, December 2015.

- Individual achievements; **i)** organization of a session on Soil and Land Information: "Emerging Technologies and Support to Decision Making" at the Global Soil Week 2015, Germany; **ii)** organization of a plenary session entitled "Remote Super Spectral and Hyper Spectral Sensing" at the AIC 2015, in Jerusalem; **iii)** collaboration with the International Spaceborne Imaging Spectroscopy Technical Committee, a part of the IEEE GRSS; **iv)** publication of some research papers and contribution to some book chapters.

#### **WG VII/4: Methods for Image Classification**

- WG officers cited as **i)** a reviewer at the ISPRS TC II Midterm Symposium 2014 in Toronto; **ii)** a member of the scientific committee at the UAV-g 2015; **iii)** a co-chair of the Program Committee involved in organizing the Third International Workshop on Earth Observation and Remote Sensing Applications 2014, China; **iv)** a member of the Scientific Committee and an invited speaker involved in organizing ISPRS Workshop on Mobility and Land Cover Change Mapping 2015, China.

#### **WG VII/5: Methods for Change Detection and Process Modelling**

- Co-organizer of the Workshop on 'Laser Scanning Applications' at the University of Cologne, in March, 2015, with the WG VII/7.
- Co-organizer of the joint workshop on **i)** Data Management with the CRC806 "Our Way to Europe" and the TR32 "SVA-Patterns", 2014; **ii)** Laser Scanning Applications with the DGPF, the CRC806 "Our Way to Europe" and the TR32 "SVA-Patterns", 2015.
- Contribution to the Special Issue of the ISPRS IJGI on "Research Data Management", 2015, and the Special Issue of the PFG on "Laser Scanning Applications", 2015, as an editor.

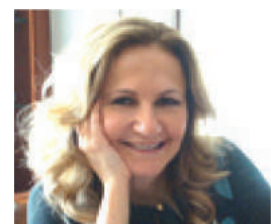
#### **WG VII/6: Remote Sensing Data Fusion**

- Organization of two workshops; **i)** Joint International Workshop on Geographic Conditions Monitoring (IWGCM) 2014, China; **ii)** 2015 International Workshop on Image and Data Fusion (IWIDF2015), USA.
- Individual achievements **i)** Promoting IJIDF, to be indexed by SCI; **ii)** Contribution to Special Issue "Remote Sensing Dedicated to Geographical Conditions Monitoring" in *Remote Sensing*, 2014; **iii)** Contribution to Special Issue "Volcano Remote Sensing" in *Remote Sensing*, 2015.

#### **WG VII/7: Synergy in Radar and LIDAR**

- Organization of "Synergy in Radar and Lidar" sessions at the Fall AGU 2014 and the ISPRS Geospatial Week 2015 meetings.
- Co-organizer of the Workshop on 'Laser Scanning Applications' at the University of Cologne in March, 2015, with the WG VII/5.
- Publication of a review article on Lidar-radar synergy in the Journal of the 'Forests' (<http://www.mdpi.com/1999-4907/6/1/252/htm>).

Filiz Sunar  
Istanbul Technical University





## COMMISSION VIII - REMOTE SENSING APPLICATIONS AND POLICIES

Technical Commission VIII focuses on the generation of satellite based information, the development of applications on remote sensing in specific themes, capacity building and institutionalization of remote sensing for absorptions by various organizations and developing policies for improved access and use of remote sensing data.

During 2014 – 2015, this commission realized these goals collectively through contributions by working group officers of Commission VIII by way of organising workshops / symposia / scientific meetings, and brought out publications etc. Most significant among them is the Midterm Symposium which was organised at Hyderabad, India, in 2014. A summary of the activities of the commission and its working groups is presented below:

### Commission Midterm Symposium

The ISPRS TC VIII Midterm Symposium on "Operational Remote Sensing Applications: Opportunities, Progress and Challenges" was organised by the Indian Society of Remote Sensing (ISRS), held at Hyderabad from 9-12 December, 2014. A total of 26 parallel technical sessions spread over three and a half days, three poster sessions and three special interactive sessions, covering various themes of operational remote sensing applications, were conducted. The Mid-term Symposium also included a joint session of TC IV-Geospatial Databases and Location Based Services and TC VI- Education, Technology Transfer and Capacity Development; a special session on Himalayan Mountain Challenges and Geospatial Solutions, conducted by ICIMOD and an ISG Special Session. A total of 540 papers were accepted for oral (288), poster (98) and special interactive sessions (144). The symposium was attended by more than 450 registered delegates, including around 100 students and young researchers who were provided free registration. Delegates of more than 50 organisations from 18 countries participated.

In addition, three pre-symposium tutorials were conducted on recent advances in the geospatial technology. The tutorials on "Hyper Spectral Data Analysis and Applications", "Polarimetric SAR Data Processing & Applications" and "Flood Monitoring & Modelling" were attended by more than 75 students and research scholars.

### Working Group activities in 2014 & 2015

WG VIII/1 Disaster and Risk Reduction organized an international workshop on "Geospatial Technology for Disaster Risk Reduction" on 17 December, 2015, at JK Lakshmipat University, Jaipur, India. The workshop aimed at promoting the development of tools and techniques that support disaster risk reduction by using remote sensing, GIS and predictive modeling techniques in support of risk assessment, detection, early warning, monitoring, damage assessment and response. About 40 papers were presented covering the various topics of DRR.

WG VIII/2 Health co-organized the eighth International Symposium on "Geospatial Health" at New Orleans, Louisiana, USA, from 31 October to 2

November, 2014. They also co-organized an invited session on "International Innovations in Geoscience and Healthography" of the American Public Health Association (APHA) at the APHA 2014 Annual Meeting and Exposition, New Orleans, Louisiana, USA, from 15-19 November, 2014. The WG published various papers including a Special Issue of the Journal of Geospatial Health on the "2nd Symposium on Advances in Geospatial Technologies for Health" and a Special Issue of the ISPRS International Journal of Geo-Information on "Remote Sensing and Geospatial Technology in Public Health".

WG VIII/3 Weather, Atmosphere and Climate Studies organised the Asia Flux 2015 workshop at IITM Pune, from 22-27 November, 2015, with more than 250 participants.

WG VIII/5 Energy & Geology Applications organized a three day international symposium on "Remote Sensing and Geomatics Applications in Asia with Special Focus on the Gulf Region", hosted by Department of Earth and Environmental Science, Faculty of Science, Kuwait University, Kuwait from 29-30 March, 2015. The symposia covered a wide range of fields such as resource assessments, hazard monitoring, marine environmental degradations, geological mapping etc. Further, this working group organised an international conference on GiT4NDM (Geo-Information Technology for Natural Disaster Management) from 8-10 Dec, 2015, in UAE.

WG VIII/6 Cryosphere organized the Mini Workshop on Sea Ice monitoring with AMSR2 in Tokyo, in January, 2015, and, as part of ACRS, in the Philippines, from 19-23 October, 2015. This working group also participated at the SCAR (Antarctic) meeting, held in Barcelona from 14-18 September, 2015, the World Congress of Oceans meeting, in Qingdao, China, from 6-8 November, 2015 and the AGU fall meeting from 14-18 December, 2015. WG VIII/6 is closely associated with IEEE, the Remote Sensing Society of Japan (RSSJ), the International Glaciological Society, the American Geophysical Union, and NASA's IceSat-2 and Ice Bridge programs.

WG VIII/7 Forestry, Natural Ecosystems and Biodiversity organized a three day international conference on "Intelligent Earth Observing and Applications (2015 IEOAs) at Guilin University of Technology (GUT), Guilin, Guangxi, China, from 23-24 October, 2015.

WG VIII/9 Coastal and Ocean Applications co-chaired sessions at the 2014 Ocean Sciences Meeting, Hawaii, USA, and at the Asia Oceania Geosciences Society Meeting in Japan, in 2014.

I take this opportunity to express my gratitude and complement all the working group officers and all others in India and abroad, without whom it would not have been possible to accomplish the tasks of the commission. I also invite all the WG Officers of Commission VIII and all others who are actively involved in 'Remote Sensing Applications and Policies' to contribute papers and participate actively in the ISPRS Congress 2016. See you all in Prague.



Vinay Kumar Dadhwal, National Remote Sensing Centre, Hyderabad

## STUDENT CONSORTIUM (SC)

The ISPRS Student Consortium is a network for young professionals studying or working within the fields of photogrammetry, remote sensing, GIS, and other related geo-spatial sciences. The main goal of the network is to provide means for information exchange for its young members and thus help promote and integrate youth into the ISPRS. Over the past two years the Student Consortium has successfully continued to fulfill its mission in both formal and informal ways. The network's formal means of communication are its website, newsletter, e-mail announcements and summer schools, while its informal ones are multiple social media outlets and various social activities during student related events.

The Student Consortium website ([www.isprs-sc.org](http://www.isprs-sc.org)) operates as a platform to disseminate information relevant to youth and student activities. Information is distributed to the network's members either through the website or an email list. Up to now 1341 members have been registered, among which 1081 are subscribed to the email list. The number of subscriptions has increased from 875 to 1081 members since 2014.

In addition to the website, the Student Consortium uses popular social media outlets such as Facebook, LinkedIn, and Twitter. The LinkedIn and Twitter groups have around 150 followers each; however, the Facebook group currently has over 4,500 subscribers and is a lot more active. The subscribers connect among one another and share information relevant to their professional careers (e.g., news, events, general knowledge, and job/study opportunities). Approximately five to ten posts per week are observed in the stream of the Facebook group. These numbers show that the Student Consortium has grown into a significant online-united community.

The Student Consortium Newsletter is published every three to four months and provides both technical content and content related to work experience and/or student exchange opportunities relevant for the young people in the ISPRS. The Newsletter is prepared and published entirely by an international group of students and young professional volunteers. Eight issues have been published since 2014. In addition to digital publishing, once a year in a major ISPRS student event such as a Student Consortium summer school, a number of hard copies of the Newsletter are printed and distributed among the participants. Printed copies were distributed during the summer school in Myanmar in 2014 and in the Philippines in 2015. Typically the printed issues are devoted to the theme of the corresponding summer school. In 2014, a double thematic issue of the Newsletter was published, focusing on women in the sciences and engineering, where the contributions were by and/or about females.



Cover page of the ISPRS Student Consortium Newsletter Vol. 9, Issue No. 2 – October 2015

In the last eight issues of the Newsletter, around thirty international, regular and temporary contributors gave their support by sending event reports, interviews or articles, which were published under the creative commons license. On average one event report is usually published per issue. Likewise, every issue of the Newsletter contains an interview with typically a professor giving first-hand perspective on new projects or activities. In addition, space is allocated for technical articles on currently popular topics, and non-technical articles related to personal experiences in order to encourage and broaden the horizon of the readers. In the last quadrennial period, a new section devoted to scholarships was added to the regular sections of the Newsletter in order to spread different career building opportunities all around the world. The Student Consortium Newsletter is a great opportunity for both contributors publishing articles about their research and the Newsletter team working in a cooperative international environment.

The primary purpose of the summer schools is to provide a series of lectures and intensive training on recent advances in remote sensing and other geospatial information sciences. In addition, these summer schools provide opportunities for students and young scientists to gather, exchange information, and expand their professional network. Moreover,



Group photo taken at the 13<sup>th</sup> ISPRS Student Consortium summer school in the Philippines

the summer schools allow the participants to interact spontaneously through technical visits and social events. In 2014-15, three summer schools were organized in Asia. The 11th summer school was organized in Wuhan, China together with Wuhan University and ISPRS Technical Commission VI. This summer school hosted over a hundred participants, both local

and foreign, and focused on three major topics in remote sensing and the geospatial sciences. The 12th summer school in 2014 was organized at the University of Yezin, Myanmar, right after ACRS 2014. This summer school discussed relevant topics in remote sensing and geospatial technologies as applied to forestry. In 2015, the Philippines hosted 60 foreign and local participants for the 13th summer school. Various topics for natural resources management were discussed, including open source mapping methodologies, LiDAR and radar remote sensing techniques.

Numerous teleconferences and internal meetings took place between the members of the Student Consortium board and the WG VI/5 leaders since the beginning of 2014.

Written by: Ivan Datchev, Hiroyuki Miyazaki, Ayda Aktas, Sheryl Rose Reyes, and Urša Kanjir

Urša Kanjir  
Student Consortium Chair





## REGIONAL REPRESENTATIVE AFRICA

The major activities during the reporting period were organizing and attending ISPRS events, workshops and conferences that support the objectives of ISPRS and membership drive. The details of the activities are as follows:

### **10<sup>th</sup> ISPRS WGVI/5 and Student Consortium Summer School**

The 10<sup>th</sup> ISPRS Student Consortium & WG VI/5 Summer School was successfully held from 29 October to 2 November, 2013, at the UN Economic Commission for Africa (UNECA) Headquarters in Addis Ababa, Ethiopia. The local organizing committee composed of personnel from the Regional Centre for Mapping of Resources for Development (RCMRD), Ethiopian Mapping Agency (EMA) and UNECA.

The summer School brought together 30 young scholars and scientists from 10 Countries; Rwanda, Uganda, Tanzania, Ethiopia, Nigeria, Kenya, Turkey, Slovenia, Switzerland and the United Kingdom. The main theme focused on 'Geospatial Science for Monitoring of Environment for Sustainable Development' and the following topics were covered:

- Change Detection
- Food Security
- Agriculture Monitoring
- Land Cover / Use
- Disasters Monitoring

The training schedule comprised of lectures and practical sessions on the use of Synthetic Aperture Radar (SAR) data for various application, ENVI software for change detection and disaster monitoring using earth observation.

Participants enjoyed a technical visit to EMA, a visit to the National Museum of Ethiopia and a cultural night of Ethiopian delicacies and dances.

### **GSDI 14/AfricaGIS Conference**

The Global Spatial Data Infrastructure and AfricaGIS (GSDI 14/AfricaGIS2013) conferences were jointly held in Addis Ababa from 30 October to 4 November, 2013. The Secretary General of ISPRS and the ISPRS Regional Representative for Africa attended the conference.

During the AfricaGIS2013/GSDI14, AfriGEOSS was launched. AfriGEOSS is an initiative by the intergovernmental Group on Earth Observations (GEO) aimed at building infrastructural capacities in Africa to benefit from geospatial data for sustainable development. AfriGEOSS is designed to support the continent's efforts to bridge the digital divide and build a knowledge-based economy, by enhancing Africa's capabilities for producing, managing and using earth observation data and information. The ISPRS Regional Representative for Africa is also the regional coordinator for AfriGEOSS in Eastern Africa.

The GEO Working Group on Land Cover for Africa was also launched during the Conference. The ISPRS Regional Representative for Africa was elected as the Chair of the executive board of the working group. The pur-

pose of the working group is to contribute to the development of a land cover data product for the entire African continent at a 30 meter resolution for the African element of the Global Earth Observation System of Systems (AfriGEOSS). This will be established by building mutually beneficial partnerships with national and regional institutions to assess and develop their land cover needs, including products, while increasing their involvement in the Global Land Cover Database.

#### **AARSE Conference 2014**

The African Association of Remote Sensing of Environment (AARSE) was held in Johannesburg, South Africa from 27 to 31 October, 2014. The AARSE2014 conference focused on “Space Technologies for Societal Benefits in Africa”. This event is the largest and premier forum in the African continent for researchers on remote sensing technologies and geospatial information science, gathering leading scholars from the remote sensing and related communities.

The Second Vice President of ISPRS, Prof. Marguerite Madden gave a key note address titled *Remote Sensing in a Changing World: Can we Serve Society from Local to Global Scales?* The ISPRS Regional representative for Africa attended the conference and promoted the objectives and activities of ISPRS.

#### **ISPRS Technical Commissions and Working Groups events**

ISPRS Technical Commissions and Working Groups are hereby encouraged to organize events (seminars, workshops, special sessions) in Africa. These are best organized as special sessions, pre-conference or post-conference events during the biennial conference of the African Association of the Environment (AARSE) (October of even numbered years) or that of AfricaGIS (around October of odd numbered years). For more information, please contact the ISPRS Regional Representative for Africa.

#### **Planned Events in 2016**

RCMRD, together with its partners is organizing two training events on the use of SAR data and its applications in environmental monitoring and food security in Kenya and Rwanda. The objectives of the two events are to:

- Expose university students and faculty to remote sensing applications
- Impart more knowledge on remote sensing technology and applications
- Develop professional connections and a platform to meet and interact with international and local experts in the field of remote sensing.

The Kenya event will be held at Kenyatta University from 25 to 29 April, 2016. The Rwanda event will be held from 22 to 26 August, at National University of Rwanda, Butare.

Hussein Farah  
African Regional Representative



## REGIONAL REPRESENTATIVE LATIN AMERICA

### **State of the Art of Remote Sensing and Photogrammetry in Latin America**

The Latin American Earth Observation (EO) area is undergoing significant expansion, brought about by growing demand for EO applications and therefore associated data and services. In this regard, the region is considered one of the most dynamic markets globally. Latin America EO capabilities are expected to increase substantially as further countries in the region are investing in the application, and current investing countries expand their satellite portfolios. Demand for EO data is also increasing significantly.

Main areas of application are the monitoring of natural resources (e.g. forest monitoring programs, especially in Brazil and Mexico), natural disasters, and land use cover. Recently, climate change related issues, as well as associated adaptation are beginning to gain importance.

In the area of remote sensing, the current trends in the region are:

- Demand for applied remote sensing
- Demand for capacity building
- Demand for data access (as much as possible free access).

Recently, new emerging space agencies have started to strengthen the use of remote sensing in support of governmental demands. Countries such as Mexico, Peru, Ecuador, Colombia, Venezuela are now setting up national space agencies or do have specific governmental institutions devoted to Earth Observation. In parallel, INPE (Brazil) and CONAE (Argentina) have been increasing their associated EO capabilities.

In the area of photogrammetry, applications using UAVs and laser scanning are increasing. In general, the users are making use of the various mapping and 3D algorithms provided with the sensor-device (UAM or Laser Scanner). Recently, Colombia has been elected as President of the Inter-American Commission for the Registry of Property and Survey (Cadastral). The main activity is now with the Institute Agustín Coddazi. This may be a good opportunity for ISPRS to showcase its know-how in photogrammetry in the region. The main problem is to find the funds in order to organize a support workshop inviting technicians and decision makers of the region.

Based on this brief assessment, in relation to ISPRS in Latin America, (and without implicating that all other Commissions have no relevance), the following ISPRS Commissions have larger possibilities for action: Commissions IV, V, VI and VIII.

### **Promoting ISPRS among Latin American institutions**

The Regional Representative participated in the following international meetings and promoted ISPRS:

- International Symposium on Remote Sensing of Environment (ISRSE), Berlin, May 2015
- GEO Ministerial meeting, 9-13 November, Mexico City

### **Bringing ISPRS to Latin America**

In Latin America the following activities were carried out to support ISPRS:

- Workshops on Digital Documentation of Cultural Heritage: Advantages and Disadvantages, Mexico City, 27 April 2015 and Campeche, Mexico City, 30 April and 1 May, 2015, in association with the University of Ghent and UNESCO.
- Workshop on Promoting the Use of Satellite Data to Support National Environmental and Climate Change Decision-making in the Caribbean, 3-5 December, Kingston, Jamaica, jointly with the University of Ghent and UNESCO-Kingston.

### **ISPRS involvement with ICSU-Future Earth**

With ISPRS support, the Regional Representative was selected for the Future Earth Scientific Engagement Committee. Working as Ambassador of Remote Sensing and Photogrammetry, he has been able to convince Future Earth of the vital importance that the themes of ISPRS do have for Future Earth. Remote Sensing and Photogrammetry are now official themes of Future Earth and will be used in all Future Earth projects.

### **Recommendations to ISPRS**

While Latin America is actively teaching remote sensing and photogrammetry in universities, there are no incentives to encourage research in these areas. Therefore, most of the students emerging from the universities begin working on applications in the various governmental institutions. In general, this poses the main problem for ISPRS: the region focuses more on applications, as compared to research. This does not mean that ISPRS does not have opportunities in Latin America, but that ISPRS has to have a presence in Latin America with experts showing the new trends of remote sensing and photogrammetry who mainly demonstrate how these new developments are being used in concrete applications.

Therefore it is suggested that ISPRS organize an event in Latin America every two years. The form of the event has still to be defined (e.g. a Geo-spatial Week).

Mario Hernandez  
Latin American  
Regional Representative





## REGIONAL REPRESENTATIVE SOUTH-EAST ASIA

The Regional Representative for South-East Asia in the period of 2012 - 2016 conducted various activities to promote ISPRS in the region. In the position of AARS Deputy General Secretary, the RR continuously supports ISPRS by arrangement of various meeting, seminars and summer schools.

Summer schools following the annual Asian Conference of Remote Sensing are an excellent example of collaboration between AARS and ISPRS, to promote ISPRS in Asia and SEA region. The 8<sup>th</sup> ISPRS Student Consortium and the WG VI/5 Summer School were organized from Nov. 30 to Dec. 4, 2012, at Burapha University, Chonburi, Thailand. The ISPRS – ACRS Summer School 2013 was organized in Werdhapura Village Center, Indonesia, from 25 to 30 October, 2013. The ISPRS-ACRS Summer School 2015 was organized at the University of the Philippines, Diliman, Quezon City, Philippines from 24 to 28 October, 2015.



Participants of the 9<sup>th</sup> GI4DM

The 9<sup>th</sup> International Conference on Geo-information for Disaster Management 2013 (GI4DM2013) was successfully held at the Institute of Geography, Vietnam Academy of Science and Technology, from 9 to 11 December, 2013. 90 participants from 18 countries participated in the conference.



ACRS 2015  
Attendees from  
Vietnam supported  
by the Swiss-  
Vietnam project



Prof. Christian Heipke - ISPRS General Secretary explaining about the ISPRS mission



Participants of the workshop

In 2014, a scientific collaboration project between the Institute of Geography and the Swiss Federal Institute of Technology, ETH, Zurich, was initiated with the support of ISPRS, AARS and the Asian Institute of Technology, AIT. The project supported 9 participants from Vietnam, to attend the Asian Conference on Remote Sensing held in Manila, Philippines, from 18 to 23 October, 2015.

In the framework of this project, a workshop titled “Modern Trends of Photogrammetry and Remote Sensing” was organized in Hanoi on Oct. 16, 2015. 45 participants from Vietnam and Laos PDR participated in the workshop.



Nguyen Dinh Duong  
South-East Asian  
Regional Representative

## GEOSPATIAL WEEK 2015

France hosted the ISPRS Geospatial Week 2015, which was held in La Grande Motte near Montpellier (France), from 28 September to 2 October. This Geospatial Week was organised by the French Society of Photogrammetry and Remote Sensing (SFPT) together with the French National Institute of Geographic and Forest Information (IGN-France), the French National Research Institute of Science and Technology for Environment and Agriculture (IRSTEA) and the French National Forests Office (ONF). The event attracted more than 500 participants from 52 countries. The program was composed of 11 independent events running in parallel during the week: Laserscanning, Silvilaser, CMRT, ISSDQ, ISA, Gi4DM, GeoBigData, GeoVis, GeoUAV, GeoHyper and RSDI. Some of the hosted events were well-established within ISPRS, supported by active Working Groups, and others were renowned non-ISPRS conferences and workshops. There were also some new events, on emerging topics, sometimes co-organised with sister societies (ICA).

The objective of the Geospatial Week (GW) was to propose a very rich scientific program dealing with all aspects of GeoInformation, from data collection and information extraction, to data quality control and dissemination through services. The mix of methodology-oriented and thematic-oriented events allowed the audience to have a rare glimpse of current state-of-the-art techniques and applications.

350 papers were submitted to the different events and most of them went through a double-blind review process. The papers were assigned to various members of the scientific committee of the event by the event chairs. 36 co-chairs handled the papers, distributed to 215 reviewers and collected more than 700 reviews in total. The full reviewing process was supervised by Clement Mallet, the Program Chair. In order to efficiently address all scientific issues raised by event chairs during this 8-month process (from important date setting up to proceeding publication) and in order to build a rich and coherent program, a scientific committee was created. It was composed of one representative per event, ISPRS advisors, the Event and Program Chairs, and chaired by the Chair of the International Scientific Advisory Committee (ISAC), namely Ian Dowman.

The papers are now published in the ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences (Vol. II-3/W5) and Archives (Vol. XL-3/W3) of Photogrammetry, Remote Sensing and Geospatial Sciences and are accessible online on the ISPRS website ([www.isprs.org](http://www.isprs.org)). Each of these two volumes is divided into sections corresponding to the respective contributions of each event. It is accompanied with a specific preface providing additional details about the reviewing process. Furthermore, event chairs invited the authors of the most salient works of their event to extend their contribution for a Special Issue to be published next year in the ISPRS Journal of Photogrammetry and Remote Sensing.

The format of the GSW included four plenary sessions that were not organized by the individual events and could be attended by all GSW participants. It also allowed for joint keynote sessions of some of the



workshops, in order to stimulate cross-fertilization of the communities involved. The four plenary speakers were Mike Wulder (Canadian Forest Service, Canada) on lidar and satellite-based forest management, Konrad Schindler (ETH Zurich, Switzerland) on the interleaved issue on building reconstruction and semantization from airborne oblique imagery, Simon Lacroix (LAAS, CNRS, France) on environment perception for autonomous mobile robots and Elmar Eisemann (TU Delft, The Netherlands) on computer graphics and visualization techniques from environmental issues.

The program also composed of 19 keynote talks, sometimes shared between events. These distinguished speakers gave a very interesting and un-precedented overview of the state of the art and trends within a wide range of areas, including 3D city modelling, multi-temporal and hyperspectral remote sensing, lidar forestry applications, UAV photogrammetry, object tracking, data quality, emergency mapping, big data processing, computer graphics and spatial data infrastructures.

The oral sessions, running either single-tracks or in parallel, were accompanied by two poster sessions and an industrial exhibition. The poster sessions took place within the industrial exhibition, hosting nine stands (IGN, ONF, MOMRA, 1SPATIAL, HARRIS, LOT QUANTUM DESIGN, GEOSYSTEMS FRANCE, YELLOWSCAN, POSITICS).

Again, in order to foster idea sharing, benchmark organisers were invited to present their datasets and the outcomes of their contest. A student poster competition was also organised. It enabled 12 MsC and early PhD students to experience a scientific conference by presenting their ideas and first achievements to attendees, and in support of their initiation within their community. Free registration, gala dinner and poster printing were offered to the awardees.

Twelve travel grants, awarded by the ISPRS foundation and UNOOSA, allowed students and young scientists coming from eleven countries across the world to present their work during the ISPRS Geospatial Week.

During the GSW 2015 the decision was taken to hold the next Geospatial Week in China, organised by Wuhan University. A strong Chinese delegation submitted a winning application to the panel and was successful with their bid. The ISPRS Geospatial Week 2017 will take place from Sept. 18 - 22, 2017.

Nicolas Papanoditis  
Director, Geospatial Week 2015





## THE INTERNATIONAL COMMITTEE ON REMOTE SENSING OF ENVIRONMENT (ICORSE)

The International Committee on Remote Sensing of Environment (ICORSE) is a standing ISPRS subcommittee. The ICORSE membership is composed of representatives from Earth science, geospatial, and environmental agencies of countries represented in ISPRS. The ICORSE goal is to advance the use of remote sensing to address priority issues of the environment including scientific, policy, management, and other pursuits. The primary function of ICORSE is to oversee the biannual International Symposium on Remote Sensing of Environment, ISRSE.

The 36th International Symposium on Remote Sensing of Environment (ISRSE-36) took place on 11-15 May, 2015, in Berlin, Germany. The German Aerospace Center (DLR) hosted this highly successful and productive symposium. Highlights of the event included:

- 738 participants from 66 countries
- 81 technical sessions across 12 themes, incl. seven special sessions
- 415 oral presentations and 167 posters
- 29 keynote contributions in five plenary sessions
- three social events and one technical tour.

Abstracts of all accepted submissions are available at the ISPRS website. The ICORSE met on 12 May, 2015, in Berlin in association with ISRSE-36. Per-Erik Skrovseth (Norwegian Space Center) stepped down as ICORSE Chair, and the Committee elected Lawrence Friedl (NASA) as the new Chair. In addition to a review of ISRSE-36, the Committee addressed four primary topics. The Committee discussed three offers to host ISRSE-37 in 2017, and it accepted the offer of the South African National Space Agency (SANSA) to host the symposium at the Council for Scientific and Industrial Research (CSIR) in Tshwane (Pretoria). The Committee and SANSA decided to identify opportunities to co-locate other meetings with the symposium, particularly those of the Group on Earth Observation.

In addition, the Committee addressed the 2016 ISPRS Congress and General Assembly, including a discussion with Congress Chair Lena Halounová on ICORSE support for the planned Space Agency Forum. ICORSE agreed to develop a prospectus with ISRSE and distribute it to ICORSE member agencies. The Committee reviewed its terms of reference and decided to update them. Based on a series of meetings in 2015 with ISPRS Executive Director, the Committee discussed the relationship of ICORSE and the symposium to ISPRS overall, looking to strengthen ties and mutual benefits.

In the coming years, the Committee will pursue additional members and consider the Symposium as a venue to showcase the use of remote sensing in relation to the 2030 Agenda and the sustainable development goals.



Lawrence Friedl, Chairman, ICORSE

## INTERNATIONAL COMMITTEE FOR DOCUMENTATION OF CULTURAL HERITAGE (CIPA)

The International Committee on Heritage Documentation (CIPA) held its annual meeting in Riva del Garda, Italy at the time of the ISPRS Commission V Symposium. The board held one meeting and discussed internal business, the finalization of the webpage, workshops and summer schools, financial planning, outreach activities, planning of future activities and joint events with other organizations and committees of ICOMOS and ISPRS. The activities concerning the next International CIPA Symposium, to be held in Taipei, Taiwan, were discussed and presented by the Symposium Director.

CIPA has clearly defined missions:

- To promote recording, documentation, information management and monitoring of cultural objects, monuments, groups of buildings and their environment, villages, towns, sites and cultural landscapes by the means and further development of applications of traditional surveying methods, photography, photogrammetry, laser scanning, remote sensing information technology and management, including and integrating related disciplines and techniques.
- To actively pursue programs which define research needs, stimulate and support research activity, and increase exchange and dissemination of relevant information in order to promote a greater understanding in the discipline.
- To actively pursue international co-operation in that domain with:
  - the Commissions and Members of ISPRS,
  - the other International Scientific and National Committees of ICOMOS, specially with respect to ICOMOS' tasks and needs for UNESCO's Cultural Heritage Division and World Heritage Centre, - other co-operation partners of ICOMOS, for example ICCROM, ICOM, IUCN, DOCOMOMO,
  - other international bodies.

As can be seen from previous reports, CIPA is one of the most active scientific committee in ICOMOS, with several volumes of publications and activities organized in the promotion and implementation of adequate scientific research and practice in the field of heritage documentation. For the upcoming plans, CIPA is involved in the publication and organization of activities internationally. Therefore, the executive board did not see the necessity to formulate a working programme.

CIPA organized and/or embarked on the following events/activities:

- 1st CIPA Summer School, Paestum, Italy, July 2014
- CHCD Symposium + Summer School, Beijing, China, August 2014
- CIPA event during ICOMOS GS, Florence, Italy, November 2014
- MoU, ITN-DCH (2014)
- Provide letters of support for European and international research programme proposals.

### Further Events

- The 25th CIPA Symposium, held in Taipei, Taiwan, in August-September 2015.

CIPA decided to support/co-organize the following events:

- 3D-ARCH'2015 “3D Virtual Reconstruction and Visualization of Complex Architectures”, held in Avila (Spain) in February 2015.
- ISPRS/CIPA workshop “Underwater 3D Recording and Modelling” held in Napoli (Italy) in April 2015.
- 2nd CIPA Summer School “Cultural Heritage 3D Surveying and Modelling”, held in Paestum (Italy) in July 2015.
- Workshop on Syrian Heritage in conjunction with the ICAANE Symposium in Vienna (Austria) in April 2016.
- 3rd International Symposium on Cultural Heritage Conservation and Digitization, to be held in Beijing (China) in September 2016.
- ARQUEOLÓGICA 2.0 - 8th International Congress on Archaeology, Computer Graphics, Cultural Heritage and Innovation (September 2016).

### Recent Publications

The 24th Symposium proceedings from Strasburg can be downloaded free of charge from the CIPA website <http://cipa.icomos.org/>. They are also available from the ISPRS publications web page.

The CIPA Heritage Documentation movie can be found on CIPA webpage.

CIPA is active on various social media.

The CIPA Newsletter appears every four months since 2014 and now it is in its 6th edition. It can be found on CIPA web page.

### Partners

The main cooperation is that with ISPRS. The cooperation is defined by the CIPA Statutes, controlled by Society Delegates. CIPA has the status of a permanent ISPRS Committee as well as of an International Scientific ICOMOS Committee. Historically, CIPA is also an ICOMOS International Scientific Committee with fruitful cooperation with its other ISCs. CIPA is attempting to attract Sustaining Members in order to support its activities.



Andreas Georgopoulos  
CIPA President

## UNGGIM-ISPRS PROJECT: "GLOBAL STATUS OF MAPPING"

Shortly after the United Nations Economic and Social Council UNE-COSOC has established the "United Nations Global Geospatial Information Management UNGGIM" under a Secretariat in the UN Statistics Division, ISPRS offered to undertake a joint project to continue with the survey of the Global Status of Mapping, an activity which had been undertaken by the UN Secretariat New York between 1964 and 1986, but which had been inactive since. The revived activity was suggested by a resolution to UNECOSOC of UN-PCIDEA in 2009 to continue with the activities.

The project began with the design of a questionnaire in 2012, which was sent out by the UNGGIM Secretariat to the UN Member States. It consisted of 27 questions requesting information on the current state of authoritative topographic mapping data at the scale ranges of 1:25 000, 1:50 000, 1:100 000 and 1:250 000 and the age of these datasets. In addition, a number of additional questions were directed to characterize the mapping infrastructure of the respective UN member countries, such as restrictions of the data to the public, charges imposed for obtaining the data, updating strategies in the mapping administrations, the use of orthoimagery as map substitute for shortening the information gap caused by duration of mapping projects, the use of high resolution satellite imagery for mapping and map updating, the interest in 3D products and the existence of a cadastral map and data base and the distribution of map products via the internet.

Altogether, 115 UN member countries have answered the questionnaire out of the 193 UN member countries. This was considered a success by UNGGIM with respect to obtaining global general infrastructure information.

With respect to the global data coverage at the different scale ranges, other agencies had to be contacted, such as the company Eastview in Minneapolis, USA, the State Library in Berlin and other libraries, to obtain a realistic assessment of the global coverage and the age of the data for all 193 UN Member countries and for about 30 additional regions of the globe.

The completed study has been printed in a 64 page publication which was distributed at the UNGGIM Conference in August 2015 in New York and which is available on the Internet under [www.isprs.org](http://www.isprs.org) and on websites of UN Geo and UN GGIM.

In 1986, 49.3% of the globe was covered by 1:50 000 maps which, on a global average, were next to 50 years old. In 2012, the 1:50 000 data coverage is 81.4% with an average age of 26.3 years. This demonstrates the good progress by made by new technology in the last 26 years.



Gottfried Konecny



## ISPRS SCIENTIFIC INITIATIVES 2015

In accordance with the statutory mission and activities of ISPRS, the Society provides funds to support scientific and other initiatives, which will further improve its international status in the field of the photogrammetry, remote sensing and spatial information sciences, and will therefore benefit all ISPRS members. To this end, a call for new ISPRS Scientific Initiatives was issued in October 2014 and 11 teams of researchers from working groups across all of the eight ISPRS Technical Commissions submitted applications. Comments were sought from the relevant Technical Commission Presidents, and a sub-committee of three Council members was convened to independently review the proposals on the basis of scientific excellence. The sub-committee's recommendation to fund seven projects to a total of CHF 33,000 Swiss Francs was accepted by ISPRS Council at its 2014 meeting in Hyderabad. The following briefly describes the outcomes of each project, with full reports available on the ISPRS website.

- Completion of the ISPRS Benchmark for Multi-platform Photogrammetry  
 PI: Francesco Nex; FBK Trento, Italy  
 This project, conducted in conjunction with EuroSDR, aimed to collect and share state-of-the-art data over urban areas to assess the performance of image orientation and matching algorithms in the handling of images captured from different platforms. Oblique aerial images, UAV and terrestrial data of two selected areas have been acquired and processed for delivery to participants. The city center of Dortmund and the area of the Zeche Zollern Museum (Dortmund, Germany) were chosen as test fields. Due to the large amount of data, different scenarios have been established for the orientation and matching tasks. The orientation and matching algorithms are assessed using reference points, Terrestrial and Airborne Laser Scanning that have also been acquired. The benchmark is now ready for participants, with many researchers having already downloaded the data. Their results will be published on a dedicated webpage.
- ISPRS Open Data Challenge 2015  
 PI: Qing-Quan Li; Shenzhen University, China  
 Lasting for over five months, the 2015 ISPRS Open Data Challenge started in June 2015 and concluded in December 2015, with 59 teams from China, Hong Kong, Japan, USA and the UK participating. The challenge released the GPS trajectories of over 1,000 buses, as well as millions of records for associated transit smart cards. The top-10 teams from a qualification round obtained a copy of the dataset and were invited to attend the final of the competition where they had to design creative projects using the data and any other open source data and software. In the final, seven experts from transportation, computer science, and IT companies were invited as judges. The team from Zhejiang University of Technology (RunBunny) won the first prize, two

teams (Vi-Yoghourt, WHUGCM) shared the second place prize, and three teams (Moonlight, TYUT\_GIS\_LAB, and Mango) shared third place. The challenge also open sourced the codes and algorithms from the top-10 teams in the qualification round at GitHub: <http://citysensing.cn/opencup/opensources.html>. For more information about the 2015 ISPRS Open Data Challenge, please visit the Challenge website: <http://citysensing.cn/opencup/home.html>.

- ISPRS Benchmark on Urban Object Detection and 3D Building Reconstruction  
 PI: Markus Gerke; University of Twente, The Netherlands  
 A major yet unsolved research topic in photogrammetry and remote sensing is automated extraction of urban objects from high-resolution data. This project aimed at promoting 2D semantic segmentation that assigns object-class labels of multiple relevant urban categories to image pixels. It can be considered as a first step towards the long-term goal of completely automating mapping. In the first year of this project, the Vaihingen data set was prepared and the 2D semantic labeling challenge was launched. In the second year, the major labor work went into the creation of data for the extension of the 2D semantic labelling benchmark for Potsdam, Germany. As of mid-December 2015, 20 submissions were made for the Vaihingen dataset, and two for the Potsdam semantic labeling challenge.
- Global Status of Land Cover Mapping and Geospatial Database Updating  
 PI: Gottfried Konecny; Leibniz Universität Hannover, Germany  
 Since 2012, ISPRS WG IV/2 has concentrated its efforts on a global survey of topographic mapping and geodatabase updating, initiated by ISPRS in cooperation with UNGGIM at the UN Statistics Division, New York. A questionnaire comprising 27 questions was sent to all UN member states and 115 responses were received. For each of the 27 questions, an interactive viewer was programmed permitting analysis of the results. The project concluded with the publication of the final report in 2015 and the delivery of the database to UNGGIM and GEO.
- Advances in the Development of an Open-source Photogrammetric Tool  
 PI: Diego González-Aguilera; University of Salamanca, Spain  
 Photogrammetry is facing new challenges and changes and the Scientific Community is replying with new algorithms and methodologies for the automated processing of imagery. However, such advances are often limited to in-house research activities due to the intrinsic difficulties of reliably and efficiently implementing such solutions and/or the prior theoretical knowledge required for a proper use. Therefore non-expert users outside the field of photogrammetry have difficulties to access these solutions and apply them to their specific applications to support their problem solving and decision making.

With the aim of providing a solution in this context, an open photogrammetric platform, called GRAPHOS (inteGRAtedPHOtogrammetric Suite), has been developed. GRAPHOS facilitates the creation of dense and metric 3D point clouds from images and it encloses robust photogrammetric and computer vision algorithms with the aim of achieving increased automation and flexibility, as well as improved quality. Last but not least, the educational component has been reinforced with didactic explanations about algorithms and their performance. The expert user is able to test different parameters and configurations in order to assess and compare different approaches.

- Assessment of Learning Pedagogy in GeoInformatics

PI: Anjana Vyas; CEPT University, India

New technology plays a vital role in education and training. The use of this technology in the natural and built environment helps to improve quality of life. This project has studied the prevailing pedagogy of learning and discussed the issues and challenges against theories and practices for academic institutions, students, and the geospatial industry.

- A Method for Vicarious Radiometric Calibration of Orbital Hyperspectral Sensors

PI: Eyal Ben Dor; Tel Aviv University, Israel

To make effective use of satellite hyperspectral remote sensing (HRS), data must first be converted into physical and chemical properties to enable a quantitative analysis. As HRS sensor performance may vary in time and space, a vicarious calibration (VC) method to retrieve reliable and accurate at-sensor radiance values is needed. This research has led to the development of VC via a unique method for assessing cross-calibration/validation of space-based hyperspectral data. Best practices for cal/val campaigns were promoted and a protocol on how to evaluate and correct possible radiometric drift in orbital HRS sensors was developed. The study involved the use of airborne and spaceborne data, as well as the preparation of special ground targets composed of agricultural nets with varying densities to simulate radiance intensity. Two areas in the desert region of Israel were selected to examine the VC methodology. The results showed a promising capability to assess the quality of HRS data, as well as to rectify the data by radiance correction, thereby generating better thematic products.

The total ISPRS funding of Scientific Initiatives for 2014 and 2015 exceeded 80,000 Swiss Francs. Reports on projects funded by the 2014 Scientific Initiative call can also be found on the ISPRS website.

Jon Mills  
ISPRS Treasurer  
University of Newcastle



# ISPRS EVENTS AND PUBLICATIONS SINCE THE XXII ISPRS CONGRESS 2012 IN MELBOURNE

| Event   | Date/Place                                 | Publication                                  |
|---|--|--|
| WG V/4<br>3D-ARCH 2013 - 3D Virtual Reconstruction and Visualization of Complex Architectures                                   | 25-26 Feb 2013<br>Trento, ITALY            | Archives Vol. XL-5/W1                        |
| WG V/3<br>The Role of Geomatics in Hydrogeological Risk   | 27-28 Feb 2013<br>Padua, ITALY             | Archives Vol. XL-5/W3                        |
| ICWG IV/II/VIII<br>The 3rd International Workshop on High Resolution Global Land Cover Mapping                                  | 27-28 April 2013<br>Beijing, CHINA         | -  |
| WG IV/2<br>ISPRS Workshop Global Geospatial Information   | 25 April 2013<br>Novosibirsk, RUSSIA       | -  |
| WG I/4, III/4, IV/2, VII/2<br>ISPRS Hannover Workshop 2013 - High-Resolution Earth Imaging for Geospatial Information 2013      | 21-24 May 2013<br>Hannover, GERMANY        | Archives Vol. XL-1/W1                        |
| WG III/4<br>VCM 2013 - ISPRS International Workshop on 3D Virtual City Modeling   | 28-31 May 2013<br>Regina, CANADA           | Annals Vol. II-3/W1                          |
| WG IV/7<br>UDMS 2013 - 29th Symposium of the Urban Data Management Society  | 29-31 May 2013<br>London, UK               | Archives Vol. XL-4/W1                        |
| WG II/1, II/2, II/4, II/6, IC WG II/IV<br>8th International Symposium on Spatial Data Quality                                   | 30 May - 1 June 2013<br>HONG KONG          | Archives Vol. XL-2/W1                        |
| WG II/7<br>Joint special session:<br>Spatial Approaches for Transportation Decision-Making                                      | 14 Aug, 2013<br>Shenzhen, CHINA            | -  |
| WG VII/6<br>3rd International Workshop on Image and Data Fusion   | 20-22 Aug 2013<br>Antu, CHINA              | Archives Vol. XL-7/W1                        |
| WG VIII/2<br>2nd Symposium on Advances in Geospatial Technologies for Health  | 25-29 Aug 2013<br>Arlington, Virginia, USA | -  |
| TC V<br>XXIVth CIPA Heritage Documentation Symposium  | 2 - 6 Sept 2013<br>Strasbourg, FRANCE      | Archives Vol. XL-5/W2<br>Annals Vol. II-5/W1 |
| ICWG I/Vb<br>UAV-g  | 4-6 Sept 2013<br>Rostock, GERMANY          | Archives Vol. XL-1/W2                        |
| WG VII/5<br>UAV-based Remote Sensing Methods for Monitoring Vegetation  | 09 - 10 Sept, 2013<br>Cologne, GERMANY     | -  |
| WG VI/6<br>International Workshop on Advanced Geospatial Technologies for Sustainable Environment and Culture                   | 12-13 Sept. 2013<br>Pokhara, NEPAL         | -  |
| WG I/4, II/4<br>SMPR 2013 - 2 <sup>nd</sup> International Conference on Sensors and Models in Photogrammetry and Remote Sensing | 5-8 Oct.2013<br>Tehran, IRAN               | Archives Vol. XL-1/W3                        |
| WG IV/8<br>Advances and Activities in Planetary Mapping and Databases   | 11-12 Oct. 2013<br>Moscow, RUSSIA          | -  |

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| WG VIII/1<br>Joint Workshop with ACRS  | 20-24 Oct, 2013<br>Bali, INDONESIA          | -  |
| WG I/4, I/5<br>International Symposium on Satellite Mapping<br>Technology and Application  | 6 -8 Nov, 2013<br>Nanjing, CHINA            | -  |
| WG IV/5<br>ISPRS WebMGS 2013 & DMGIS 2013<br>Topics: Global Spatial Grid & Cloud-based Services  | 11-12 Nov. 2013<br>Xuzhou, CHINA            | Archives Vol. XL-4/W2                        |
| <b>Joint ISPRS Conference on<br/>Serving Society with Geoinformation<br/>(Geospatial Week 2013)</b><br>WG III/3 - Image Sequence Analysis for Object and<br>Change Detection<br>WG V/3, I/2, I/3, III/2, V/2, VII/7, ICWG I/Va<br>Laser Scanning 2013<br>WG III/4, ICWG III/VII<br>CMRT13 - Object Extraction for 3D City Models, Road<br>Databases and Traffic Monitoring | 11-17 Nov. 2013<br>Antalya, TURKEY          | Archives Vol. XL-7/W2                        |
|  | 11 Nov. 2013<br>Antalya, TURKEY             | Annals Vol. II-3/W2                          |
|  | 11-13 Nov 2013<br>Antalya, TURKEY           | Annals Vol. II-5/W2                          |
|  | 12-13 Nov 2013<br>Antalya, TURKEY           | Annals Vol. II-3/W3                          |
| WG VIII/1, IV/4<br>Geospatial Data for Disaster and Risk Reduction   | 21-22 Nov 2013<br>Hyderabad, INDIA          | -  |
| WG II/2<br>3D GeoInfo 2013 - 8th 3D GeoInfo Conference &<br>WG II/2 Workshop on Advances in Multi-Scale and Multi-<br>Dimensional Modeling and Data Representation   | 27-29 Nov 2013<br>Istanbul, TURKEY          | Archives Vol. XL-2/W2<br>Annals Vol. II-2/W1 |
| ICWG IV/II/VIII<br>ISPRS/IGU/ICA/GSC Joint Workshop<br>Borderlands Modelling and Understanding<br>for Global Sustainability  | 5-6 Dec 2013<br>Beijing, CHINA              | Archives Vol. XL-4/W3                        |
| WG VIII/7<br>Multi Scale Forest Biomass Assessment and<br>Monitoring of Hindu Kush-Himalayan Ecosystem using<br>Geospatial Systems   | 9-10 Dec 2013<br>Kathmandu, NEPAL           | -  |
| TC V<br>Low-Cost 3D – Sensors, Algorithms, Applications  | 10-11 Dec, 2013<br>Berlin, GERMANY          | -  |
| WG IV/7, WG I/2, ICWG II/IV, WG III/2, WG IV/6<br>ISPRS Acquisition and Modelling of Indoor and Enclosed<br>Environments 2013  | 11-13 Dec 2013<br>Cape Town<br>SOUTH AFRICA | Archives Vol. XL-4/W4<br>Annals Vol. II-4/W1 |
| WG VI/2<br>Innovative Learning Tools 2013<br>Strategies for Earth Resources Management   | 20-21 Dec, 2013<br>Ahmedabad, INDIA         | -  |
| ICWG III/I<br>EuroCOW 2014, the European Calibration and Orienta-<br>tion Workshop   | 12-14 Feb, 2014<br>Castelldefels, SPAIN     | Archives Vol. XL-3/W1                        |
| TC IV<br>ISPRS Technical Commission IV Symposium   | 14-16 May, 2014<br>Suzhou, CHINA            | Archives Vol. XL-4<br>Annals Vol. II-4       |
| WG II/3<br>International Workshop on Spatial Analysis and Data<br>Mining (SADM 2014)   | 17-18 May, 2014<br>Wuhan, CHINA             | -  |
| TC VI<br>ISPRS Technical Commission VI Symposium   | 19-21 May, 2014<br>Wuhan, CHINA             | Archives Vol. XL-6<br>Annals Vol. II-6       |
| TC V<br>ISPRS Technical Commission V Symposium   | 23-25 Jun, 2014<br>Riva del Garda, ITALY    | Archives Vol. XL-5<br>Annals Vol. II-5       |
| WG VIII/7<br>International Conference on Intelligent Earth Observing<br>and Applications   | 26 - 27 June, 2014<br>Guilin, CHINA         | -  |
| TC III<br>ISPRS Technical Commission III Symposium   | 5-7 Sep, 2014<br>Zurich, SWITZERLAND        | Archives Vol. XL-3<br>Annals Vol. II-3       |



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|--|---|--|
| TC VII<br>ISPRS Technical Commission VII Symposium   | 29 Sep - 2 Oct, 2014<br>Istanbul, TURKEY    | Archives Vol. XL-7<br>Annals Vol. II-7       |
| TC II<br>ISPRS Technical Commission II Symposium   | 6-8 Oct, 2014<br>Toronto, CANADA            | Archives Vol. XL-2<br>Annals Vol. II-2       |
| WG II/1, WG II/4, ICWG II/IV, WG IV/7<br>The 1st ISPRS International Conference on Geospatial Information Research | 15-17 Nov, 2014<br>Tehran, IRAN             | Archives Vol. XL-2/W3                        |
| TC I<br>ISPRS Technical Commission I Symposium   | 17-20 Nov, 2014<br>Denver, Colorado, USA    | Archives Vol. XL-1<br>Annals Vol. II-1       |
| ICWG I/Va, WG I/3<br>The Second International Conference on Computer Vision in Remote Sensing (CVRS2014)           | 17-20 Nov, 2014<br>Denver, Colorado, USA    | -  |
| TC V<br>Low Cost 3D (LC3D), Sensors, Algorithms, Applications  | 2 - 3 Dec, 2014<br>Berlin, GERMANY          | -  |
| TC VIII<br>ISPRS Technical Commission VIII Symposium   | 9-12 Dec, 2014<br>Hyderabad, INDIA          | Archives Vol. XL-8<br>Annals Vol. II-8       |
| WG V/4, CIPA<br>3D-Arch 2015 – 3D Virtual Reconstruction and Visualization of Complex Architectures                | 25-27 Feb, 2015<br>Avila, SPAIN             | Archives Vol. XL-5/W4                        |
| WG VII/5, VII/7<br>Workshop on Laser Scanning Applications   | 16 Mar, 2015<br>Cologne, GERMANY            | -  |
| TC I, III<br>PIA15+HRIGI15 – Joint ISPRS conference  | 25-27 Mar, 2015<br>Munich, GERMANY          | Archives Vol. XL-3/W2<br>Annals Vol. II-3/W4 |
| WG VIII/5<br>Energy and Geological Applications: Regional Symposium (Asia)   | 28 - 31 Mar, 2015<br>KUWAIT                 | -  |
| TC V<br>CIPA, Underwater 3D Recording and Modeling   | 16-17 Apr, 2015<br>Piano di Sorrento, ITALY | Archives Vol. XL-5/W5                        |
| WG IV/2<br>Global Geospatial Information and Global Land Cover/Land Use Mapping                                    | 21 April, 2015<br>Novosibirsk, RUSSIA       | -  |
| ICWG I/Va, WG I/3<br>The Third International Summer School on Mobile Mapping Technology (MMT 2015 Summer School)   | 26 - 30 April, 2015<br>Xiamen, CHINA        | -  |
| TC VII/3<br>36th International Symposium on Remote Sensing of Environment  | 11-15 May, 2015<br>Berlin, GERMANY          | Archives Vol. XL-7/W3                        |
| WG IV/7, WG V/4<br>Indoor-Outdoor Seamless Modelling, Mapping and Navigation                                       | 21-22 May, 2015<br>Tokyo, JAPAN             | Archives Vol. XL-4/W5                        |
| WG V/5, WG III/3<br>Photogrammetric techniques for video surveillance, biometrics and biomedicine                  | 25-27 May, 2015<br>Moscow, RUSSIA           | Archives Vol. XL-5/W6                        |
| WG II/4<br>ISPRS Workshop on Trust in Spatial Data and Validation of Global Land Cover Mapping                     | 5 - 7 June, 2015<br>Shanghai, CHINA         | -  |
| International Workgroup on Supporting Future Earth with Geo-information  | 9 - 10 June, 2015<br>Beijing, CHINA         | -  |
| WG VI/1, WG VI/2 & WG VI/3<br>ISPRS Workshop of Commission VI 1-3, Advances in Web-based Education Services        | 18-19 June, 2015<br>Berlin, GERMANY         | Archives Vol. XL-6/W1                        |
| WG IV/5<br>WebMGS 2015   | 1-3 July, 2015<br>Sardinia, ITALY           | Archives Vol. XL-4/W7                        |
| ICWG IV/II<br>ISPRS International Workshop on Spatiotemporal Computing   | 13-15 July<br>Fairfax, Virginia, USA        | Annals Vol. II-4/W2                          |

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| WG VII/6<br>International Workshop on Image and Data Fusion   | 21-23 July, 2015<br>Kona, Hawaii, USA      | Archives Vol. XL-7/W4                        |
| ICWG I/Vb<br>ISPRS UAV-g2015  | 30 Aug - 2 Sept, 2015<br>Toronto, CANADA   | Archives Vol. XL-1/W4<br>Annals Vol. II-1/W1 |
| TC V<br>25th International CIPA Symposium 2015  | 31 Aug - 4 Sept, 2015<br>Taipei, TAIWAN    | Archives Vol. XL-5/W7<br>Annals Vol. II-5/W3 |
| WG IV/8<br>Planetary Mapping and Spatial Databases  | 24 - 25 Sept, 2015<br>Berlin, GERMANY      | -  |
| <b>ISPRS Geospatial Week 2015</b><br>LS15 - Laser Scanning 2015<br>ISSDQ15 - The 9th International Symposium on Spatial Data Quality<br>GeoUAV<br>GiD4M - The 10th International Conference on Geo-information for Disaster Management<br>GeoHyper15 - Image spectroscopy – Concepts, Algorithms, and Applications<br>CMRT15 - City Models, Roads and Traffic 2015<br>ISA15 - Image Sequence Analysis 2015<br>GeoBigData15 - Managing, Processing, and Rendering Remotely-Sensed Big Geospatial Data<br>GeoVIS15: Rendering and Cognition with Images and Hybrid Visualizations | 28-30 Sept, 2015, La Grande Motte - FRANCE | Archives Vol. XL-3/W3<br>Annals Vol. II-3/W5 |
|   | 29-30 Sept, 2015, La Grande Motte - FRANCE | Archives Vol. XL-3/W3<br>Annals Vol. II-3/W5 |
|   | 1-2 Oct, 2015, La Grande Motte, FRANCE     | Archives Vol. XL-3/W3                        |
|   | 1-2 Oct, 2015, La Grande Motte, FRANCE     | Archives Vol. XL-3/W3                        |
|   | 1-2 Oct, 2015, La Grande Motte - FRANCE    | Archives Vol. XL-3/W3                        |
|   | 1 - 2 Oct, 2015, La Grande Motte, FRANCE   | Archives Vol. XL-3/W3<br>Annals Vol. II-3/W5 |
|   | 1 Oct, 2015, La Grande Motte - FRANCE      | Annals Vol. II-3/W5                          |
|   | 1-2 Oct, 2015, La Grande Motte - FRANCE    | Archives Vol. XL-3/W3<br>Annals Vol. II-3/W5 |
|   | 1 Oct, 2015, La Grande Motte, FRANCE       | Archives Vol. XL-3/W3<br>Annals Vol. II-3/W5 |
| ISPRS WG II/2<br>ISPRS Joint International Geoinformation Conference  | 28-30 Oct, 2015<br>Kuala Lumpur, MALAYSIA  | Archives Vol. XL-2/W4<br>Annals Vol. II-2/W2 |
| WG I/5<br>PSIVT2015 Workshop - Passive and Active Electro-Optical Sensors for Aerial & Space Imaging  | 24 Nov, 2015<br>Auckland, NZ               | -  |
| ISPRS WG I/4<br>SMPR 2015 - International Conference on Sensors and Models in Photogrammetry and Remote Sensing   | 23-25 Nov<br>Kish Island, IRAN             | Archives Vol. XL-1/W5                        |
| WG IV/4 and FIG Commission 2<br>International Joint Workshop on Strengthening Opportunities for Professional Education and Spatial Data Infrastructure Development  | 25 - 27 Nov, 2015<br>Kathmandu, NEPAL      | -  |
| WG I/5<br>Low Cost 3D (LC3D), Sensors, Algorithms, Applications   | 1 - 5 Dec, 2015<br>Berlin, GERMANY         | -  |
| WG II/8, ICWG IV/II/VIII<br>ISPRS Joint Workshop on "Mobility and Land Cover Change Mapping"  | 5 -6 Dec, 2015<br>Changsha, CHINA          | -  |
| WG IV-3<br>Advances in global DEMs and Tools for assessing their quality, useability and interoperability   | 14 - 16 Dec, 2015<br>TAIWAN                | -  |
| WG VIII/1<br>Geospatial Technology for Disaster Management & Weather Forecasting  | 16-18 Dec, 2015<br>Jaipur, INDIA           | -  |

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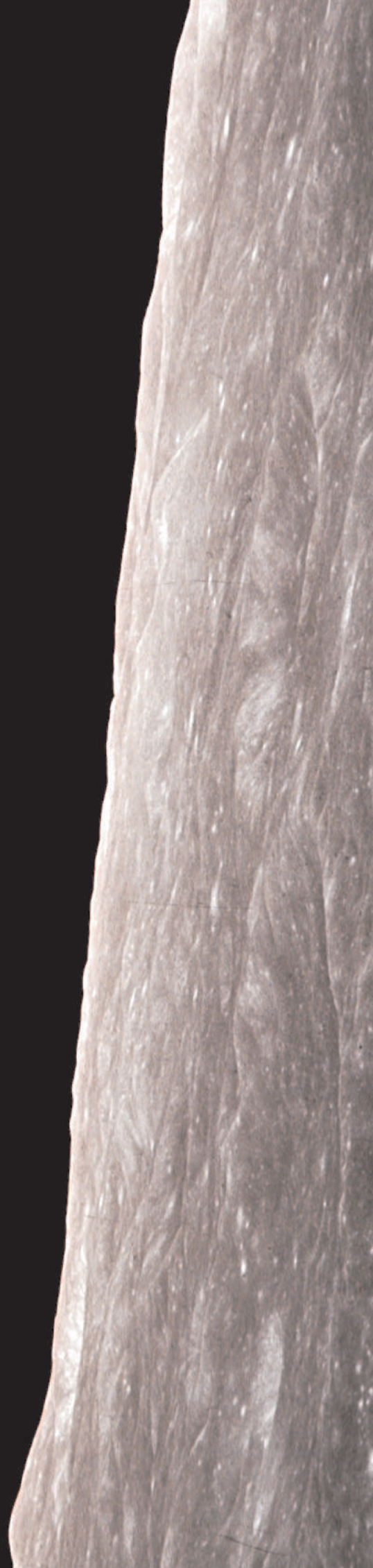
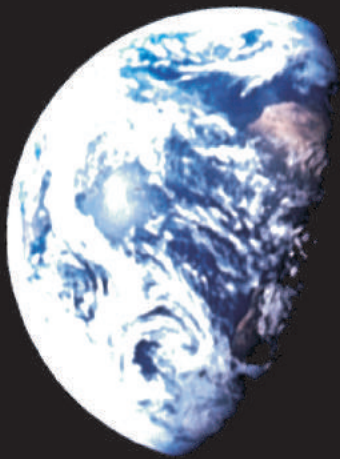
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